Hans Konrad Van Tilburg. THE MARITIME HISTORY AND NAUTICAL ARCHAEOLOGY OF CHINA IN SOUTHEAST ASIA: SONG TO EARLY MING DYNASTIES (960 -- 1435 C.E.) (Under the direction of Dr. Lawrence E. Babits) Department of History, December 1994.

The purpose of this thesis is to serve as an introduction to a 500 year period of the Chinese maritime experience. Much of the long seafaring history of the East remains unknown to Western scholars. The study begins with an historical survey of several centuries of seagoing trade and naval evolution, highlighting traditional navigation patterns and technological developments in China's complex relationship with the Southern Seas. Limiting the study to the Southeast Asian region emphasizes the importance of this area to the Chinese, and helps to concentrate the topic on the era of expansion.

The geographical distribution of related artifact remains and significant maritime events throughout Southeast Asia are then examined. This section combines modern archaeological reports with historical documentation and Chinese navigation charts from the early Ming period. The description of traditional Chinese ships, from contemporaneous reports and modern site investigations, provides clues for future nautical research.

Since this study draws only from sources available in the West, the final section acknowledges some important institutions in China and Southeast Asia currently working on nautical research. Although linguistic, cultural, and geographical barriers impede the transfer of academic knowledge, the future promises greater understanding and opportunities for cooperative investigations of maritime history and nautical archaeology.

THE MARITIME HISTORY AND NAUTICAL ARCHAEOLOGY OF CHINA IN SOUTHEAST ASIA: SONG TO EARLY MING DYNASTIES (960 -- 1435 C.E.)

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Figure 1: Admiral Zheng He (Kong, *Sam Po*, ix.)

Chapter One
Introduction: Chinese Maritime History in Context

Throughout the long span of China's relatively land-oriented history, one period stands out for its exceptional maritime expansion. Between the Song dynasty (960-1279 C.E.) and the early part of the Ming dynasty (1368-1644 C.E.), China's imperial leaders focused their attention overseas.[1] For the four and a half centuries between 1000 and 1440 C.E., China maintained the predominant maritime position throughout the western Pacific and Southeast Asia. Her international trading ports conducted more business than many countries combined. Her navy controlled the domestic seacoast and dominated scores of overseas nations, promoting peaceful tributary relations with the Middle Kingdom. Her admirals sailed more sea miles than had ever been covered before.[2] "Haughty emissaries of the Dragon Throne, armed to the teeth to enforce the imperial will," met little resistance in their missions to ports as distant as the Red Sea and the east coast of Africa.[3] No other country could at that time match China's Asiatic squadron.

This Song to Ming profusion of maritime activity did not arise from a vacuum, but evolved from earlier traditional sea-going occupations in China's maritime provinces, particularly Fujian, Guangdong, and Zhejiang provinces in

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[1]C.E. and B.C.E. (Common Era and Before Common Era), designations used by some in the fields of anthropology and archaeology rather than A.D. and B.C., do not imply any western religious connection and are better suited to descriptions of eastern history.

[2]Phillip Snow, *The Star Raft, China's Encounter with Africa* (New York, 1988), 22.

[3]Ma Huan, *Triumphant Tour of the Ocean's Shores*, trans. J.V.G. Mills (1433; reprint, London, 1970), 1. Mills' classic translation of this important text provides a first-hand impression of the expeditions. Ma Huan, a Muslim from Yunnan (as was Zheng He) acted as interpreter on the third voyage.

Southeastern China. The first mention of oars occurred in 1400 B.C.E. Rafts and ferries were in use by 700 B.C.E., if not earlier. By 140 B.C.E., expeditions carrying silk and gold sailed for Madras. The stern-post rudder appeared no later than 100 C.E. Before the Viking era, Arab ships were arriving in China, and Chinese generals were experimenting with paddle-wheels.[4] The Chinese were the first to use their compass at sea, in 1117 C.E.[5] Before any recorded history, both China and Southeast Asia contributed to the Pacific sailing raft tradition, an advancement which made possible the peopling of the vast Pacific.[6] Many of the tools and techniques invented by Chinese sailors were transmitted to Europe via Arabian merchants.[7] These advancements exemplify the creative abilities of China's native sailors, rather than the accomplishments of the northern dynastic governments. In fact, the story of China's maritime expansion belongs more to the coastal Chinese than to the rest of the nation. The people of the southern maritime provinces have almost always remained relatively independent from the official administration.

Though the natives of Guangdong, Fujian, and Zhejiang provinces made their living on or by the sea, most imperial Chinese governments were more

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[4]This list is from a chronological table assembled by G.R.G. Worcester, *The Junks and Sampans of the Yangtze* (Annapolis, 1971), ix.

[5]Chinese compasses pointed south, the traditional direction of expansion, particularly for the maritime population . Robert Temple, *The Genius of China; 3000 Years of Science, Discovery, and Invention* (New York, 1986), 150.

[6]For more information on the transpacific connection (a topic not covered in this thesis) see Clinton R. Edwards, "Sailing Rafts of Sechura: History and Problems of Origin," *Southwestern Journal of Anthropology*, vol.16 no.3(1960), 368.

[7]These included the rudder, compass, and watertight bulkheads, among others. One reference exists to the possible Chinese claim of invention of the wooden barrel, the basic unit of transport for the world's sailing fleets for hundreds of years. See Vassilios Christides, "The Transmission of Chinese Maritime Technology by the Arabs to Europe," *The American Neptune*, vol.52 no.1(1992), 45.

concerned with China's considerable land-based problems. Droughts, floods, invasions by northern barbarians, and the constant work of maintaining a vast agricultural populace have always been China's official priorities. Maritime activity varied throughout time, its nature fluctuating between legal and illicit, with or without imperial consent. Usually maritime contact with foreign nations, a natural occupation of the coastal populace, was strictly regulated by the imperial authorities. The period from the Song to the early Ming saw official China's most favorable attitude towards oceanic travel. The resulting expansionism makes this period a most productive one for nautical studies.

Increased commercial relations throughout Southeast Asia and along the sea routes to the West also involved military activities. It was only with the cultural and industrial growth of the Song dynasty that a large permanent navy became possible and with the Mongol invasion, inevitable. Warfare among the hills and rivers of southern China necessitated naval strategies. For a period of almost three and a half centuries, a strong navy played a critical role in China's international relations. The Yuan (Mongol) dynasty inherited the original naval framework of the Song, adding aggressive military tasks to the evolving imperial navy. Chinese military control of the sea routes (so important to peaceful trade) culminated during the early Ming dynasty, when Admiral Zheng He organized seven large fleets for journeys across the Indian Ocean. These expeditions are best understood in the context of this whole period of sea-going activity; they represent the technological and overseas climax of China's maritime history. At the end of the early Ming period the imperial government withdrew its support of the naval venture and the institution collapsed.

Some of the important details of this period of Chinese maritime history have been preserved in various official and eyewitness records, but confirmed by

very few archaeological investigations. In fact, maritime China as a subject remains understudied for a variety of reasons. Most history has been written by northern Chinese, not the seafaring communities.[8] Most vessels recorded by Europeans after contact represented northern styles, not southern sea-going designs.[9] Cultural differences between east and west, and particularly the language barrier, have impeded the flow of information. For Western historians and archaeologists with an interest in Asian topics, however, the Southern Song to early Ming period (or more specifically 1000 to 1440 C.E.) represents a fascinating episode, one only slightly understood and filled with questions. UNESCO conferences on topics such as "China's Maritime Silk Route," and recent discoveries of Song vessels in China and Southeast Asia reflect a new interest in the field of maritime studies. Today, nautical archaeologists are just beginning to gain a clearer picture of Asian maritime history before European contact.

Many more questions than answers exist in this field because historical sources are not yet supported by physical evidence. Traditional ports in Thailand, Vietnam, Borneo, the Ryukyus, Malaysia, Sumatra, and Java all served Southeast Asian and the Chinese empires for an extended period of time. Malacca functioned as a virtual overseas naval base for Zheng He's voyages further west. Communities of Chinese were directed to relocate overseas; tributary nations even received ships as grants from the Chinese empire, for the continuation of peaceful trade. Where is the archaeological evidence of this active period? Where are the artifacts from customs houses, repair facilities, and sites of naval battles? Of the

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[8]Some scholars even see merit in the hypothesis that the coastal southern provinces had closer economic ties to Southeast Asia at this time than to continental China. See Robert B. Fox, "The Archaeological Record of Chinese Influences in the Philippines," *Philippine Studies*, vol.15(1967), 43.

[9]George F. Carter, "Chinese Contacts with America: Fu Sang Again," *Anthropological Journal of Canada*, vol.14 no.1(1976), 11.

ships themselves, almost nothing is known. The best approach for the Western nautical archaeologist, faced with such a relatively unknown field, is to gain an historical understanding of the period, gleaning as many clues as possible from the historians and sinologists who have already accomplished so much.

The topic of Chinese maritime history is sufficiently new to the West that a broad perspective, rather than a minute study of individual documents, better serves to place potential investigations in historical context. The historical picture is best understood in light of the modern physical evidence discovered in the region. A synthesis of history and archaeology permeates this study, establishing the methodology for all research work.

Chapter Two
Interdisciplinary Approach

The history of China's intense involvement with the sea carries with it clues, not only for traditional historians constantly searching for elusive primary sources, but also for those who study the artifacts of human behavior. Archaeology is linked to history in such an intricate manner that the connections go far beyond the range of this paper. The format of this work, however, draws upon a synthesis of the two fields; by studying history, the archaeologist prepares for investigations in the field. History aids in the interpretation of material remains. In turn, the interpretation of carefully studied archaeological sites and artifacts helps to fill in many sparsely documented areas of history.

This thesis will first present the historical background of Chinese maritime involvement with Southeast Asia during the Southern Song-early Ming period. These chronological and geographical boundaries limit an otherwise unwieldy topic. This survey is divided into two areas, commercial trade and military control. Zheng He's voyages must be understood in a larger context as the technological climax of the whole period's extraordinary maritime expansion. The voyages represent the most complete example of China's control of Southeast Asian sea routes. It should be kept in mind that an historical approach does not complete the story, rather it sets the stage for further questions. Examining primary, and the many important secondary, historical sources with the intention of gathering clues for archaeological research sheds a new light on old interpretations.

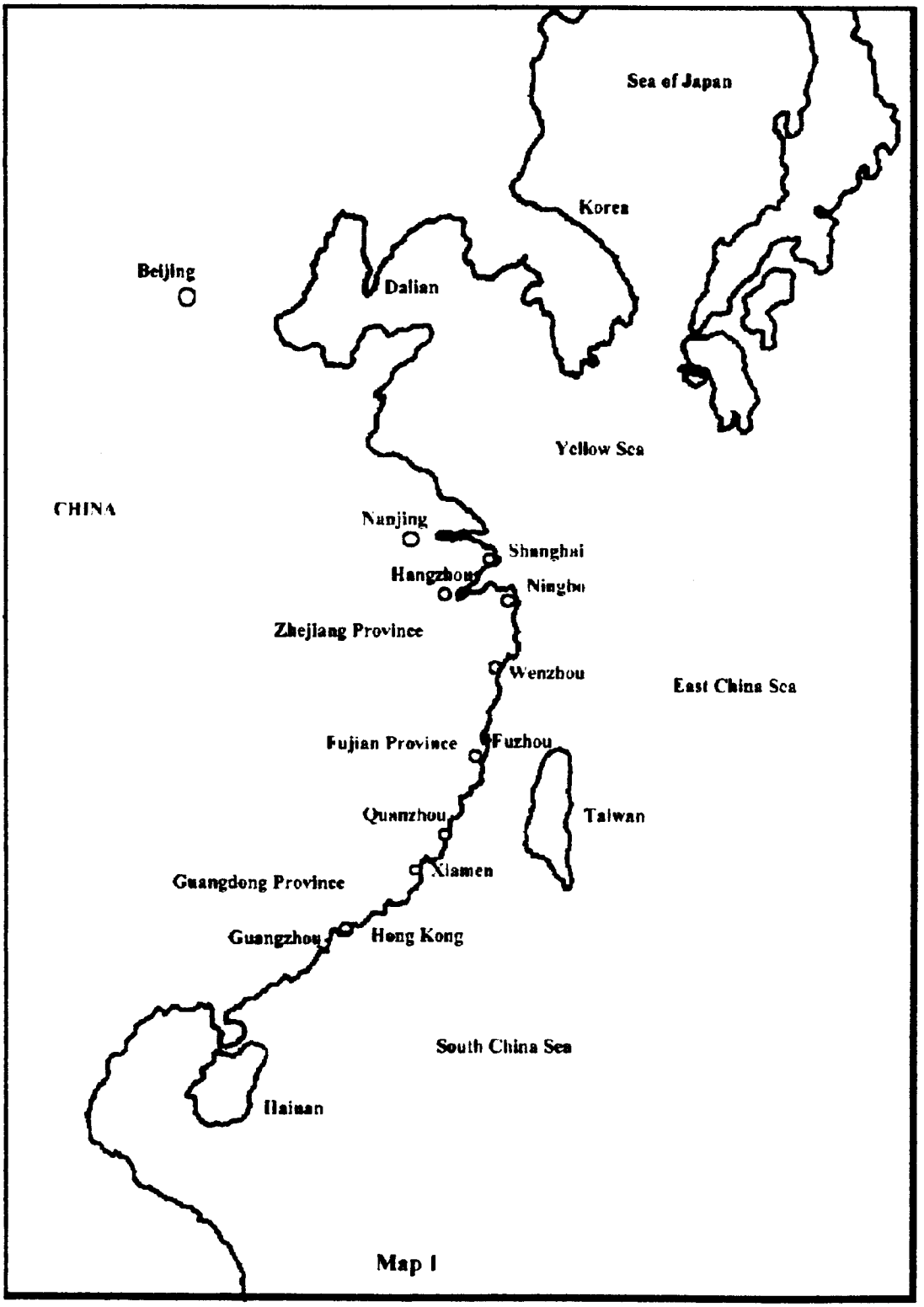
The second part of the thesis presents a concentration of nautical evidence gleaned from historical sources, first by juxtaposing the historical maritime

geography with known related archaeological sites, wet or dry. This approach does not form a survey plan, but does provide a new way of interpreting both historical and archaeological evidence. Second, estimates of what artifacts might be found today, based on documentary evidence, are compared to the few archaeological examples which have been found. Again, historical and archaeological techniques are combined to furnish new conclusions about Chinese maritime expansion in Southeast Asia. The ultimate goal of this section is to present historical and archaeological information in a manner applicable to both fields, the synthesis creating a fresh perspective for both the region's history and future research plans. Ports and other areas of historical significance must be identified; the types of ships, cargoes, and other artifact remains must be estimated.

Finally, as this research is definitely not new to Eastern scholars, part three offers a picture of the structure and institutions already at work in this field, a view of nautical archaeology in East and Southeast Asia. Not only does this help reduce duplication of effort, but it also features the unexpected lesson that much of what western historians and archaeologists take for granted does not necessarily apply to other countries.

This thesis uses an interdisciplinary approach to study a complex, singular topic. If primary and secondary documentary sources for the period of Chinese maritime expansion in Southeast Asia are examined, along with archaeological evidence of the same period, then new correlations beneficial for the interpretation of maritime history and future research should come to light. This synthesis combines the best features of two related fields, history and archaeology; it creates a more complete perspective, one more useful to the future efforts of both

historians and archaeologists than anything either singular approach could produce.


Sea of Japan
Korea
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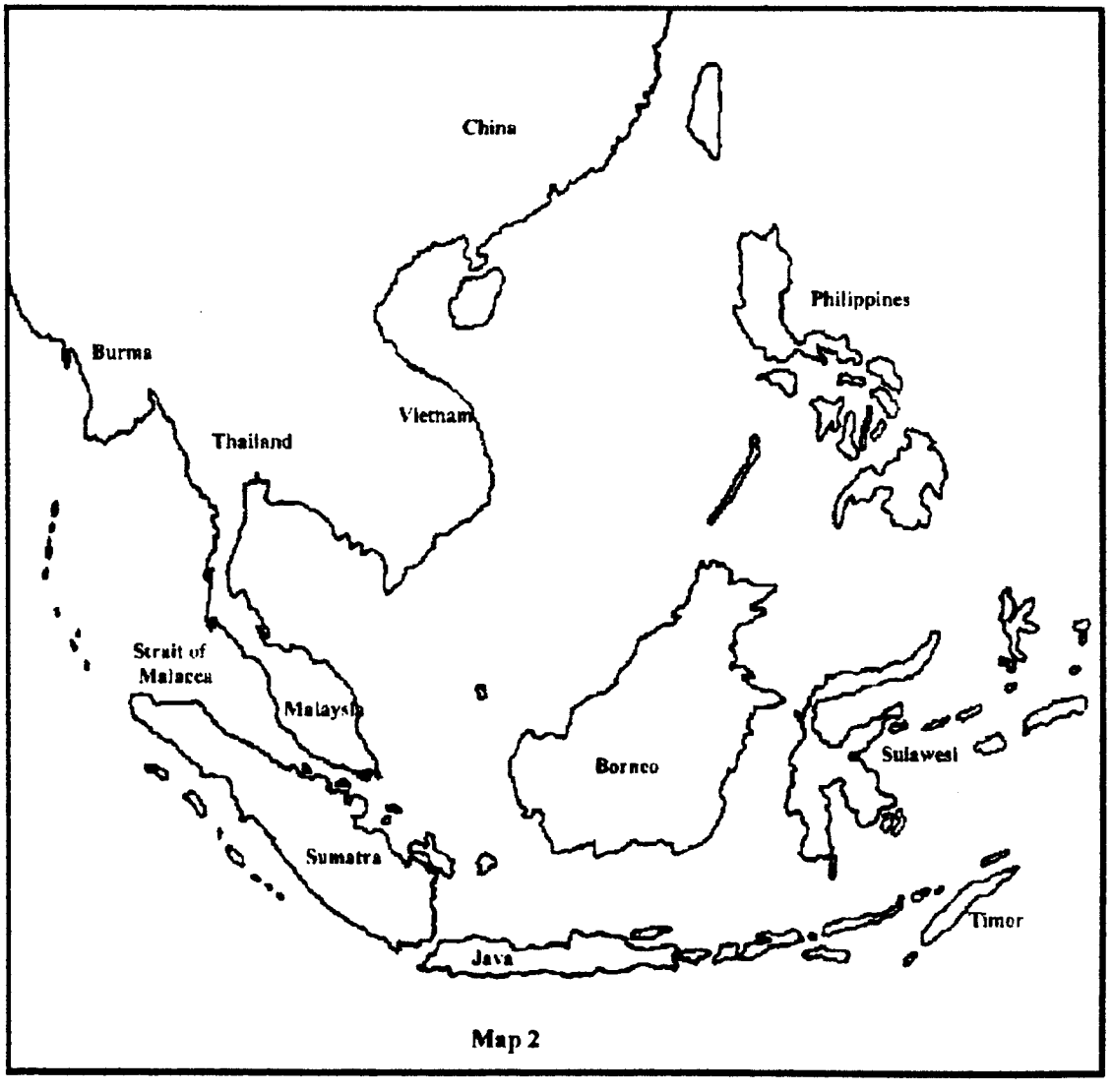
Dalian
Yellow Sea
CHINA
Nanjing
Shanghai
Hangzhou
Ningbo
Zhejiang Province
Wenzhou
East China Sea
Fujian Province
Fuzhou
Quanzhou
Taiwan
Xiamen
Guangdong Province
Guangzhou
Hong Kong
South China Sea
Hainan

Map 1


China
Philippines
Burma
Vietnam
Thailand
Strait of
Malacca
Malaysia
Borneo
Sulawesi
Sumatra
Timor
Java

Map 2

Chapter Three
Commercial Trade -- China and Southeast Asia

Introduction

Unlike other maritime trading powers, the Chinese imperial government did not always support private trade overseas. Economic policy changed drastically over time. Though the Southern Song officials offered incentives to private merchants to increase their business, early Ming policy attempted to ban all private trade, securing the large trade monopolies for government profit. Confucian scorn for commercialism, abhorrence of contact with foreign barbarians, and the low status of merchants in society may have influenced this lack of support. In fact, the vice of trade sometimes seemed more dangerous than contact with any foreign nation. Ming author Chang Hsieh wrote that:

> ...those who make carriages build them in workshops, but when they come forth to the open road, they are already adjusted to the ruts. So it is with good sea-captains. The wings of cicadas make no distinction between one place and another, while even the small scale of a beetle will measure the vast empty spaces. If you treat the barbarian kings like harmless seagulls (i.e. without any evil intentions), then the trough-princes and the crest-sirens will let you pass everywhere riding on the wings (of the wind). Verily the Atlas-tortoise with mountain-islands for its hat is no different from (an ant) carrying a grain of corn. Coming into contact with barbarian peoples you have nothing more to fear than touching the left horn of a snail. The only things one should really be anxious about are the means of mastery of the waves of the sea--and, worst of all dangers, the minds of those avid for profit and greedy of gain.[1]

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[1]Ming author Chang Hsieh from his chapter on navigation, cited in Joseph Needham, *A History of Science and Civilization in China*, vol.V part 7 (London, 1971), 584.

In spite of the state's Confucian prejudice against the merchant class, active trade in the Western Pacific, and especially Southeast Asia, flourished long before the Song period. Chinese ships were reported west of Malaysia as early as the fourth century C.E.[2] By the ninth century, Chinese ceramics appeared as far abroad as Siraf in the Middle East, probably transshipped to Arab merchantmen in Java, Sumatra, or Malaysia. During the Northern Song dynasty (960-1126 C.E.), export trade ceramics spread to the Philippines, Indonesia, and Thailand in great numbers. This proliferation probably indicates a large export trade in silk as well, although archaeological remains of such perishable textiles prove negligible compared to ceramics and lacquer ware.[3] Manufactured goods such as iron cooking pots were also shipped abroad from China, chiefly from foundries near Quanzhou.[4] Traditional Chinese exports consisted of silk textiles, ceramics, iron pots, and copper coins.[5] With a few exceptions, due to economic fluctuations and invasions by foreigners, the whole Song to early Ming period is noted for its greatly increased volume of maritime trade.

This activity had many ramifications for countries in Southeast Asia. The growth of many states depended on the China-based trade through the area.[6] To a

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[2]John S. Guy, *Oriental Trade Ceramics in Southeast Asia, Ninth to Sixteenth Centuries* (Singapore, 1986), 2.

[3]The trade in silk, along what is called today the 'maritime silk road', goes back to a formative period before the Tang dynasty, a much longer scope than this paper. See Chen Yan, "On the Maritime 'Silk Road' and the Cultural Exchange between China and Foreign Countries," in *China and the Maritime Silk Route* (Fujian, 1991), 1.

[4]Hugh Roberts Clark, "Consolidation on the South China Frontier: the Development of Chuan-chou 699-1126," (PhD dissertation, University of Pennsylvania, 1981), 244.

[5]Chang Pin-tsun, "Chinese Maritime Trade: the Case of Sixteenth Century Fukien," (PhD dissertation, Princeton, 1983), 177.

[6]Guy, *Oriental Trade Ceramics*, 5.

certain extent, trade states adopting the tributary relations with China received cultural traits of the Middle Kingdom.[7] The presence of the large naval armadas of the early Ming also had a substantial impact on piracy, a problem almost endemic to Southeast Asia and the South China Seas.[8] The creation of overseas Chinese merchant communities in Southeast Asia received official sanction at least as early as the beginnings of the Ming dynasty and forever changed the demographics and culture of the entire area.[9]

At the same time, the opening of trade had important effects within China. Kilns and centers for export ceramic production rose near the international trading ports.[10] The economic conditions and increased imports created a serious trade deficit for the Middle Kingdom. The desire for foreign goods led to the massive exportation of coins abroad, specie flight. These problems of regulation should be understood in the context of the government's continual inability to control the coastal merchants of China. No less than ten separate edicts between 1160 C.E. and 1265 C.E. attempted to prohibit the export of Chinese coins overseas.[11] Other

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[7]Chang Pin-tsun, "The Evolution of Chinese Thought on Maritime Foreign Trade from the Sixteenth to the Eighteenth Century," *International Journal of Maritime History*, vol.1 no.1(1989), 52. Acceptance of foreign sovereigns and the use of the Chinese calendar was required throughout Southeast Asia. Other signs of cultural infusion included the addition of foreign mountains and rivers into the Chinese records of sacred places.

[8]Xie Fang, "A Brief Account of the Chinese Pirates in the Sixteenth-Seventeenth Centuries and the Silk Road on the Sea," in *China and the Maritime Silk Route* (Fujian, 1991), 46. Note that the Ming Ban (and subsequent decline of the Chinese navy) is often cited as having a direct relation to the rise of Chinese pirates in the sixteenth and seventeenth centuries.

[9]This sociological aspect reflects another research topic, the diaspora of Chinese to overseas communities worldwide. See Chang Pin-tsun, "First Chinese Diaspora in Southeast Asia in the Fifteenth Century," in Roderich Ptak and Dietmar Rottermund (eds), *Emporia, Commodities and Entrepreneurs in Asian Maritime Trade, c. 1400-1750* (Stuttgart, 1991), 13-28.

[10]Guy, *Oriental Trade Ceramics*, 17.

[11]*Ibid.*, 14.

ramifications proved more beneficial. During the Ming expeditions, a school was established for studying the languages of the foreign barbarians.[12]

A. Song Period

Several primary sources offer insight into the maritime commercial trade in China during this period. There are two types of important records which contain the majority of this information: 1) Dynastic records, known as Shi Lu, were compiled for all the recorded dynasties of China. The Song Shi Lu offers the official version of overseas relations. 2) Descriptions of overseas trade left by observers and officials. The first deals mainly with state-sanctioned diplomatic trade with the many tributary countries to the south. The second includes important information on commodities handled by private as well as government tribute trade. More information can be found by correlating the variety of first-hand reports by Fei Xin, Ma Huan, and others. Yet, the fact that commodities were frequently transshipped renders the detailed examination of place/commodity relationships suspect and of questionable value. The area as a whole represents a rich intermingling of international goods from both the east and the west.

Certain scholars regard the proverbial wealth of the Song dynasty as a phenomenon based almost completely on maritime trade.[13] During the Song, private merchants were encouraged to trade with overseas foreigners. Citizens who could lure foreign merchants to China, or who succeeded in large-volume

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[12]J.J.L. Duyvendak, *China's Discovery of Africa* (London, 1949), 30.

[13]This refers to Jitsuzo Kuwabara, as indicated in Paul Wheatley, "Geographical Notes on Some Commodities Involved in Sung Maritime Trade," *Journal of the Malayan Branch of the Royal Asiatic Society*, vol.32 no.2(1959), 24.

trade, were rewarded with grants, titles, and official positions.[14] This policy served to make available more private ships and resources for military defense, as well as increase commercial revenue.[15] As early as 1011 C.E., Shao Ye, the prefect of Guangzhou, excavated a channel for large oceangoing ships. In Fujian province, three harbors (Chuo ling, Yuan you, and Chen tang) were opened either by dredging operations or the widening of rivers, to provide services for merchant ships.[16] Stone piers were constructed at these harbors for the landing of both private and government vessels. Towers on land, built thirty li apart (about ten miles), served as lighthouses and navigation marks.[17]

The structure of official tribute relations also became well established during the Song dynasty. The important position of superintendent of maritime trade was established in 971 C.E. The great coastal ports of Southern China, Ningbo, Hangzhou, Quanzhou, and Guangzhou, increasingly came under the regulation of an organized maritime trade superintendency. This control, however, did not solve the problem of illicit trade or specie flight carried on by smugglers from these large ports.[18] Song customs officials attempted to oversee the trade of enumerated articles among these chosen ports, along with creating the conditions

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[14]Chang Pin-tsun, "Chinese Maritime Trade," 9.

[15]Lo Jung-pang, "Maritime Commerce and its Relation to the Sung Navy," *Journal of the Economic and Social History of the Orient* vol.12 no.2(1969), 77.

[16]*Ibid.*, 70. The Quanzhou vessel discovered near Fa-Shih village lay some hundreds of yards from the remains of a stone pier, built for the facilitation of trade ships.

[17]*Ibid.*, 72. By Ming times, Fujian alone operated 173 such land beacons. Minarets also served in this capacity.

[18]Hugh R. Clark treats this difficult subject of smuggling in "The Politics of Trade and the Establishment of the Quanzhou Trade Superintendency," in *China and the Maritime Silk Route*, (Fujian, 1991), 376-394. In certain respects this attempt at control resembled the English Navigation Acts of a much later period.

for further (taxable) trade. Collection of duties from this trade became an increasingly important source of revenue for the Southern Song dynasty, especially in light of the costs of resisting the northern invasion forces.[19] After 1127 C.E., all tax revenue from ocean-going ships went straight to the military.[20]

Zhao Rugua, the trade superintendent at Quanzhou, wrote an official description of the flourishing commodities import business from Southeast Asia in 1225 C.E. It is from this document that much of what is known about the type of economic contact during the Southern Song dynasty originates. No less than 339 imported items are mentioned in Zhao's document, by far the most important in terms of value and quantity being aromatics (spices and scented woods) and drugs.[21] Cargoes also included more exotic items such as swords from the Middle East, jewels, minerals, rugs, coral, and slaves. It must be remembered that ports in Southeast Asia sometimes served the dual role of supplying and transshipping goods to and from China. If some commodity such as tin is found in association with a wreck site, therefore, it is not a definite indication that the ship was en route from Thailand, the source area for that metal. The major trading states represented in this work, along with principle trade commodities during the Song period are detailed in Table 1.

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[19]J. Kuwabara states that in the early years of the Southern Song, regulation of maritime trade accounted for about a fifth of the total cash revenue of the state. Jitsuzo Kuwabara, "P'u Shou-keng, a Man of the Western Regions, who was the Superintendent of the Trading Ships' Office in Ch'uan-chou towards the End of the Sung Dynasty," *Memoirs of the Research Department of the Toyo Bunko*, vol.2(1928), 3.

[20]Wheatley, "Geographical Notes," 8.

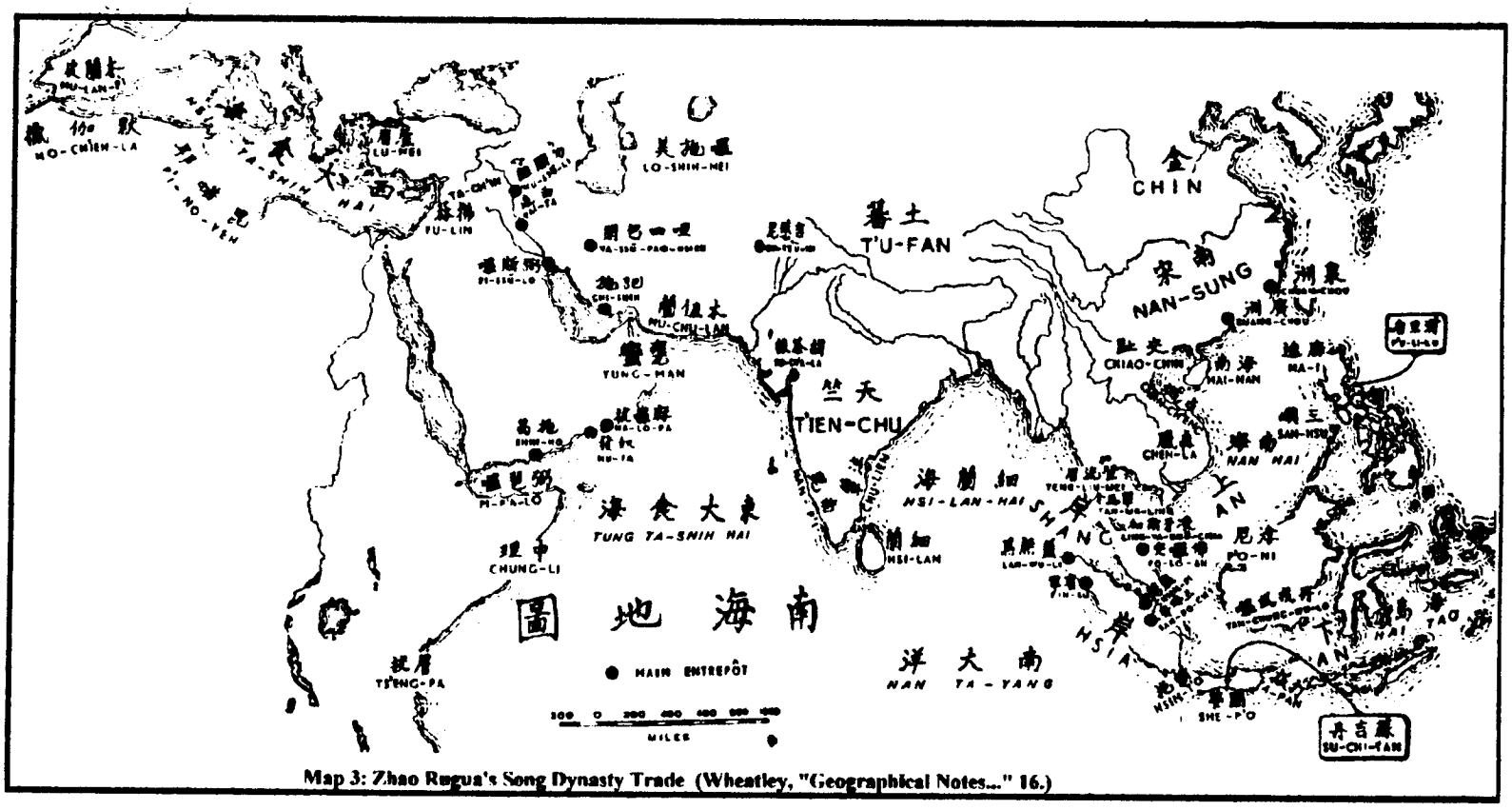
[21]*Ibid.*, 30.

Table 1: Southeast Asian Commodity Examination by Area[22]

Champa (Vietnam)	cotton cloth and kapok gharuwood rhinoceros horn sugar cane ivory
Siam (Thailand)	gharuwood camphor ivory lakawood
Sumatra	frankincense cotton cloth sandal wood gharuwood pearls camphor ivory tin lakawood beeswax
Java	cotton cloth gharuwood sandal wood rhinoceros horn tortoise shell sugar cane camphor lakawood

The general nature of commodity exchange to-and-from China, and whether or not Zhao Rugua's work represents the complete list of all materials, is still under debate. Some consider imports to China at this time to have been necessary items for the general populace; some feel that such goods represent only the demand for

[22]A translation of significant information from Zhao Rugua's official report takes up most of Wheatley's "Geographical Notes," 45-127.



Map 3: Zhao Rugua's Song Dynasty Trade (Wheatley, "Geographical Notes..." 16.)

luxury items by the official class.[23] Certain items, such as metals, both precious and base, have not received complete treatment and may be under represented.[24] All of the trading countries in Southeast Asia, however, feature at least one of the two mainstays of commodity exchange, aromatic wood (gharuwood, sandalwood, and lakawood), among a host of other trade items. Sumatra and Java appear particularly wealthy in the trade of these scented woods, the burning of which is closely associated with religious practices in China.[25] All the other areas in Southeast Asia combined, Borneo, the Sea Islands to the East, Hainan, and the Philippines, do not ship the amounts of trade items offered by either Sumatra or Java. Though this analysis of a majority of the many trade items is obviously generalized and incomplete, it serves, nonetheless, as a representative example of Song dynasty cargoes, and underscores the geographical importance of key areas within Southeast Asia.

B. Yuan Period

The Yuan dynasty featured the active support of commercial contacts even though the Chinese merchants of the south were never completely cooperative with the Mongol rulers.[26] Many aspects of trade during the period, though, remain

[23]Duyvendak was probably the main proponent of the argument for luxurious trifles in his *China's Discovery of Africa*, while Lo Jung-pang and others have given more attention to the economic necessity behind Chinese maritime trade.

[24]Wheatley, "Geographical Notes," 36.

[25]Symbolic of this use, one of the posts on board ships that traveled overseas was "incense burner," charged with keeping the sacrificial scents burning continuously before the altar. Forms of incense clocks also served maritimers as time-keeping devices, setting the periodic watch. Other information on shipboard operations is contained in *Shun Feng Hsiang Sung (Fair Winds for Escort)*.

[26]Morris Rossabi, *Kublai Khan: his Life and Times* (Berkeley, 1988), 187. Like Yongle of the Ming, Khubilai also needed tributary envoys from afar to reinforce his authority over the Chinese people.

vague due to the relative lack of recorded history. Indeed, the Mongol people had not developed a written language until as late as the time of Ghengis Khan in the twelfth century.[27] This lack of documentary sources results in incomplete information concerning certain sections of Mongol trade, control of sea lanes, and shipbuilding.

The commercial emphasis of the maritime expansion period was supported by Khubilai Khan, the Mongol leader destined to finally conquer southern China. The Mongols adopted many maritime features of the earlier Song dynasty.[28] In addition to supporting the Chinese merchant fleets, Yuan officials also allowed seaborne trade to be carried in Arab ships.[29] This reflects a shift in ethnic identification of the foreign rulers. In fact, according to the strict population categorization enforced by the Mongols, Southern Chinese (including the maritime populace) were the most undesirable ethnic group. They were labeled 'Man zi,' an insulting term associated with aboriginal tribesmen.[30] Emphasis in maritime trade became foreign incursions into China, rather than strictly Chinese involvement in overseas commerce.

Though merchant carriers may have changed, the general patterns of Mongol commercial activities differed only slightly, if at all, from those of the

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[27]*Ibid.*, 2. Khubilai's failed attempt at creating a universal language, today called "phags-pa script," does not make the historian's job any easier.

[28]Lo Jung-pang, "The Emergence of China as a Seapower during the Late Sung and Early Yuan Periods." *Far Eastern Quarterly*, 14 (1955), 492.

[29]Charles O. Hucker, *China to 1850: a Short History* (Stanford, 1978), 130.

[30]*Ibid.*, 129. The southern Song proved the most resistant to the Mongol effort, capitulating to Khubilai only after his elder brother, Mongke, was dead. Note that this interpretation differs from Rossabi, who casts the Mongols in a more dependent light. "Khubilai was determined that the Sung Chinese perceive themselves not as conquered people but simply as almost equal citizens or subjects to the Mongols of a unified China..." Rossabi, *Khubilai Khan*, 185.

Song dynasty.[31] Marco Polo and Ibn Battuta both carried accounts of the heights of commerce back to the West. Hundreds of ships crowded the few harbors open to overseas merchants. Archaeological and documentary evidence suggests a commercial connection with ports as far away as Italy during the Yuan dynasty.[32] Archaeological evidence also suggests that the change of China's leadership had both political and economic effects on Southeast Asia. Numerous small trading states, which had previously prospered, collapsed in the fourteenth century.[33] Foreign rule was definitely not without its drawbacks. Some scholars feel that, while the Yuan dynasty proved beneficial for the Mongols and other foreigners, it created no lasting achievements for the Chinese people.[34]

The brief period of Mongol rule had notable effects on the ceramic export trade. Khubilai, recognizing the potential for greater revenue from abroad, began to regulate ceramic production in China.[35] Kilns were supported, registered, and taxed. The freedoms granted to potters led to experimentation with different forms and decorations, a definite break with the confined styles of Song ceramics. The familiar blue-and-white pottery, often associated with the Ming dynasty, actually first appeared during the Yuan, when cobalt-blue glazing first became accessible.[36]

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[31]Roderich Ptak, "China and the Trade in Tortoise Shell (Sung to Ming Periods)," in Roderich Ptak and Dietmar Rottermund (eds), *Emporia, Commodities and Entrepreneurs in Asian Maritime Trade, c. 1400-1750* (Stuttgart, 1991), 211.

[32]Richard C. Rudolph, "A Second Fourteenth Century Italian Tombstone found in Yangchou," *Journal of Oriental Studies*, vol.13 no.2(1975), 133.

[33]Guy, *Oriental Trade Ceramics*, 34.

[34]Hucker, *China to 1850*, 125.

[35]Rossabi, *Khubilai Khan*, 169-170.

[36]*Ibid.*

Yuan styles are generally thought to reflect the increasing influence of an Arabic market rather than previous wares created for Asian distribution.

Even before the Yuan period the great international ports of China, most notably Quanzhou, already supported large communities of foreign merchants. Remains of ancient mosques and tombs testify to the large Islamic population involved in trade on the South China coast. Arab navigators, merchants, and explorers are intricately linked to the history of Chinese maritime development, and this must be seen as especially true during Mongol rule. The account of Pu Shoukeng, a man of Middle Eastern descent and trade superintendent of Quanzhou following Zhao Rugua, represents the best example of the accomplishments possible for foreign merchants in China during the Song-Yuan period.[37] Pu, with a fleet of more than eighty large trade ships, turned his forces over to the Mongols rather than defend the collapsing Southern Song dynasty.[38]

1. Trade at Sea

Few details are known concerning the actual operation of ships at sea during the Song to early Ming period. What little information that has come to the west is derived basically from two sources: *Shun Feng Hsiang Sung (Fair Winds for Escort)*, a Song era pilots' manual, and the *Wu Pei Chi* map, which includes navigational data.[39] The usefulness of sailing directions, rutters, was well known in imperial China.

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[37]For more on this influential foreigner, Kuwabara, "P'u Shou-keng."

[38]Lo Jung-pang, "Maritime Commerce," 98.

[39]Portions of this document appear in translation in dissertations and articles related to Chinese navigation. Chang Pin-tsun, "Chinese Maritime Trade," 329-330, and W.Z. Mulder, "The Wu Pei Chih Charts," *T'oung Pao*, vol. 37 (1944), 1-4.

> People have said that there are *chen-ching* used for navigation...In previous days the rate of shipwrecks was about 20-30% in sea voyages. Gradually people have become used to navigation. Now ships can criss-cross the seas without much trouble, as if they were sailing on calm waters. Such was the expertise achieved by coastal people, in the pursuit of profits.[40]

Officers ranked in similar manner to their Western counterparts controlled the vessel. A mate acted as the captain's mouthpiece; a purser took charge of papers and valuables. A fire chief attended the compass. Helmsmen manned the tiller, and a boatswain oversaw the masts and booms. An armorer had charge of all weapons. Anchormen cared for the large stone anchors. Oarsmen, cooks, and small boat operators were also onboard. An incense keeper had the duty of maintaining the votive incense at all hours. On board, ships maintained a small altar of three gods: Kuan Yu (war god), Chou Shen (the ship's god), and Tian Fei (a deity popular with sailors). Conditions at sea were similar to those experienced by other contemporary mariners; no fresh water was available for bathing, and tropical diseases and a lack of fresh food must have made health a critical issue.

Before departure, and following the completion of a voyage, crews regularly offered sacrifices and prayers at the temple of Tian Fei.[41] Officials paid attention to the necessity of sacrificing to the deities of the winds.[42] Ships typically sailed in the early morning, with the entire complement rising daily

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[40]Tang Shun-chih, sixteenth century author, cited in Chang Pin-tsun "Chinese maritime Trade," 213.

[41]This from manuals like the *Shun Feng*, and also confirmed by the early Ming dynasty stele's erected by Zheng He. Tien Fei is, today, still popular with sailors and overseas Chinese. Complete translation of stele in appendix I.

[42]Yu Lu, *South China in the 12th Century: a translation of Lu Yu's travel diaries, July 3-Dec. 6, 1170* (Hong Kong, 1981), 112-113.

before 5:00 A.M. for ritual worship. Homage to the goddess of Chinese mariners is repeated on several stone inscriptions of the early Ming dynasty.

> The majestic miraculous power of the goddess the Celestial Spouse [Tian Fei], to whom by Imperial command the title has been conferred of "Protector of the country and defender of the people whose miraculous power manifestly answers (prayers) and whose vast benevolence saves universally," is widely spread over the great sea and her virtuous achievements have been recorded in a most honourable manner in the Bureau of Sacrificial Worship.[43]

C. Early Ming Period

With the re-establishment of a native dynasty following the period of foreign rule, the tendency to emphasize moral and ethical attributes resulted in conservative and traditional government.[44] The trade superintendency, so beneficial to Song dynasty private merchants, became specifically involved only with official tribute missions.[45] Following the Song and Yuan dynasties, the Ming government attempted to ban private overseas trade and establish a monopoly in order for the court to better control all imports, revenue, and foreign contact. The number of ports open to foreigners declined.[46] Private maritime trade, never

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[43]Stele translation, J.J.L. Duyvendak, "The True Dates of the Chinese Maritime Expeditions in the Early 15th Century," *T'oung Pao*, vol.34(1938), 344.

[44]Chang Pin-tsun, "The Evolution of Chinese Thought," 52-53. For instance, maritime trade became a function of the Ministry of Rites, rather than the Ministry of Revenue.

[45]Chang Pin-tsun, "Chinese Maritime Trade," 18.

[46]*Ibid.*, 10. Two more ports as stations for tribute trade were opened in the 1420's, one in Yunnan and one in Vietnam. These additional stations reflect the political nature of tribute business (enhancing control of the southwestern territories), rather than a relaxation of the strict control of trade. For more on the Chinese conquest of the southern states, see A.B. Woodside, "Early Ming Expansionism (1406-1427): China's Abortive Conquest of Vietnam," in *Papers on China* (Cambridge, 1963), 1-37.

completely controlled during any point in China's history, became synonymous with smuggling.[47] The Ming dynastic record, the Ming Shi Lu, presents a highly organized picture of the imperial tribute trade system in Southeast Asia at its most official stage of development.

Tribute from vassal states arrived in China only on certain occasions: Chinese New Year, the emperor's birthday, and the birthday of the heir apparent.[48] Regulations also specifically controlled the ports of entry, number of ships and crews, and types of cargoes.[49] Official tribute parties traveled to the capital, where they received "rewards." Non-tribute goods could only be traded at the Hostelry for Foreign Envoys at the capital, or at the offices of the maritime superintendency at the specific ports of entry.[50] Each of the three open international ports dealt with trade from specific areas: Ningbo handled Japan, Quanzhou the Ryukyus, and Guangzhou all of Southeast Asia.[51] Each maintained government stations for these official transactions (termed "Station to Calm Visitors from Afar, Station to Receive Visitors from Afar," and "Station to Cherish Visitors from Afar," respectively).[52] Missions violating these regulations received punishment.[53]

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[47]For more information on smuggling, see Chan Cheung, "The Smuggling Trade Between China and Southeast Asia during the Ming Dynasty," in F.S. Drake (ed), *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region* (Hong Kong, 1967), 223-227.

[48]Chang Pin-tsun , "The Evolution of Chinese Thought," 52-53.

[49]*Ibid.*

[50]*Ibid.*

[51]The Ryukyus at this time, and the port of Naha, represented a fast growing transshipping power, thus of much more importance than any resource produced from its own small geographical area. See Richard Pearson, "The Ryukyus," *Asian Perspectives*, vol.15 no.2(1972), 184-196.

[52]Chang Pin-tsun, "Chinese Maritime Trade," 20.

[53]Wang Yi T'ung, *Official Relations between China and Japan, 1368-1549* (Cambridge, 1953), 37.

Table 2: Import Commodities by Chinese Port[54]

Ningbo (with Japan)	swords spears armor gloves shoulder and leg covers horse armor saddles bridles shields fans incense burners gold silver vessels
Quanzhou (with Ryukyus)	short-legged horses[55] sulfur sapanwood (transshipped) pepper (transshipped)
Guangzhou (with Southeast Asia)	pepper sapan wood tin (for bronze) ivory sandal wood incense wood cloves aloes wood putchuck incense rhinoceros horn (medical) shark skins otter skins

The difference in commodities between Table 2 and Table 1 is a reflection of the extreme variety of products available in Southeast Asia.

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[54]Chang Pin-tsun, "Chinese Maritime Trade," 172-3.

[55]These types were bred in the Ryukyus and proved useful particularly in the mountainous regions of Fujian and the southwestern areas.

Chinese envoys who went abroad had to abide by certain strict rules. The first Ming emperor initiated a system to keep track of overseas Chinese. Tallies (or passports), received by envoys from the court, were checked at stations in Siam (Thailand), Champa, and Cambodia, presumably to make sure no one escaped. Persons without tallies were liable to arrest and forcible return to China.[56]

Diplomatic missions to and from tributary nations were clearly recorded in the Ming Shi Lu. These included: Champa (central Vietnam), modern-day Cambodia, Siam, Malacca, Sumatra, Java, and Brunei.[57] An analysis of mission frequencies highlights these areas of important maritime activity.

Table 3: Tribute Missions 1402-1424[58]

	from China	**to China**
Champa	14	18
Cambodia	3	7
Siam	11	21
Malacca	11	12
Sumatra	11	11
Java	9	17
Brunei	3	9

[56]Wang Yi-T'ung, *Official Relations between China and Japan*, 38. How these stations were run, and by whom, remains unclear.

[57]List of areas compiled from the *Ming Shi Lu* as presented in Wang Gungwu, *Community and Nation: Essays on Southeast Asia and the Chinese* (Singapore, 1981), 74. Diplomatic missions to Northern Vietnam are not recorded, the area having become (temporarilty) a part of China during the early Ming dynasty.

[58]Wang Gungwu, "Early Ming relations with Southeast Asia: a Background Essay," in J.K. Fairbank (ed), *The Chinese World Order* (Cambridge, 1968), 58.

As in the earlier Song dynasty, it proved impossible for the Ming authorities to completely halt the private merchants and their smuggling operations. As with mariners the world over, though, these illegal activities left few records and are nearly impossible to investigate through documentary sources alone. Outlets for native products, as well as demands for Southeast Asian goods, never ceased to be important factors in Chinese maritime trade. Chinese coins continued to be used as a medium of exchange throughout the states to the south.[59] The Ming Shi Lu, records a rare message from the King of Champa informing Zhu Yuanzhang, the first emperor of the Ming dynasty, of the capture of twenty Chinese junks filled with smuggled sapanwood.[60] The number of sailors who continued to evade the maritime regulation may never be known.

Reducing all trade to official tribute missions also meant that greater amounts of smuggling and illicit transactions accompanied the diplomatic envoys to the Middle Kingdom. An imperial edict of 1381 C.E. specifically forbade Java and other Southeast Asian states from taking advantage of their diplomatic privilege to conduct illegal trade.[61] The Javanese seemed particularly apt to take advantage of their hosts; even the personal behavior of their envoys seemed deplorable to the Chinese.[62] After 1424 C.E., Sino-Javanese relations went into a decline.

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[59]Chan Cheung, "The Smuggling Trade," 225.

[60]Guy, *Oriental Trade Ceramics*, 31.

[61]Chiu Ling Yeong, "Sino-Javanese relations in the Early Ming Period," in F.S. Drake (ed). *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region* (Hong Kong, 1967), 215.

[62]*Ibid.*, 219.

The re-establishment of native Chinese government following the Yuan dynasty coincided with an important change in trade routes and policy.[63] In 1408 C.E., for reasons which still remain unclear, sea routes through Southeast Asia changed. Previously, during the Yuan dynasty, sailing directions focused on two major itineraries: the western route brought the great fleets through Southeast Asia to the Straits of Malacca and beyond. The eastern route traveled down the Philippine Islands, past the north coast of Borneo, Sulawesi and the Moluccas, as far east as Timor, and then west, terminating at Java.[64] When Java was officially moved to the western route in 1408 C.E. (a type of economic sanction?), the less important sites on the old eastern route suffered from a lack of trade. This shift is reflected in archaeological evidence from ceramic sites in Southeast Asia.[65]

First-hand accounts from the early Ming dynasty portray the trading areas in the South China Seas as rich entrepots for goods of all kinds, and provide details on the types of commodities exchanged. Wang Ta yuan's *Tao i chih lio (Description of the Barbarians of the Isles)*, a comprehensive description of 99 important foreign locations, was written in 1349 C.E.[66] The best known of these travel reports, however, is Ma Huan's *Ying Yai Sheng Lan (Triumphant Tour of the Ocean's Shores)*, written in 1433.[67] Ma Huan was one of the interpreters on the Ming treasure ships under the command of Admiral Zheng He. He systematically

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[63]And this may account for some of the differences in the lists of important commodities during separate periods.

[64]Guy, *Oriental Trade Ceramics*, 29.

[65]*Ibid.*

[66]Translations of sources such as these are found in W.P. Groeneveldt, *Notes on the Malay Archipelago and Malacca compiled from Chinese Sources* (Batavia, 1876).

[67]Ma Huan, *Triumphant Tour of the Ocean's Shores*, cited in chapter one.

described the geography, products, and people of all the countries visited. Fei Xin, a soldier drafted into the fleet from a coastal garrison, also contributed an account known as the *Hsing Ch'a Sheng Lan (General Account of the Ocean's Shores)*.[68] The formal tone of such documents, the long descriptions of trade goods and foreign peoples, reflects the Chinese priority of commerce and, at the same time, deeply held Confucian attitudes towards foreigners, a seemingly unlikely partnership. The Ming Shi Lu offers, along with Zheng He's biography, the official version of events and trade relations.

Trade goods during the early Ming reflect the same concern with aromatic woods, drugs, and the traditional "luxury" items long associated with Southeast Asia's resources and manufactured goods. Rare animals from the Near East also arrived at the emperor's court. A giraffe stood to the east of the emperor's throne on all auspicious occasions.[69] Additionally, scholars have paid attention to the creation of the cotton industry in China and the massive imports of pepper during the early Ming, both associated with Zheng He's voyages.[70] By the fifteenth century, the average annual amount of pepper imported to China almost equaled the total amount imported into Europe between 1600 and 1650.[71]

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[68]Translations appear in Groeneveldt, *Notes on the Malay Archipelago*. For additional information on Fei Xin, see L.C. Goodrich and Chao Ying Fang (eds), *Dictionary of Ming Biography, 1368-1644* (New York, 1976), 440.

[69]Snow, *The Star Raft*, 23-24. The transportation of giraffes to China has been the specific subject of several scattered articles.

[70]For cotton, see Haraprasad Ray, "Bengal's Textile products Involved in Ming Trade during Cheng Ho's Voyages to the Indian Ocean and Identification of the hitherto Undeciphered Textiles," in Ptak and Rottermund, *Emporia, Commodities and Entrepreneurs*, 91; concerning pepper, see T'ien Ju-k'ang. "Zheng He's Voyages and the Distribution of Pepper in China," *Journal of the Royal Asiatic Society*, no. 2 (1981), 186-197.

[71]T'ien Ju-kang, "Cheng Ho's Voyages and the Distribution of Pepper," 187.

The long-awaited resumption in abundant maritime trade, so beneficial to Southeast Asian states during the Song period, failed to materialize under the Ming dynasty. Official tribute missions never reached the level of economic exchange accomplished by the private merchants of the Song, and the Ming Ban of the mid-fifteenth century quickly ended what trade had been resumed. The "Code of the Great Ming" represents the ultimate form of imperial economic control.

> The Principle criminal, official and commoner alike, guilty of the following violations -- building illegal large ships with more than two masts, carrying forbidden goods to the sea, going to trade in foreign countries, secretly contacting pirates and plotting to group together, acting as their guide or plundering lawful people--is to be executed, and his entire family are to be banished to the frontier to serve with the Military Guards. If he merely charters ships to the seafarers and shares the foreign goods, or if he, though building no ships, contacts the seafarers and secretly purchases foreign goods, he is to be banished to the frontier to serve in the Military Guards. Those who seek out the seafarers and privately trade in foreign goods, if the quantity of aromatic woods and pepper traded exceeds one thousand catties, are to be banished to serve at the frontier military Guards.[72]

Conclusions

Trade throughout the period of maritime expansion proved both beneficial and problematic to the imperial authorities. Revenue from overseas contacts supported a significant portion of state expenditures, particularly during the Southern Song dynasty. Control of this foreign contact and the independent-minded southern Chinese, on the other hand, consistently eluded the efforts of

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[72]Woodside, "Early Ming Expansion," 49. Example is from later code, but reflects the same constrictions on trade as the official stance of 1370.

government regulation. Ultimately, the need for a stable coastal border outweighed the benefits of seagoing trade from the perspective of the later Ming emperors.

Chapter Four
Military Control of Sea Routes

Introduction

Though the commercial and military aspects of Chinese maritime expansion cannot truly be separated, the two are divided here into different categories for clarity. A better term for the type of armed pacification of tributary vassals and sea robbers might be "coercive diplomacy." Aggressive enough when the situation demanded, neither Chinese dynasty during this period matched the military audacity of the Mongol era; neither attempted an armed invasion of Japan. The stated intentions of early Ming policy, one of the most autocratic periods of Chinese authority precluded invasions of foreign powers.

> Overseas foreign countries like An-nam (Vietnam), Champa, Korea, Siam, Liu-ch'iu (Ryukyus), Western Ocean (South India) and Eastern Ocean (Japan) and the various small countries of the southern man ('barbarians') are separated from us by mountains and seas and far away in a corner. Their lands would not produce enough for us to maintain them; their people would not usefully serve us if incorporated. If they were so unrealistic as to disturb our borders, it would be unfortunate for them. If they gave us no trouble and we moved troops to fight them unnecessarily, it would be unfortunate for us. I am concerned that future generations might abuse China's wealth and power and covet the military glories of the moment to send armies into the field without reason and cause losses of life. May they be sharply reminded that this is forbidden. As for the *hu* and *jung* barbarians who threaten China in the North and the West, they are always a danger along our frontiers. Good generals must be picked and soldiers trained to prepare carefully against them. [Followed by a list of fifteen overseas countries not to be attacked.][1]

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[1]Zhu Yuanzhang, founder of the Ming dynasty, as cited in Chang Pin-tsun, "Chinese Maritime Trade," 14.

Zhu Di, the Yongle emperor, proved, however, to be the most militant of China's native rulers. Besides engaging in numerous forays against the Mongols north of the Great Wall, and occupying Vietnam, it was during his reign that the majority of the Ming dynasty treasure fleet expeditions took place. Zheng He's famous "star raft" voyages were the strongest expression of Chinese control of the sea routes through Southeast Asia.

A. Song Period

The development of China's ocean-going navy dates back to the Song dynasty which established certain basic trends within the Chinese military. At the beginning of the twelfth-century, several important social and environmental factors converged, providing the impetus for creating a permanent navy.[2] China experienced a series of natural disasters and foreign invasions in the northwest which enhanced migration to the southeastern coastal provinces. Subsequent military defeats spurred a willingness to strengthen what were previously only provincial units of water-borne transport. In addition, China's maritime provinces offered what Admiral Mahan has termed 'elements of sea power,' such as natural harbors, timber-clad mountains, and a skilled maritime population already involved in coastal fishing and ocean/river trade.[3] Fujian's southeast border, for instance, provides a deeply indented, precipitous coast, strewn with islands and numerous excellent harbors and sheltered bays. Nearby resources such as the

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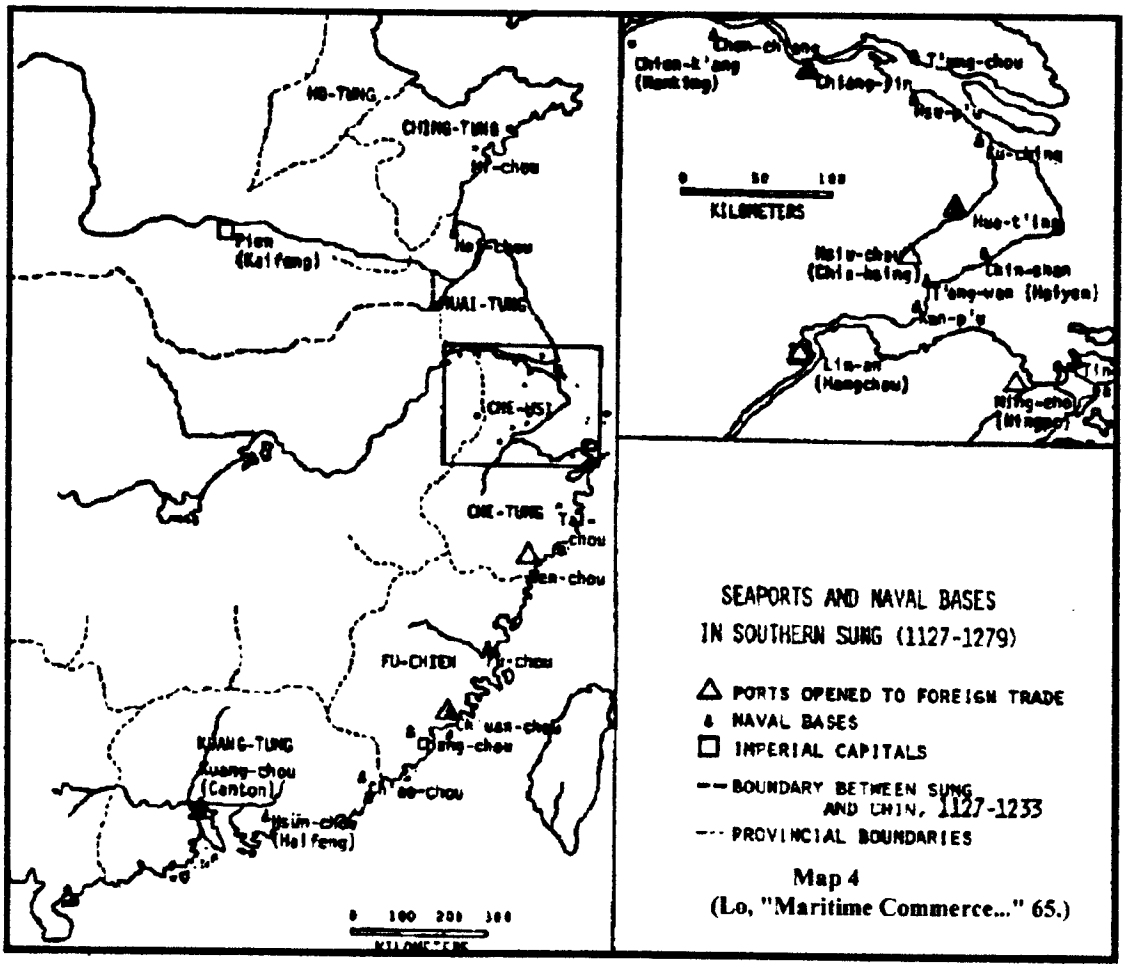
[2]Lo Jung-pang . "The Emergence of China," 489.

[3]*Ibid.*, 494. Imperial attitudes toward the relatively independent maritime provinces usually alternated between extremes of support and subjugation. Many shipwrights from these areas, during less supportive periods, fled to Borneo and other overseas locations.



Map 4
(Lo, "Maritime Commerce..." 65.)

smelting industry close to Quanzhou precipitated the crossroads of advanced technology and transportation (shipbuilding) center.[4]

By 1237 the Song navy consisted of twenty squadrons and 52,000 men based near the entrance of the Yangtze river. Additional resources could be drawn from a large merchant marine and maritime population trained in seafaring and naval warfare.[5] War with the Chin empire (proto-Manchurian peoples) had left the Song dynasty with an efficient navy, useful against coastal pirates.[6] Drawing resources from the coastal provinces for strictly naval operations initially worked well for the Song government. The decades between 1164 and 1204 were the high points of the Song navy.[7] As the southern forces collapsed before the Mongol invasion, however, merchants, increasingly under pressure from the revenue-poor Song court, grew less than generous with their resources.[8]

B. Yuan Period

The Yuan dynasty continued to support the large permanent navy, taking possession of it almost intact from the Southern Song. The Mongols adapted to what was, for them, a completely foreign mode of warfare and immediately proceeded to enhance naval technologies. A large shipbuilding program required an army of 17,000 men to fell trees in the mountains of Jehol.[9] Unlike the Song's

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[4]Chang Pin-tsun, "Chinese Maritime Trade," 125.

[5]Lo Jung-pang, The Emergence of China,", 491.

[6]Lo Jung-pang, "Maritime Commerce," 76.

[7]*Ibid.*, 91.

[8]*Ibid.*, 94-95.

[9]Lo Jung-pang, "The Emergence of China," 493. Both diplomatic expeditions and shipbuilding were later referred to as eunuch-directed activities.

defensive orientation, the Yuan navy became an instrument of long-range imperial aggression. Armadas sent to Japan, Champa, and Java reflect militaristic, not just commercial, relations. To ports such as Tuban in Java, the entrepot for the Kingdom of Majapahit, the Mongols in 1292 C.E. sent punitive expeditions, not trade missions.[10] These massive and expensive naval ventures during the late 1270's and afterwards occured during the decline of Mongol authority in Asia.[11]

Attempted invasions of Japan employed thousands of ships at a time.[12] In 1274 C.E. 15,000 Mongol, Chinese, and Jurchen soldiers and 6-8,000 Korean troops along with 7,000 Korean sailors set out for Japan on board 300 large ships and 4-500 smaller vessels.[13] The military effort strained the Korean economy. The expedition was defeated in part by the famed kamikaze wind. The second invasion attempt in late 1281 C.E. again employed fleets raised in both Korea and China.[14] Chinese and Korean troops totaling 50,000 plus 15,000 sailors set sail from Korea on 900 ships. They were to link up in Japan with 100,000 Chinese troops transported from Quanzhou.[15] Portions of the fleet landed north of the prepared Japanese defenses at Hakata Bay, but, during months of fighting, proved

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[10]Guy, *Oriental Trade Ceramics*, 32.

[11]Rossabi, *Khubilai Khan*, 220.

[12]Takahito Inoue's masters thesis at Texas A&M University, "A Nautical Archaeological Study of Kublai Khan's Fleets," (College Station, 1991) features a summary of what few archaeological investigations have so far been attempted of the Khan's fleets at Hakata Bay, Japan.

[13]Rossabi, *Khubilai Khan*, 102.

[14]Inoue, "A Nautical Archaeological Study." For other details of the invasion and the modern archaeological investigation, plus a few pictures, refer to Torao Mozai, "The Lost Fleet of Kublai Khan," *National Geographic*, November (1982), 634-649.

[15]Rossabi, *Khubilai Khan*, 212.

unable to defeat the entrenched enemy. Again, weather may have played a pivotal role in the outcome.

> In the fifth month the army assembled at Ssu-ming and then boarded the ships going in the northwesterly direction. The staff and commanders were scattered in different ships; as a result orders and commands could not be heard. Those who had a late start caught up in south Korea with the vanguard, which had not proceeded any further on account of the typhoon and the loss of a guide. In the seventh month all ships reached the Chu Island [Cheju Do]. Assaulted by hail, rainstorms, and a strong gale, the ships could not moor. Most were dashed to pieces by the raging waves. Fortunately my ship survived, but it drifted for some time among Korean coastal islands. I was taken ill: having lost all the hair on my head, I came home just a bag of bones.[16]

A third attempt was proposed for 1283 C.E., but the burden on Chinese and Korean resources proved unrealistic and the plans were aborted.[17]

Mongol fleets were also sent to neighboring Champa (mid-Vietnam) and Tonkin (Northern Vietnam). The missions were meant to reaffirm the status of these countries as tributary vassal states to the Mongol overlords. In 1281 C.E., the Khan sent Sodu, the trade superintendant of Guangzhou, to Vijaya in Champa with a force of 5,000 troops and 100 ships. On land the expedition was ambushed and beaten through guerilla-style warfare.[18] Apparently the Mongols never adapted to the different environmental conditions of the southern territories.

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[16]This is the brief (and rare) account of Sung Wu, one of the participants of the Mongol invasion of Japan in 1281 C.E., as cited in Wu Pei-yi , *The Confucian's Progress* (Princeton, 1990), 10.

[17]Rossabi, *Khubilai Khan*, 212.

[18]*Ibid.*, 216.

In 1292 C.E. yet another force of 1,000 ships and 20,000 troops with a year's supply of grain sailed against Tuban in Java.[19] The event was prompted by Java's refusal to submit to the Khan's authority.[20] Unlucky weather again hampered the journey; a portion of the fleet was driven ashore onto Belitung island in the Java Sea.[21] After repairing the fleet, the expedition continued. Once at their destination of Tuban the Mongols initially fared better. The operation featured combined land and sea tactics; half the troops were ashore supported by cavalry, the other half were mobile in fast boats. Later, the Mongols became involved in the duplicity of the Javanese power struggle, and were forced to retreat to their ships, suffering great loss of prestige.

A Mongol fleet landed at Palembang in Sumatra in 1309 C.E.[22] Kublai Khan also sent envoys to Ceylon (modern Sri Lanka), an important center for inter-Asian and international trade.[23] The Chinese had long expressed interest in certain Buddhist relics held by the Sinhalese throne. This expedition, though, might be better understood in the light of geopolitical power and the enormous Mongol empire. Ceylon was a very important trade center for the Indian Ocean. None of these military exploits seem to be recorded in as much detail as the later Ming voyages.

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[19]*Yuan Dynastic Histories* Book 210, as quoted in Groenveldt, *Notes on the Malay Archipelago*, 22-23.

[20]Rossabi, *Khubilai Khan*, 219. Apparently, the Khan's envoy to Java in 1289 had his face branded in reply.

[21]Groeneveldt, *Notes on the Malay Archipelago*, 78. These events were recorded by Fei Xin.

[22]O.W. Wolters, "Landfall on the Palembang Coast in Medieval Times," *Indonesia*, no.20(1975), 4.

[23]K.M. de Silva, *A History of Sri Lanka* (London, 1981), 87.

C. Early Ming Period

Zhu Yuanzhang, founder of the Ming dynasty inherited a large and growing navy with more than 200 years of experience, featuring specialized tactics, ships, weapons, and trained marines. Effective use of the Ming fleet decided the outcome of Zhu Yuanzhang's rise to power, as exemplified in the 1363 inland naval campaign at Poyang Lake.[24] Several other naval engagements also contributed to the Ming victory over the Mongols. Following the establishment of the dynasty, Zhu Di, the fourth of Zhu Yuanzhang's 24 sons, usurped the throne in 1402 from a younger and ineffectual nephew, affirming the extremely militant nature of the early Ming state.

Around 1420 C.E., the imperial navy, under Zhu Di's direction, achieved the pinnacle of its growth and development during the midst of the seven star raft expeditions. By that time Ming naval forces, consisting of a total of 38,000 ships, probably outclassed those of any other nation.[25] Included in that number were approximately 2700 coastal patrol ships attached to guard stations or island bases while a main fleet of 400 larger military vessels, along with 400 grain transport freighters, operated out of Nanjing. Two hundred and fifty long-distance ships of immense proportions (known as baochuan, or "treasure ships"), built by the imperial shipyards at Nanjing, carried an average complement of 400-600 men. Three thousand private commercial vessels stood by as auxiliaries, along with a wide selection of smaller craft for use as launches and dispatch vessels.[26] The

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[24]Edward L. Dreyer, "The Poyang Campaign, 1363: Inland Naval Warfare in the Founding of the Ming Dynasty," in Frank A. Kierman, Jr., and John K. Fairbank, eds., *Chinese Ways in Warfare* (Cambridge, 1974), 240. This chapter in the collection is based on part of Dreyer's dissertation, "The Emergence of Chu Yuan-chang: 1360-1365."

[25]Joseph Needham, *Science and Civilization in China*, part 3, vol. 4 (London, 1971), 484.

[26]*Ibid.*

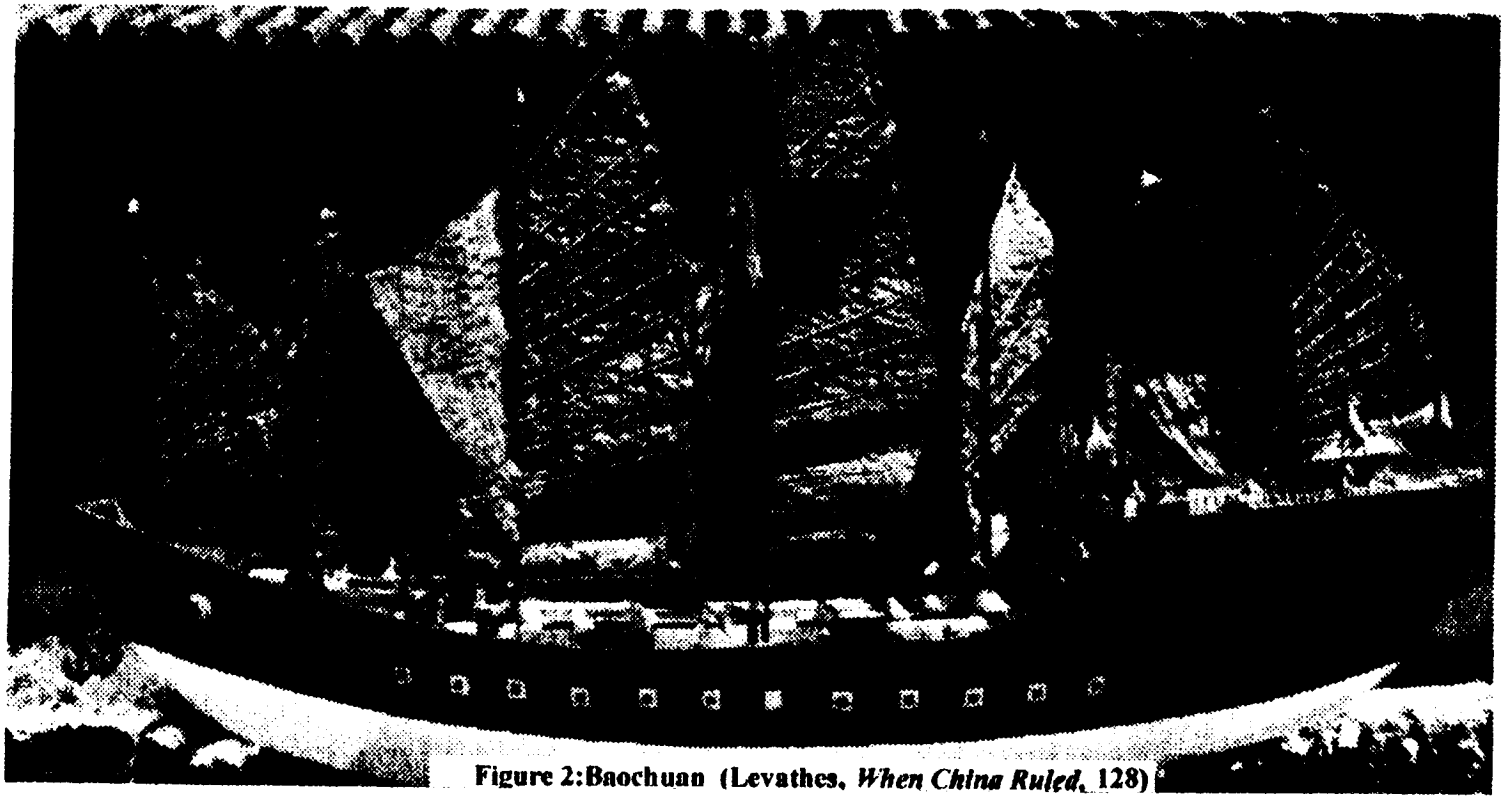

Figure 2:Baochuan (Levathes, *When China Ruled*, 128)

fleets that participated in the star raft missions represented only a portion of the total Ming naval force. The imperial navy, over the course of centuries, had grown from a defensive arm into an instrument of aggression and political domination which operated from the Eastern Sea to the Indian Ocean.[27] This navy ensured peaceful trade conditions throughout Southeast Asia, as well as forcing Japan to accept vassal status for the first time in history.[28]

> As for Our forces, on the sea they are masters of ships and oars; on the land they are skilled at riding and shooting. Nothing is too strong to be broken; no place is too unassailable to be entered. They are not like the forces of the Yuan in the past, which were strong in riding and shooting but weak in seamanship....Should you continue to create disturbances, you will inevitably call forth upon yourself our expeditionary forces. When Our forces come, roaring like thunder and striking like lightning, your country will have no unassailable position to rely upon. You should heighten your walls and deepen your moats and await the arrival of the Celestial soldiers. By that time it will be too late for you to repent...[29]

1. Zheng He's Fleet

The documentary record concerning large-scale naval expeditions and the military control of critical sea routes through Southeast Asia during the period of maritime expansion remains incomplete. Therefore, a combination of primary and secondary sources can offer only a likely estimation of the sizes, numbers, and types of ships, along with their complements. Most sources studied so far involve early Ming expeditions across the Indian Ocean. Although these huge armadas

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[27]Lo Jung-pang, "The Emergence of China," 503. In this interpretation, China possessed the first truly inter-Asian naval squadron.

[28]Hucker, *China to 1850*, 134.

[29]Wang Yi-t'ung, *Official Relations between China and Japan*, 50.

seem quite exceptional when compared to the maritime history of other nations, the little information that does exist indicates other campaigns of similar or even larger size. The Ming voyages, as a culmination of a lengthy naval evolution, are representative of Chinese military control of Southeast Asian trade routes.

From at least as early as the Poyang Lake campaign in 1363, the Chinese navy combined different types of vessels for specific uses within the fleet.[30] The star raft missions, expected to carry out multiple objectives, also sailed with several classes of ships.

Table 4: ship types/size, 1405-1433[31]

type:	length:	beam:	masts:
treasure ships	444'	180'	9
horse ships	370'	150'	8
supply ships	280'	120'	7
troop transports	240'	94'	6
combat ships	180'	68'	5
four-masted ships	146'		
three-masted ships	130'		

[30] *Ibid.*, 223.

[31] Lo Mao-teng, *Hsi-Yang Chi* 1597, as cited in Pao Tsen-peng, *On the Ships of Cheng Ho* (Hong Kong, 1961), 7. Mills repeats these figures almost verbatim. Pao collected the figures on the treasure ships from several sources, such as the *Ming Shi*, *Biography of Cheng Ho*, but especially the *T'ien Kung K'ai Wu*, a technical treatise on aspects of Ming dynasty shipbuilding written by Sung Ying-hsing.

Ships of different types, as in navies everywhere, complemented each other's abilities within the fleet; large vessels were able to handle extended trade, diplomatic, and military functions, smaller combat ships proved faster and quicker to maneuver.[32] 'Small', of course, is a relative concept. As startling as the reported lengths and beams seem to modern readers, the measurements appear over and over again in historical sources. Interpreters of these numbers, however, must recognize that Chinese vessels with traditionally large stern overhangs increased their overall length by as much as thirty percent when compared to European vessels.[33] The 1962 discovery of a rudder at the Nanjing shipyards further substantiates the immense size of the treasure ships, placing the rough estimate of total length between 480 and 536 feet.[34] Waterline length would have been significantly less. Generalized estimates of mass fall in the range of 500 to 1250 tons burthen.[35] The design of Chinese ship gear (no standing rigging) dictated a need for more, shorter, masts for each ship, compared to European ships with taller masts braced with standing rigging.

Information concerning the number of ships involved with each mission proves difficult to decipher. Many authors citing sixty-two treasure ships in the initial star raft mission mistakenly leave out the fleet's support vessels which accompanied the larger treasure ships. Historical records provide examples of some of these auxiliary vessels. "When a large ship makes a voyage, it has a small

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[32]Also note that many of the ports overseas probably had insufficient channel depth for the entrance of the largest Chinese ships, necessitating the use of ships with relatively shallow drafts.

[33]Needham, *Civilization in China*, vol. 4, 481. 'Very large' is probably as exact as any real estimate can be made. Needham uses many of the same primary sources as Pao Tsen-peng for his ship dimensions. The determination of beam measurements has not been adequately examined.

[34]*Ibid.*

[35]*Ibid.*

vessel, with several tens of picked men who know the ways of the sea, and this vessel, called the 'pilot', goes before the larger one...Behind the large vessel two boats are fastened, to be used for the purpose of getting firewood and water and to serve in case of emergency; these are called 'fast horses' or 'boats with feet'."[36] Including these smaller vessels with the combat and storage ships yields much higher numbers.

Table 5: ship numbers and crew complement[37]

trip number:	baochuan:	total fleet:	crew complement
1	62-63	317	27,800
2	unknown	(249 ordered)	unknown
3	48	unknown	27-30,000
4	63	unknown	27,670
5	unknown	unknown	unknown
6	41 built	unknown	unknown
7	unknown	100+	27,411

Following the three initial expeditions which confirmed the security of the distant sea lanes, the high numbers of vessels involved allowed the main fleet to be divided to carry out subsidiary missions throughout the Indian Ocean and Arabian

[36]*Hai Yu*, 1537, as quoted in Groenveldt, *Notes on the Malay Archipelago*, 42n. The quotation continues, describing a shipwreck on the coast of Annam where seventy lives were saved by the use of these emergency boats. These vessels may perhaps be comparable to European pinnaces.

[37]Pao Tsen-peng, *Ships of Cheng Ho*, 20-25. Again, Pao uses several sources here, including the *Ming Shi Biography of the Emperors*, Fei Xin's *Sheng Lan*, and *Court Annals of the Ming*.

Sea.[38] Whether the later expeditions needed to include as many auxiliary and combat ships as the early voyages remains unknown. Exactly how many of these vessels listed as naval participants in these official voyages were semi-private merchant vessels allowed to accompany the fleet is a question that remains unanswered.

Concerning the fleets for which records exist, the average complement totaled over 27,000 men on board over 100 ships. In comparison, Spain's 1588 Armada sailed with approximately 29,435 men on board 130 ships.[39] Vast amounts of supplies, such as grain, rice, water, salt, tea, liquor, oil, candles, and firewood, must have been stowed on board the ships, though exact amounts remain unclear. Some speculation exists concerning a possible connection between the terraced fields found in certain areas of eastern Africa and the fleet's need for tens of thousands of tons of rice while waiting there for the monsoon to change.[40] During these extended voyages of two years or more, trade must have played a more practical role than simple tribute and gift exchanges with China.[41]

The military nature of the star raft missions appears evident from the numbers of mariners who accompanied the voyages although they also served as marines during combat actions. One list included a detailed roster of naval posts.

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[38]Goodrich and Chao, *Dictionary of Ming Biography*, 199. These subsidiary missions were each directed by one of several important senior eunuchs. Wang Qinghuang, most notably, deserves much the same fame as Zheng He.

[39]Colin Martin and Geoffrey Parker, *The Spanish Armada* (New York, 1988), 35. The comparison is only one in passing. No other connection is implied here.

[40]Schwarz, E.H.L., "The Chinese Connections with Africa," *Journal of the Royal Asiatic Society* (1938), as quoted in Teobaldo Filesi, *China and Africa in the Middle Ages* (London, 1972), 16. Filesi, however, feels that Schwarz ventures deep into the realm of pure fantasy regarding these estimates.

[41]For more information on the commercial nature of the expeditions, see Tien Ju-k'ang. "Zheng He's Voyages and the Distribution of Pepper."

Table 6: company description[42]

26,800	mariners
93	commanders
140	ship captains
403	"centurions"
2	senior commanders
868	civil officers
1	military instructor
2	military judges
1	senior secretary, Board of Revue
1	geomancer
180	medical officers and assistants
53	eunuch chamberlains
10	junior eunuchs
7	senior eunuch ambassadors
?	scribes, cooks, navigators, signalers. interpreters, etc.

The marines, for the most part, were pressed into service from naval guard stations close to Liu Jiagang, where the fleet mustered prior to departure.[43] Ming

[42]Snow, *The Star Raft*, 21-22. His use of the term "centurions" may be misleading. Chinese titles lose something in the translation.

[43]Goodrich and Chao, *Dictionary of Ming Biography*, 440. Fei Xin, author of *Hsing Ch'a Sheng-lan* (Captivating Views from a Star-guided Vessel 1436), was probably pressed into naval service from this

armed forces included many banished criminals and/or sons or grandsons working to expunge familial disgrace.[44]

The predominance of eunuchs in administrative positions exemplifies the traditional Chinese trait of civilian control of the military. For many reasons, Zhu Di, the Yongle emperor, needed to reward those eunuchs who had proven so reliable to him. Thus, during his reign, eunuchs for the first time served in command of important military and diplomatic ventures, not only at sea but on land as well.[45] Previously, eunuchs had been attached to expeditions in more circumscribed roles such as interpreters or diplomats. Confucian resistance to granting power to the Chinese eunuchs, who were seen in imperial circles as a dangerous political risk, played a decisive role in ending the star raft missions.

2. Tactics of the Early Ming Navy

At the beginning of its development, the navy functioned in its traditional role as support for siege armies involved in inland conflicts. Warfare strategies at this time were focused on the strength of the walled cities. Ships transported troops to battle sites and sometimes acted as platforms for the siege weapons used against riverine fortresses, an approach favoring large, unwieldy vessels.[46] The emphasis changed with the rise of the Ming imperial navy. As no record of the

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area, traveling on three star raft expeditions, the third, fifth, and seventh, before completing his account of the voyages.

[44]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 32.

[45]David B. Chan, "The Usurpation of the Prince of Yen, 1398-1402," dissertation (Berkeley, 1990), 253. Later, during the interval before the last voyage, Zheng He was awarded the military command of Nanking.

[46]Dreyer, "Inland Naval Warfare," 204.

treasure fleet's naval tactics exists, tactical evolution must be surmised from previous examples. The naval actions during the 1363 Poyang Lake campaign demonstrated several important and uniquely maritime tactical adaptations.

The battle on the inland sea involved three contenders for control of the Yangtze Valley: Zhu Yuanzhang of the emerging Ming state, Zhang Shicheng of the Wu, and Chen Yuliang of the Han. Ming forces fought their campaign on two fronts, both laying siege to Wu's troops downstream while besieged at an upstream fortress by the Han. The mission of Zhu Yuanzhang's fleet consisted of intercepting Han ships which supported the siege and relieving the embattled Ming troops.[47] The Han fleet featured large ships with high shooting platforms. These posed a threat to smaller vessels at close quarters, though they were difficult to maneuver and hampered by their deep draft.[48] Zhu Yuanzhang's Ming fleet contained a mixture of types. Trusted generals commanded the larger vessels. The pirates of Lake Chao, a group which joined the Ming in 1360, led the smaller ships.[49] Again, the ability to recruit endemic maritime talent proved advantageous.

Zhu Yuanzhang's approach to the traditional closed deployment of Han ships illuminates certain important naval adaptations. Dividing his own fleet into eleven squadrons, Zhu issued orders to engage the enemy at long range with firearms, at medium range with crossbows, and at short range by hand-to-hand fighting. In practice, the Ming wisely avoided grappling with the larger Han

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[47] *Ibid.*, 205.

[48] *Ibid.*, 210.

[49] *Ibid.*, 204. Coastal pirates also played a major role in the establishment of China's first grain fleet, and its subsequent protection from Japanese privateers. In fact, "cooperative" pirate forces played significant roles in Yuan and Ming dynasties. Please refer to E.T. Dreyer, *Early Ming China; a Political History 1355-1435* (Stanford, 1982).

ships.[50] Over a period of several days, the faster Ming ships claimed the weather gauge, launched incendiary devices and fire ships downwind into the massed Han formation, and destroyed several hundred enemy ships.[51] The Han, apparently, had no successful response to mobile naval tactics.

The Poyang Lake campaign illustrates several important naval techniques, such as mobility, weather gauge, combined arms fleet, and the refusal to close and board. Most interestingly, the successful Ming forces relied heavily on naval artillery, in part because Zhu Di emphasized the importance of innovative weaponry. In 1407, the Yongle emperor established a fire weapons brigade to provide the appropriate technical training for the relatively new devices.[52] Even so, the cavalry's horses always accompanied naval expeditions, and the marines fought as readily on land as at sea. In contrast to European developments in naval tactics, the Chinese did not place a clear distinction between boarding and long range artillery. Incendiary weapons, which the Chinese had long favored both on land and at sea, filled a tactical gap between close action and long-distance bombardment. Sun Zi's classical work *The Art of War*, written in the fourth-century B.C.E., devoted a whole chapter to the tactical uses of fire weapons.[53]

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[50]*Ibid.*, 222.

[51]*Ibid.*, 210. Dreyer takes many of these descriptions concerning the Poyang Lake campaign from Ming dynastic histories, the *Ming Shi*, vol. 1-8.

[52]*Ming Shi*, chapter 4, as quoted in G. Schlegel, "On the Invention and Use of Firearms and Gunpowder in China, Prior to the Arrival of the Europeans," *T'oung Pao*, 3 (1902), 9.

[53]Sun Zi, *The Art of War* (reprint London, 1963), 141.

3. Fleet Military Objectives -- Southeast Asia

Modern scholars continue to debate the overall purpose behind such large and expensive Chinese missions abroad, but the military intent, whether used in a diplomatic or more active fashion, remained plain: the seas must be kept clear for Chinese trade. The star raft missions, therefore, not only carried arms and soldiers, but possessed a clear understanding of when and where to use them. Zheng He himself, admiral of the treasure fleets, had a tablet erected near Nanjing in 1431, honoring Tian Fei, the spiritual guide of ocean voyagers.[54]

> On arriving in the outlying countries, those among the barbarian kings who were obstructing the transforming influence and were disrespectful were captured alive, and brigands who gave themselves over to violence and plunder were exterminated. Consequently, the sea route was purified and tranquilized and the natives, owing to this, were enabled to quietly pursue their avocations. All this is due to the aid of the goddess.[55]

The superior attitude held by the Chinese toward those deemed barbarians aside, pacification of important sea trade routes obviously played a major role in the voyages. Except for a few instances, the Chinese navy accomplished its task with only a passive display of strength, exacting at least nominal allegiance from all quarters. Seven major expeditions made contact with over thirty foreign

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[54]For more information on the cult of Tian Fei (also known as Tian Hou or Ma-Tsu) see James L. Watson, "Standardizing the Gods: the Promotion of T'ien Hou ("Empress of Heaven") Along the South China Coast, 960-1960," D. Johnson et al. (eds), *Popular Culture in Late Imperial China* (Los Angeles, 1985); also Chen Ying-chieh, "She Calms the Waves and Cures the Sick," *Free China Review*, vol.22 no.6(1972), 19-22.

[55]J.J.L. Duyvendak, "The True Dates of the Chinese Maritime Expeditions," 345. An interesting official line for Zheng He, considering the fact that he was a Muslim (though many eunuchs were Buddhists). Religious tolerance was a distinct advantage that Chinese diplomatic missions achieved. Some stone inscriptions left by the fleets simultaneously recorded events for three different cultures, Hindu, Buddhist, and Islamic.

nations from Southeast Asia, the eastern Indian Ocean, and the African coast. Yet, it may have been too much to expect that a force manned and armed as sufficiently as the imperial expeditions could have operated peacefully the entire time. Zheng He, either under instructions from the emperor or reacting independently to local conditions, relied on armed aggression at least three separate times (the first, third, and fourth voyages) in order to fulfill his mission. These incidents suggest that the emperor did, indeed, intend to back up his claim to universal control of trade by force. Two of these three incidents took place in Southeast Asia.

The first voyage, 1405-1407, sailed south out of the China Sea late in the year, stopping at points in Champa, Java, and Sumatra before proceeding through the Malaccan Straits and across the Bay of Bengal to its main objective, Calicut, on the west coast of India.[56] Touching briefly at Ceylon, the fleet sailed towards home with the southwestern monsoon, stopping at Palembang on the Sumatran coast. The Kingdom of Palembang had been conquered by Java which, afterwards, could not consolidate its claims, the area falling into disarray.[57] Communities of independent overseas Chinese exerted their own authority, some of them preying on the rich seaborne traffic through the narrow straits. The unsafe sea lane violated the military and economic aims of the Chinese imperial navy.

The unstable situation provided Zheng He's troops with their first military accomplishment. Chen Cui, the renegade chieftain of Palembang, had originally escaped to Sumatra from the region near Guangzhou. While he never failed to send China the tribute traditionally demanded from countries in Southeast Asia, he

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[56]*Ibid.*, 358. The *Wu Pei Chi* also records specific lists of destinations and copies of the charts and sailing instructions for the fleet.

[57]Groenveldt, *Notes on the Malay Archipelago*, 71.

also led a fleet of pirates operating in the Malaccan strait.[58] Feigning obedience to Zheng He's authority, Chen plotted against the imperial forces, planning a surprise attack on their camp. Zheng He learned of this from another Guangzhou local, Shi Jinqing (who, thus, earned the title 'Pacificator of Palembang'). The Admiral defeated Chen Cui, killing over 5000 of his followers and burning or capturing seventeen ships.[59] Chen, captured alive, was returned to China and executed. The imperial navy seemed to have little difficulty securing the strategically important Strait of Malacca for safe travel.

The fourth voyage, 1413-1415, differed from previous trips by continuing all the way across the Indian Ocean, through the Maldive Islands, to the Arabian peninsula and the Gulf of Oman. A branch expedition, under the direction of another eunuch commander, sailed to Bengal.[60] Before the main fleet reached the Andaman Sea, though, a stop in northwestern Sumatra led to another conflict. Sekandar, nephew to a murdered king, had assembled several thousand men around his fortification in the mountains, from which he attacked the Sumatran forces.[61] Angered by the distribution of gifts and imperial favors to an illegitimate throne, he led his forces against the Chinese. Zheng He, operating under imperial instructions, defeated Sekandar's forces, then pursued and captured him, along with his wife and child, in Lambri.[62] Sekandar was subsequently returned to China and executed in 1415. The phrase 'captured alive' begins to appear as something at

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[58]Needham, *Civilization in China*, part 3, vol. 4, 515.

[59]*Ibid.* Proscribed by the previous emperor, Chen was, technically, a fugitive. His subsequent arrest and extradition back to China gives us an example, therefore, of the long arm of the imperial law.

[60]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 13.

[61]Groenveldt, *Notes on the Malay Archipelago*, 86.

[62]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 13.

which the Chinese particularly excelled. The lack of regard for the process of legitimate royal succession does not appear striking, given the fact that the Yongle emperor himself had only a tenuous claim of birthright to China's throne. This relatively simple demonstration by armed forces affirming the viability of the status quo in Sumatra does, however, help to interpret the intent of the Ming dynasty and the military use of its fleets. Maintenance of the status quo without regard to true birthright, especially in an important trade artery as the Strait of Malacca, again demonstrates the importance of free sea lanes to fifteenth-century China.

4. Malacca

Compared to Chinese economic and political relations with the other countries of Southeast Asia, Malacca appears to be an exceptional case. Although recorded as having sent and received many important diplomatic tribute missions, this minor state had been dominated by Siam until 1409 C.E., when Zheng He officially brought it under Chinese aegis.[63] Surprisingly, Malacca had few natural resources except tin, which served as the local currency.[64] Only after the founding prince, a noble from Palembang (Sumatra), received the protection of the Chinese against the Kingdom of Siam did Malacca develop into an important international entrepot. The new kingdom applied for full protection from the emperor, who responded by sending a personal inscription and ordering the kingdom's western

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[63]*Ibid.*, 108.

[64]Guy, *Oriental Trade Ceramics*, 32.

mountain included on the list of Chinese sacred sites.[65] This was chiefly due to its strategic position on the Straits of Malacca, and its new function as repair station and "cantonment" for the Ming armadas, then sailing past on the western sea route.[66] The Chinese creation of Malaccan power served as an effective way to dominate the strategic straits.

> Whenever the treasure-ships of the Central Country [China] arrived there, they at once erected a line of stockading, like a city-wall, and set up towers for the watch-drums at the four gates; at night they had patrols of police carrying bells; inside, again, they erected a second stockade, like a small city-wall, [within which] they constructed warehouses and granaries; [and] all the money and provisions were stored in them. The ships which had gone to various countries returned to this place and assembled; they marshalled the foreign goods and loaded them in the ships; [then] waited till the south wind was perfectly favorable. In the middle decade of the fifth moon they put to sea and returned home.[67]

Arab, Chinese, and Southeast Asian sailors all fully realized the convenience of secure overseas ports for the storage of goods and the repair of ships. From a geographical perspective, Zheng He's port in the Malaccan kingdom, as other harbors in the straits area, lies at the convergence zone between two large spheres of maritime activity. Monsoon winds which brought Arab ships east across the Indian Ocean differed in both season and direction from the winds which brought the Chinese ships south to the trading ports in Southeast Asia.

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[65]These were acts previously only granted countries geographically much closer to China, namely Korea, Annam (North Vietnam), and Champa (central Vietnam). See Wang Gungwu, *Community and Nation*, 49.

[66]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 114. The importance of tin from Malacca may be underestimated. As stated elsewhere, Chinese documentation of imported base metals is incomplete.

[67]*Ibid.*

Ports at the western edge of this region served as staging areas for vessels expecting to either reverse direction for home or continue on longer voyages.[68]

Concerning Ma Huan's description of Malacca, scholars remain divided on whether the fleets truly erected the cantonment on every visit, or only on the fourth (or seventh) missions.[69] Due to the relative lack of natural resources, it appears that Malacca's status was based more on strategic rather than economic position. It was at Malacca that the westbound armada divided into separate fleets, each intended for different locations, such as the Bay of Bengal or the Arabian Sea.[70]

D. Naval Weaponry, Song to Early Ming Period

Chinese naval history not only emphasizes the Celestial Kingdom's ability to control crucial sea lanes, but also offers exact descriptions of artifact types associated with military expeditions. Cannon, shot, and other bulky weaponry often offer nautical archaeologists the best, if not the only, clues concerning historic wreck sites.

During the early fifteenth-century, both in China and Europe, traditional siege weapons were beginning to share operations with more modern devices, especially cannon. This transition, however, did not take place abruptly. For a long period, weapons such as crossbows, incendiary arrows, fire tubes and trebuchets (catapults) with exploding payloads continued to rule the field.

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[68]A better study on monsoonal trade patterns in the Indian Ocean, along with maps, occurs in K.N. Chaudhuri, *Trade and Civilization in the Indian Ocean* (Cambridge, 1985).

[69]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 113n. Paul Pelliot felt these activities took place on the seventh, and Wheatley the fourth expeditions, respectively.

[70]*Ibid.*

Traditional Chinese arms included a variety of these weapons, as cast cannon were in a relatively early stage of development. Direct references to the exact armament of the early Ming fleets unfortunately prove quite rare. One, a later (1576) military treatise states that each Ming combat vessel, as of 1393, was required to carry four guns with bore "the size of rice bowls," twenty guns of smaller character, ten bombs, twenty rockets, and a thousand rounds of shot.[71]

What types of guns, bombs, and rockets did the Ming commanders have from which to chose? Equipment intended for land use and hand-to-hand combat (land mines, cavalry accouterments, broadswords, etc.) will not be included in this study. Rather than a complete list of Chinese bombs, rockets, flame-throwers, and guns, only examples of the more important types of weapons will be depicted.

Crossbows, invented in China sometime near the fourth century, were issued as standard weapons to naval fighting vessels from the Song dynasty onwards. Repeating crossbows, complete with replaceable magazines of a dozen bolts, also date from the Song. Experimental reenactments using replicated weapons suggest that well-trained crossbowmen, forming loading, advancing, and firing ranks, could discharge hundreds of arrows in a matter of seconds.[72] Chinese marines preferred to use these handheld, flat-trajectory weapons (effective range about 80 yards) from the fighting tops, firing down onto enemy vessels for greater accuracy.[73] Much larger composite artillery crossbows were mounted on heavy frames and operated by a mechanical crank. These had an extreme range of 1160

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[71]Schlegel, "Use of Firearms..." 9.

[72]Temple, *The Genius of China*, 223. The reenactment tests give the results as 100 crossbowmen firing 2000 bolts in fifteen seconds, an alarming rate. No further details were given.

[73]*Ibid.*

yards, though whether they were capable of being used on board a ship remains to be discovered.[74]

By 1405, simple incendiary arrows, composed of fast burning Chinese mugwort, rosin, and oil, had been supplemented by gunpowder arrows. A five-ounce charge of saltpeter, sulfur, charcoal, arsenic, and camphor, wrapped in cloth or paper, bound to the shaft near the head, and ignited by a fuse, provided the explosive.[75] References to charges include a wide variety of explosive, incendiary, and poisonous mixtures.

Fire tubes, or fire spears, also had a long history of use before Ming times. Tightly packed compositions of saltpeter, sulfur, charcoal, and cinnabar (sometimes refined as mercury to produce especially debilitating burns) were attached to spears, pikes, and staffs.[76] Ignition gave a three to five minute jet of fire, somewhat like a Roman candle, of limited range, yet useful for setting rigging and sails ablaze in close quarters. An Italian manual on pyrotechnics, written in 1540, noted that "above all, they [fire tubes] are good in naval battles."[77]

The evolution of fire tubes, from wooden to metal barrel, the spear point disappearing and the staff eventually becoming a handle, provides a glimpse of the development of a proto-gun or hand cannon. The addition of a mixture of projectiles, ceramic, stone, and metal, turned the fire tube into a type of projectile and flame scattering weapon known as an eruptor. These could spew fire, poison,

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[74]Temple, *Genius of China*, 222. Needham's work is the basis for most of these descriptions in Temple's book.

[75]Mao Yuan-I, *Wu Pei Chi*, 1621, as quoted in Tenny L. Davis and J. R. Ware, "Early Chinese Military Pirotechnics," *Journal of Chemical Education*, 24 (1974), 523.

[76]Davis and Ware, "Military Pirotechnics," 525.

[77]Vannoccio Biringuccio, *Pirotechnia* (Venice, 1540; reprint New York, 1942), 246.

and assorted shrapnel simultaneously.[78] Fire tubes used in this manner may have been included in the 'twenty guns of smaller character' category. A military treatise of 1412 describes such a 'coviative' weapon (the charge mixed with the projectiles), known as the 'poison-fog magic-smoke eruptor,' perhaps a large mounted fire tube. In fact, hand-held fire tubes were still in use during the mid twentieth-century, protecting local junk traffic from modern pirates in the South China Seas.[79]

The trebuchet or catapult, the medieval siege weapon par excellence, also operated on board naval vessels. Admiral Huang Faqiu first placed catapults onto barges in 573 C.E.[80] By the eighth-century, placing trebuchets on naval combat vessels' upper decks had become an accepted practice.[81] The machines played a major role in the two attempted invasions of Japan during the Yuan dynasty. European depictions of naval trebuchets exist from 1449 and show them throwing incendiary materials.[82] Unlike western trebuchets which relied on sinew and spring, however, Chinese devices operated by sling and swape. Teams of pullers manned lines attached to the arm itself, providing the motion to the projectile wrapped in the sling at the other end. Trebuchets had an effective range of 85 yards.[83] Though the Mongols introduced a larger counterweighted weapon of

[78]Temple, *Genius of China*, 243. Needham coined the term 'coviative', describing the lack of any separation of powder charge, harmful chemicals, and shrapnel.

[79]Robert Cardwell, "Pirate Fighters of the South China Sea," *National Geographic*, ser. 6, 89 (1946), 787. Nineteenth-century cannon, with grape-shot loads consisting of anything from rusty nails to broken dishes, also lined the decks of old junks. Often more modern automatic weapons were stored below.

[80]Joseph Needham, "China's Trebuchets, Manned and Counterweighted," *Humana Civilitas* (Cambridge. 1976), 108.

[81]*Ibid.*, 117.

[82]*Ibid.*, 125n. Needham refers to *De Machinis* by Jacopo Mariano Taccola, circa 1449.

[83]*Ibid.*, 113.

Figure 3: Naval Trebuchet (Needham, "China's Trebuchets..." 138.)

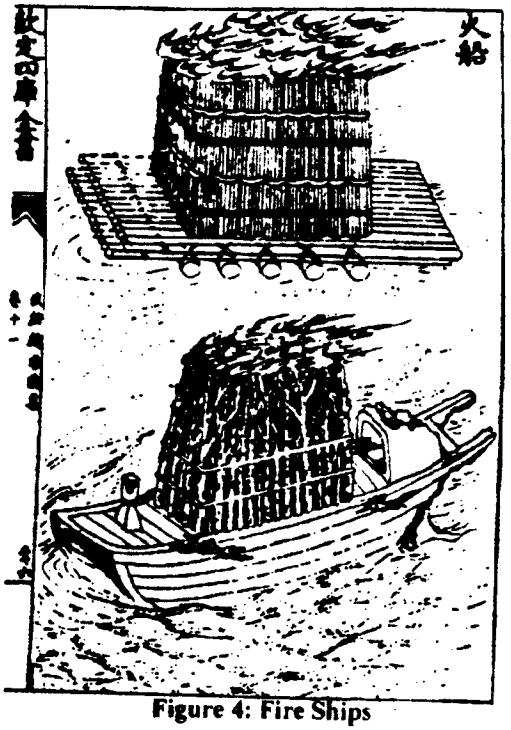

Figure 4: Fire Ships

(Needham, *Civilization in China*, 71.)

distinctly western design, Zhu Yuanzhang, founder of the Ming dynasty, returned to the manned Chinese versions. He much preferred mobility to size.[84]

During the fourteenth-century, as gunpowder artillery became more effective, cannon and trebuchets operated side by side. Chinese technicians (as did their western counterparts), much to the dismay of modern researchers, habitually referred to the trebuchet by the type of projectile it cast. Thus, devices which threw or otherwise employed explosive powder (both cannon and catapult) had the same name, 'huo pao'. This situation becomes very complicated in the latter half of the fourteenth-century as the Chinese military used a wide variety of incendiary, explosive, and poisonous bombs.

The Ming imperial navy had a vast array of fireballs, bombs, and grenades from which to select. By 1350 fragmentation bombs and cast iron bombshells, filled with brisant, a high-nitrate explosive, existed in many shapes and sizes.[85] The 'pi lipao' bomb, a particular favorite in naval warfare from the Song dynasty onwards, consisted of a thick paper shell filled with lime and sulfur. Ming fleets almost certainly carried this bomb on board. Song general Yu Yunwen described the effects of the weapon in 1161.

> Then all of a sudden a thunderclap bomb was let off. It was made of paper and filled with lime and sulfur. [Launched from trebuchets] these thunderclap bombs came dropping down from the air, and upon meeting the water exploded with a noise like thunder, the sulfur bursting into flames. The carton case scattered and broke, scattering the lime to form a smoky fog which blinded the eyes of men

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[84]Needham, "China's Trebuchets," 118.

[85]Needham, *Civilization in China*, part 7, vol. 5, 180. It was during the Song dynasty that the percentage of nitrate in the powders in general use increased to seventy-five percent, making the leap between the 'erupting' powder to the truly explosive gunpowder.

> and horses so that they could see nothing. Our ships then went forward to attack theirs, and their men and horses were all drown[ed], so that they were utterly defeated.[86]

The thunderclap bombs, a type of chemical weapon not unlike tear gas, exploded as the sulfur came in contact with the water.

Other poisonous chemical agents were added to many types of explosive powder charges and even fragmentation bombs. The 'bone-burning and bruising fire-oil magic bomb' of the early Ming dynasty combined tung oil, urine, sal ammoniac, feces, scallion juice, and shrapnel of iron pellets and broken porcelain around a solid gunpowder core.[87] Other inflammatory mixtures, including naphtha, were used in conjunction with explosives in casings surrounded by hooked iron caltrops, designed to attach the bomb to wood or catch sails and rigging. Hand-held grenades, smaller versions of the trebuchet-launched bombs, had a much shorter range. These may have been issued to shore parties or marines aloft and not included on the ship's requisite list of ten bombs.

A sea mine, called the 'submarine dragon-king', dates from the beginning of the Ming dynasty. A waterproof wrought iron chest covered with ox bladder, submerged on a wooden board and weighted with stones, contained the charge. The fuse, wrapped in goat intestine, led to a small float on the surface. Lighting a joss stick allowed the mine enough time to drift down river into enemy ships, or be attached to the anchor cables.[88] Whether naval regulations included this type of device as mandatory or not, its maritime nature remains noteworthy. Riverine

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[86]*Ibid.*, 166. Yang Wan-Li, *Hai Ch'iu Fu.*

[87]*Ibid.*, 180.

[88]*Ibid.*, 205.

warfare developed naturally in a country so involved with inland waterways such as the Yangtze delta.

Ming regulations make no mention of naphtha flame-throwers, though they existed from as early as the Song dynasty onwards.[89] Refined petroleum, ejected from a brass tank through a double-acting piston pump, had the added advantage of floating on water. The army had such devices by 1040. Certain 'barbarians' in shallow-draft vessels used naphtha weapons against the imperial navy in 1298.[90] Again, inclusion of this type of flame-thrower on the combat vessels under Zheng He's command remains in the realm of speculation.

Fire ships, known from the second century, proved quite effective when drifting into enemy formations. Zhu Yuanzhang, during the Poyang lake campaign, gathered fishing boats and loaded them with bundles of straw filled with gunpowder and dummies shaped like men (complete with sets of armor and helmets). He sent them downwind against the tightly packed enemy formation, burning hundreds of ships in this manner.[91] The few men who worked the boats among the enemy ships and 'dared to die' had little chance of escape. Rather than being recognized as a regular device carried on board, this weapon was most likely improvised (as Zhu Yuanzhang did) on the spot.

The Ming fleets definitely maintained true cannon with specified and constant bore diameter on board naval combat vessels. By the time of the treasure fleets, cast cannon had been produced in China for at least 100 years. Most early

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[89]Needham, *Civilization in China*, part 3, vol. 4, 82.

[90]*Ibid.*, 87.

[91]Dreyer, "Inland Naval Warfare," 226. Chinese fire ships also played a role during the Opium Wars between China and England during the nineteenth century. For more information refer to Jack Beeching, *The Chinese Opium Wars* (New York, 1975).

Ming examples extant today are cast bronze, though several are of cast iron. Many have trunnions, reinforcing rings, expanded or thickened breeches, and touch-holes with movable covers.[92] By 1380, the military weapons and cavalry equipment bureau (note the continued support of land warfare) produced 3,000 bronze cannon with bores the size of rice bowls and 3,000 smaller cannon along with 90,000 'bullets' every three years.[93] By 1403, during Zhu Di's reign, imperial foundries were ordered to produce cannon using only refined 'copper' (bronze) or a mixture of refined and unrefined copper.[94] The military treatise of 1412 describes a cannon of seventy-two kilograms, two feet eight inches long, and with a bore diameter of more than 2.2 inches. The lead shot weighed 1.2 kilograms.[95] One specific example of the size specifically mentioned in the 1393 naval regulations contains the inscription:

> Left Naval Station Chin Series no. 42
> Large Bowl Muzzle Tube
> Cast on an auspicious day in the twelfth month
> of the fifth year of the Hongwu reign-period [1372]
> by the Pao Yuanzhu [bureau].[96]

The naval station mentioned in the inscription was near Nanjing during the star raft missions. It provided many of the escort warships and marines for the

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[92]Needham, *Civilization in China,* part 3, vol. 4, 516.

[93]L. Carrington Goodrich and Feng Chia-Sheng, "The Early Development of Firearms in China," *Isis,* 35 (1944), 122. Their information comes from Wang Chi's *Wen Hsien T'ung K'ao,* circa 1586.

[94]*Ibid.*

[95]Temple. *Genius of China,* 246.

[96]Needham, *Civilization in China,* part 3, vol. 4, 516.

voyages.[97] Rounded stone and carefully cast bronze or iron cannon balls exist today as examples of medieval Chinese solid shot.[98]

Drawings from the 1412 military treatise illustrate a type of naval gun carriage capable of swiveling to aim the cannon. Two cannon mounted on opposing ends of a bench-like carriage, known as a 'Mr. Facing Two-ways' weapon, effectively doubled the rate of fire. "Immediately after firing the first gun the second is rotated into position and fired, each one being muzzle-loaded with a large stone projectile. If the gun is aimed at the hull of an enemy ship below the water-line, the cannon balls shoot along the surface and smash its side into splinters. It is a very handy weapon."[99] British gunners, hundreds of years later, also appreciated the effectiveness of skipping shot along the surface of the water, concentrating their fire at the hull rather than the rigging of enemy ships.[100] Interestingly, a European equivalent of the double-ended swivel carriage appears contemporary with the Chinese example.[101] Certainly, though, more dissimilarities appear evident between naval weaponry of the East and West than positive comparisons.

Finally, rockets of different types make up the last category of early Ming naval weapons. Many Chinese rockets took a form similar to arrows with propellant driver tubes located near the head and iron counterweights attached to the tails. From the Song dynasty onwards, the Chinese found them most effective

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[97] *Ibid.*

[98] Temple, *Genius of China*, 246.

[99] *Ibid.*, 248.

[100] Martin and Parker, *Spanish Armada*, 165.

[101] R. Coltman Clephan, "The Ordnance of the Fourteenth and Fifteenth Centuries," *Archeaological Journal*, ser. 18, vol.68 (1911), 81.

when fired in massed volleys.[102] Styles and sizes of launching arrays varied from hand-held models holding ten rocket arrows to larger, mounted structures firing 100 or more missiles at a time. Rocket weapons also included rounded projectiles complete with propellant tubes and wings. One, the 'magic-fire flying-crow', found use by Ming naval forces:

> The body of the bird is made of fine bamboo lathes or reeds, forming an elongated basket work, in size and shape like a chicken, weighing over 0.6 kilos. It has paper glued over to strengthen it, and it is filled with explosive gunpowder. All is sealed up using more paper, with head and tail fixed before and behind, and the two wings nailed firmly on both sides, so that it looks just like flying crow.
>
> Under each wing there are two slanting rockets. The four-fold branching fuse, connecting with the rockets and about a foot long, is put through a hole drilled through the back of the bird. When in use, this main fuse is lit first.
>
> The bird flies away more than 1000 feet, and when it finally falls to the ground, the explosive gunpowder in the cavity of the bird is automatically lit, and the flash can be seen miles away. This weapon is used against enemy encampments to burn them, but also at sea to set ships on fire. It should never fail to bring victory.[103]

Unfortunately the description does not include any indication of how accurate rockets of this type proved to be in naval situations; ships at sea present much smaller targets than troop formations massed on land.

Another type of early Ming dynasty rocket, perhaps a very distant ancestor of the modern Exocet missile, featured the first use of a multi-stage propulsion system.[104] Four rocket devices, waterproofed and fastened to the outside of a five-

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[102]Xu Huilin, "Gunpowder and Ancient Rockets," *China Reconstructs*, no. 10, vol.29 (1980), 58. Japanese descriptions of rocket fire from invading Mongol fleets includes missiles which "fell like rain" on their ships.

[103]The *Fire-Drake Artillery Manual*, 1412, as quoted in Temple, *Genius of China*, 240.

[104]Needham, *Civilization in China*, part 7, vol. 5, 508.

foot length of bamboo tube, propelled the weapon towards the enemy vessels. Within the tube were placed the second-stage rocket arrows, which ignited and issued from the mouth of the tube when the initial stage had been almost exhausted. A carved dragon's head and tail completed the device.

> ...in the belly of the dragon there are several 'mysterious mechanism rocket arrows'. At the dragon head there is an opening through which go all the fuses for the rockets inside....The fuses of the four rockets are twisted into a single one. In a naval battle the apparatus can fly 3 or 4 feet above the water.
>
> Upon lighting it will fly over the water as far as 2 or 3 li [1816 yards maximum]. At a distance it really looks like a flying dragon coming out of the water. When the gunpowder in the rocket-tubes is nearly all finished, (that in the rocket arrows within the belly is ignited, so that) they fly forth, destroying the enemy and his ships.[105]

The fish tail, just skimming the surface of the water, probably controlled the height of the missile, similar to a flying fish stabilizing itself during its flight. The 'fire-dragon issuing from the water' truly exemplifies the advancement of naval weapons technology in the early fifteenth-century. Whether or not expeditions carried these multi-stage rockets across the Indian Ocean remains unanswered, but these and the other weapons listed above were contemporary with the star raft missions and available to the commanders and/or administrators responsible for fitting out the combat vessels. Furthermore, several engagements successfully conducted by the Chinese navy testify that the armed might of the ships and marines extended beyond a purely diplomatic display.

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[105]*Ibid.* Again, from the *Fire-Drake Artillery Manual*, 1412.

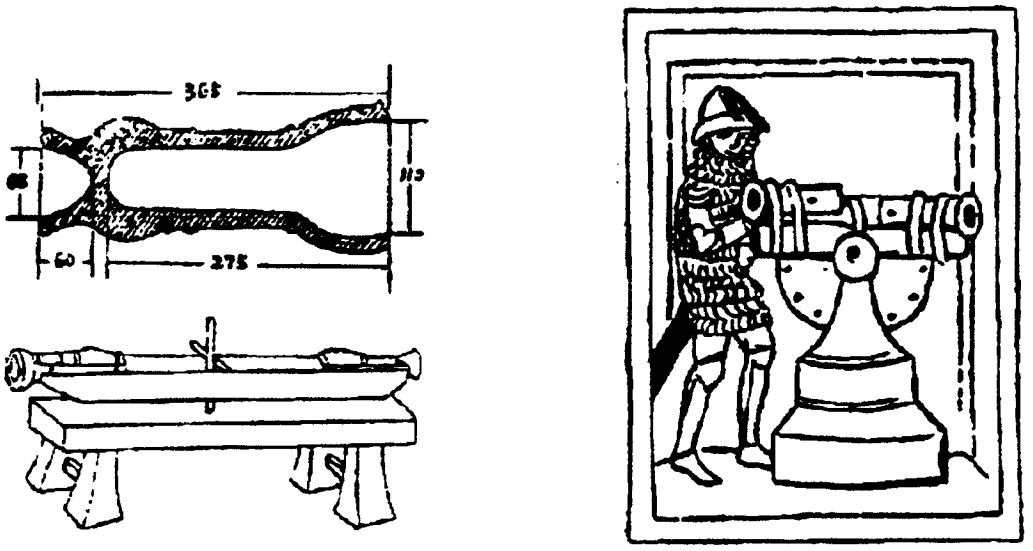

Figure 5: Mr. Facing Two Ways (Chinese and European)
(Needham, *Civilization in China*, 302; Clephan, "Ordnance..." 81.)

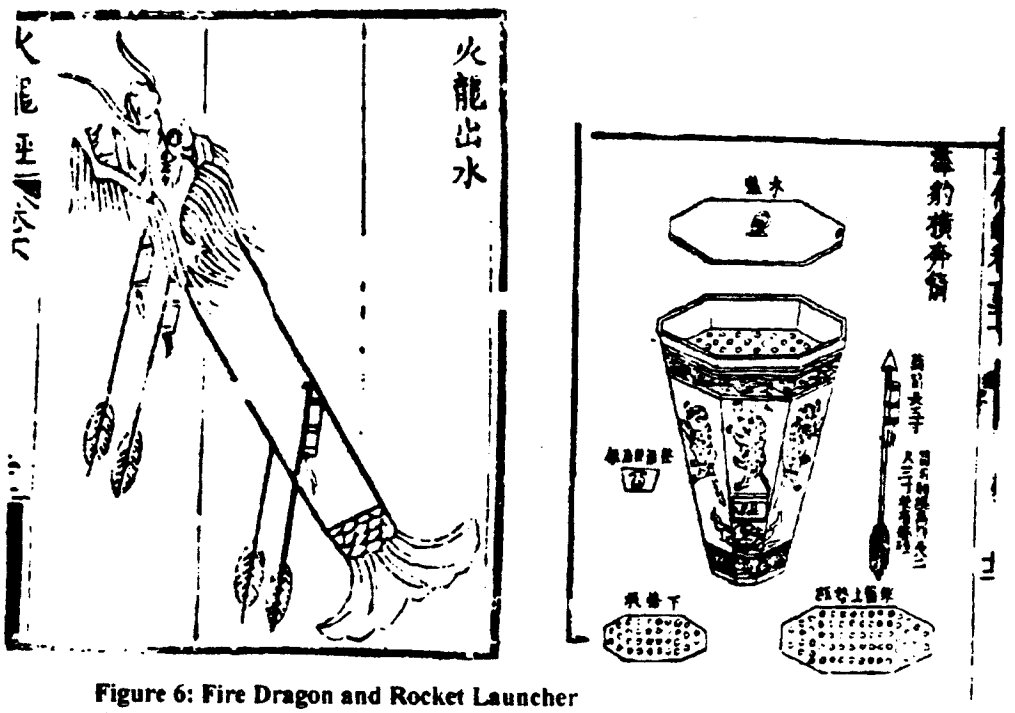

Figure 6: Fire Dragon and Rocket Launcher
(Needham, *Civilization in China*, 510, 493.)

Conclusions

Interesting contradictions present themselves in the interpretation of the potential use versus the actual use of power by the Ming treasure fleet in the early fifteenth-century. By 1405 the fleets China sent to the West comprised only part of their naval forces. Technological advancements and the ability to organize resources and manpower assured the Ming dynasty of virtual superiority over every other contemporary Asian nation. Yet, during the height of maritime expansion, the same domestic smuggling problems long associated with the lack of control of the maritime provinces continued to plague the Ming dynasty. Piracy could be controlled, but not eliminated.[106] Actions suppressing piracy and ending local power disputes, where effective, emphasized the Chinese imperial government's desire for uninterrupted peaceful commerce.

Elsewhere in China, the naval situation presented a much more difficult challenge. In 1420 the imperial fleets suffered their first major defeat in the Red River delta, soon followed by an evacuation of Tonkin in 1428.[107] Campaigns against the Mongols north of the Great Wall seemed to meet with as little success as they had traditionally. The early leaders had appreciated a strong navy, but subsequent emperors reasserted China's traditional priorities of protection against invasion from the north and west. By 1433, however, Zhu Zhanji (China's fifth Ming emperor), swayed by Confucian resentment of eunuch power and extravagance, as well as upholding the conservative doctrine of the immorality of any contact with 'barbarians', doomed the far-flung maritime expeditions. Though

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[106]Even after the Ming Ban, officials on China's long coast were ever vigilant against Japanese pirates. See J. Meskill (trans. and ed.), *Phyohae-Rok (Chhoe Pu's diary: a record of drifting across the sea 1488)* (Arizona, 1965).

[107]Lo Jung-pang, "The Decline of the Early Ming Navy," *Oriens Extremis*, 5 (1958), 151.

eminently capable, the imperial treasure fleet faced a greater complex of cultural obstacles, rather than a clearly defined military threat. The Ming navy had no weapon to deal with that type of problem. The completion of the Grand Canal, eliminating the need for a strong navy along China's coast, combined with the death of Zheng He in 1434, led to the cancellation of the star raft expeditions. "Warships, no longer sent out to sea on patrols, were anchored in ports where they rotted from neglect."[108] Traditional pacifist forces won out in the end.

> Arms are the instruments of evil which the sage does not use unless he must. The noble rulers and wise ministers of old did not dissipate the strength of the people by deeds of arm. This was a farsighted policy...Your minister hopes that your majesty...would not indulge in military pursuits nor glorify the sending of expeditions to distant countries. Abandon the barren lands abroad and give the people of China a respite so that they could devote themselves to husbandry and to the schools. Thus, there would be no wars and suffering on the frontier and no murmuring in the villages, the commanders would not seek fame and the soldiers would not sacrifice their lives abroad, the people from afar would voluntarily submit and distant lands would come into our fold, and our dynasty would last for ten thousand generations.[109]

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[108] *Ibid.*, 158.

[109] *Ibid.*, 167. Memorial showing influence of Lao-tzu, written by the minister Fan Chi, 1426, recorded as *Ming ch'en tsou-i*.

Chapter Five
Maritime Geography of Southeast Asia: Song to Early Ming

Introduction

Almost all presentations of Chinese overseas maritime history have one theme in common: the importance of the crucial sea routes leading into and through Southeast Asia. The historical examination of both commercial and military activities reveals certain areas in Southeast Asia as more important to maritime activity than others. Locations familiar to Chinese sailors included important anchorages, major trading areas, ship repair and supply facilities, and other sites similar to those known to mariners the world over. Knowledge of these locations and their significance is an important part of the story of Chinese maritime expansion. It is also important to the creation and interpretations of an archaeological research plan.

A. Criteria: Selection of Maritime Sites

The selection of significant places is not meant as a proposed survey plan. Selection naturally involves subjective decisions, historical bias, and an unscientific exclusion of control areas, among other problems. The geographical picture of significant maritime sites does, however, have much to contribute to archaeological investigations. By creating a map of maritime locations during the period of extensive Chinese activity, those sites related to Chinese maritime operations can be identified and a better understanding of the workings of trade and control of Southeast Asia can be reached. Furthermore, this information can

This must not be confused with a survey list, however. The proposed map may be much more useful to the later post-survey phases of archaeological interpretation, rather than an initial proposal. Shipwrecks seldom happen in planned locations, but can only be inferred to have some loose relationship with areas of intensive maritime activity. Physical remains from events other than shipwrecks, such as long-term habitation and trading activity, may be safely assumed to be associated with these selected locations. In several instances, modern archaeological investigations confirm, and add, to the list of historically documented sites.

The two previous chapters on trade and military control provide the background information for the determination of significant maritime locations in Southeast Asia. Important trade ports in areas now known as Vietnam, Philippines, Borneo, Thailand, Sumatra, Malaysia, Java, and Burma were quite familiar to the nautical Chinese. The total amount of economic contact and goods traded at ports in Southeast Asian entrepots, and the political and military control of the region which developed toward the latter part of the period affirm the intensity of maritime expansion. The historic background serves to place the significance of these critical maritime locations in perspective. Portraying this data in an organized fashion calls for the first stages of a synthesis of the previous historical information. An indexed map best portrays this type of summary. Site designations by country are followed by the name/location table, which includes a brief version of maritime significance and references.

This map is not, however, an extensive list of Chinese geographical knowledge. The Chinese were long familiar with the seas and islands of Southeast Asia, and in many cases had several names for most of the geographical features. Only sites directly related in some way with maritime traffic or large scale historic nautical events have been selected for inclusion. To construct a map of all known

places would merely confuse matters further, adding little to the continuation of nautical research. Only those places specifically mentioned as major trade areas, sites of naval engagements, and those specifically noted as major anchorages, along with modern locations of related archaeological finds have been included. Known landmarks important to navigation, but not otherwise designated as serving further maritime functions, have been excluded.

Unlike the majority of Chinese maritime history, discussion of overseas ports benefits from an excellent primary source, the Mao Kun map.[1] The name refers to an historic figure Mao Kun, an early sixteenth century naval staff officer who devoted his life to seaboard strategy and the defense of the Chinese coast. Most scholars agree his information refers directly to data contemporary with 1430 C.E. or slightly earlier.[2] These maps were given, along with a manual of compass bearings, to the commanders of the early Ming expeditions.[3] The Mao Kun map provides information on over 500 locations throughout the known Chinese maritime world, necessitating some sort of method for discrimination. The documents contain information on many other sites not directly related to maritime traffic, as well as information on foreign trade, communities, and mythical beliefs. Map references to the Mao Kun document originate with the translations of J.V.G. Mills, while citations of Mills *et al* represent Mao Kun data through the accumulated translation and work of many prominent scholars.[4]

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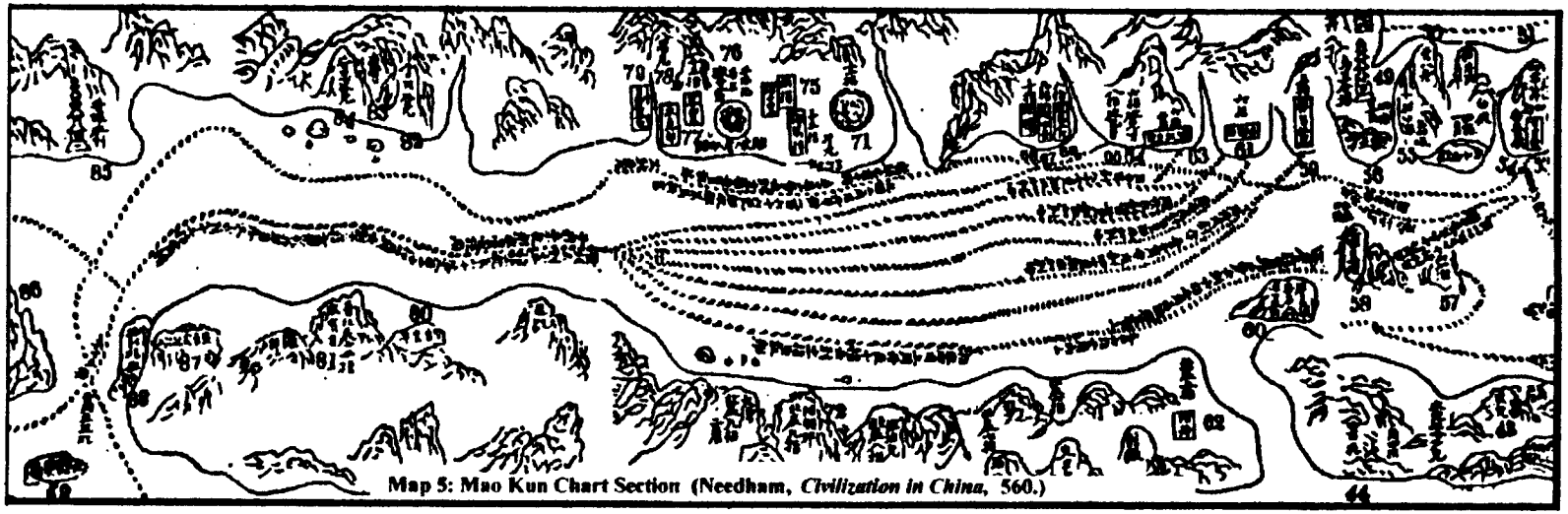
[1]Ma Huan, *Triumphant Tour of the Ocean's Shores,* 236. Mills' extensive additional notes and information on geographical locations (within this same text) will be cited in this chapter as 'Mills, *Triumphant Tour*, in order to avoid confusion with Ma Huan's document.

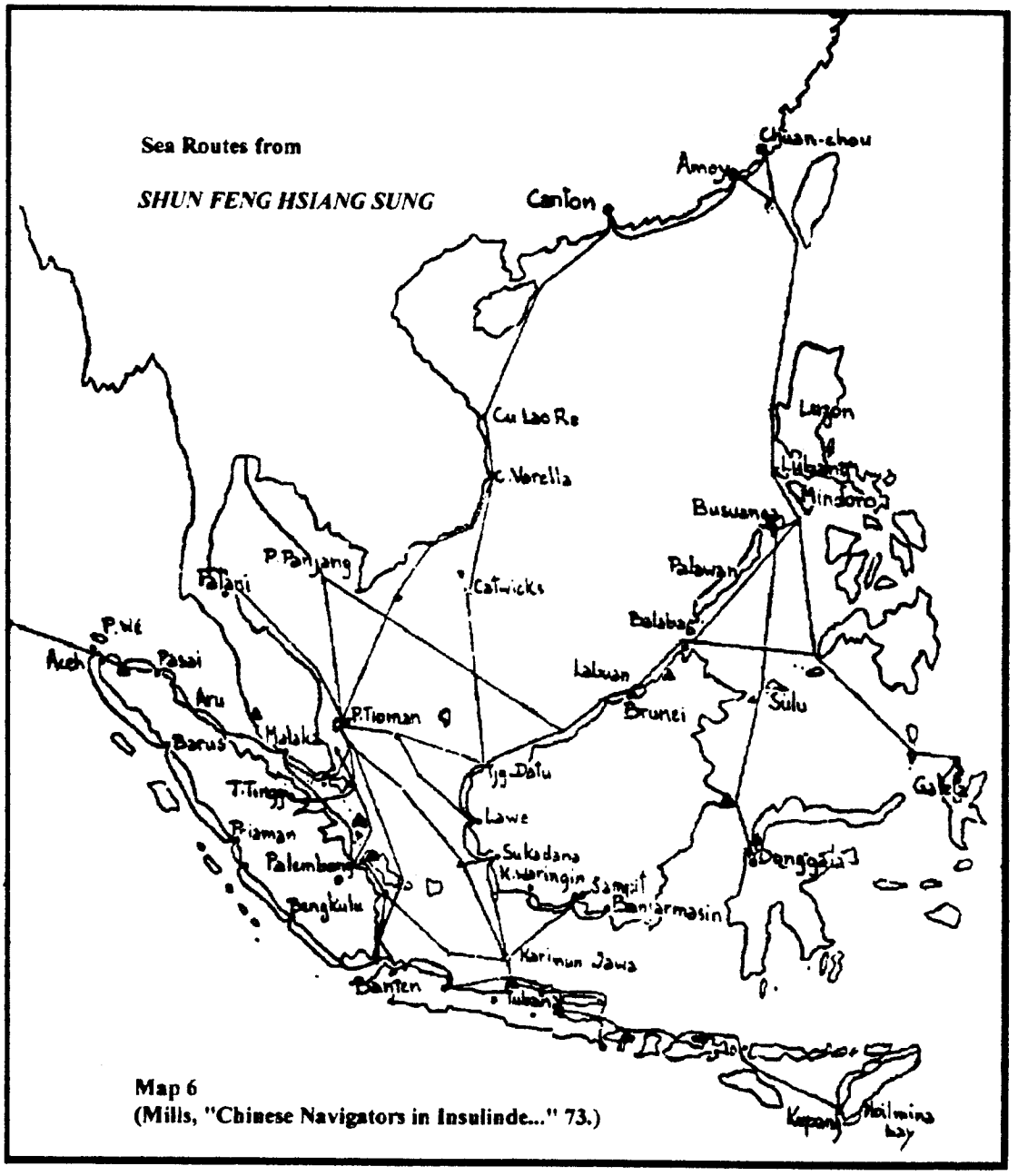
[2]Within the table, any entry including a highlighted Chinese place indicates familiarity by 1430 C.E. if not earlier.

[3]Mills, *Triumphant Tour,* 239.

[4]Namely Bretschneider, Chang Hsieh, Duyvendak, Fairbank and Teng, Feng Ch'eng-chun, Fuchs, Gibb, Grousset, Hirth and Rockhill, Hsiang Ta, Huang Sheng-tseng, Kuwabara, Le Thanh Khoi, Lu P'an



Map 5: Mao Kun Chart Section (Needham, *Civilization in China*, 560.)



Map 6
(Mills, "Chinese Navigators in Insulinde..." 73.)

Several other important documents contribute to the list of significant locations. Translation of passages from the *Shun feng hsiang sung (Fair wind for Escorts)*, a pilot's manual from the early fifteenth century, occur in several texts.[5] The introduction describes the intent behind this nautical compendium.

> In bygone days, the Duke of Chou discovered and worked out the principles of the south-pointing needle. Throughout the centuries from ancient times until today, these principles have circulated far and wide. Yet if you ignore the increase or decrease in the number of watches, or their divisions, you will be at fault. Thus it was that charts were drawn, and all details of voyages recorded.
>
> Now these old documents get worse worn every year, and it is difficult to judge from them what is the truth of the matter. If later people make copies from these originals, they will, I fear, fall into error. (So) availing myself of leisure, I have made a comparison of the calculated (number of) watches for every day, and have investigated the respective (number of) days for (each) through voyage. And I have collected and written down the number of the watches, the directions of the compass-needle, the appearances of mountains and the conditions of the water, whether there are bays and islands, shoals and deeps; with regard to all the places from the directly governed (district) of the Southern Capital (Nanking) to Thai-Tshang and Wu-Li-Yang (the Gulf of Siam, the Sumatran Seas and the Indian Ocean) (where are) the barbarian countries and other such places--in order to hand down to later generations the way and manner of making good voyages.[6]

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and Lu Ch'eng-en, Mao Yuan-i, Pao Tsen-peng, Pelliot, Schrieke, Smith, and Wheatley; see Mills, *Triumphant Tour*.

[5]Most cite Schrieke or Mills in this context. The manuscript resides at the Bodlian Library, land MS number 145. See J.V. Mills, "Chinese Navigators in Insulinde about A.D. 1500," *Archipel*, vol.18(1979), 69-93.

[6]Needham, *Science and Civilization in China*, vol.4, 582. This quote is from the introduction section of *Shun feng hsiang sung*.

While many locations in both the Mao Kun and the *Shun feng* maps are identical, the *Shun feng* version contains many other sites not mentioned in other period sources. Generally attributed to *circa* 1430 C.E., this compendium also contains information from a much later date (possibly seventeenth century) and must be used only with careful cross-referencing to other sources.[7] In general, the Mao Kun map (contemporaneous with the *Shun feng hsiang sung*) focuses on the Ming voyages through the Southern Seas to distant western lands, while the *Shun feng* includes broad nautical information limited to the Southeast Asian region. Additionally, the Ming Shi Lu histories and the trade report of Song dynasty official Zhao Rugua, both mentioned previously, aid in site identification.

First-hand reports from participants in the southern trade provide further information on the location of significant sites. The best known of these, Ma Huan's *Ying yai sheng lan (Triumphant Tour of the Ocean's Shores)*, records the sailing directions and harbor descriptions of Zheng He's fourth and sixth missions through Southeast Asia.[8] Fei Xin, a soldier from the coastal garrison of Liu-chia-chiang who participated in the missions, also left a travel document of his voyages, the *Hsing-ch'a sheng lan (General account of the Ocean's Shores)*.[9] Though some of the information appears to be a duplication of Ma Huan's work, other passages provide original additions to the itinerary. The combination of eyewitness reports

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[7]Mills, "Chinese Navigators in Insulinde," 71. Table citations of *Shun feng hsiang sung* refer to Mills' extensive translations.

[8]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 12-14. Map references to Ma Huan represent Mills' translations.

[9]Information on this book, included in Groeneveldt, *Notes on the Malay Archipelago*, is also recorded in Goodrich and Chao, *Dictionary of Ming Biography*, 440. Map references to Fei Xin refer to Groeneveldt's translations of primary sources.

and primary maps makes an accurate estimation of important trade ports and other site locations possible.

Modern archaeological investigations are also represented, but only where they relate directly to historic Chinese maritime trade in the region. These references, such as John S. Guy's important work on ceramic sites throughout Southeast Asia, often represent a much larger field of study than the portion of information used here would indicate. These works are very important in the sense that they can be related to the historic trade of the region. Citations refer to the individual authors of articles or books; complete information can be gathered from the bibliography. This is where archaeology meets history in Southeast Asia. Notes on important correlations between historic investigation and archaeological evidence for each country follow the name/location table.

1. Maritime Sites: Limitations

Many problems plague the task of accurately locating the historic ports and landmarks. One of the drawbacks of the Chinese system of tributary trade was the lack of communication between China and the vassal states. On several instances, Chinese envoys proceeded south with an inaccurate understanding of the dynamic changes which had occurred in Southeast Asia since their last contact. For instance, Java was unified by Xi Wang, King of West Java, in 1407. Previously, rulers of both East and West had attempted to outbid each other for the Emperor's favor. Zheng He's envoys, unaware of the change of events, landed on territory controlled by the deposed eastern ruler. Xi Wang's forces killed 170 Chinese.[10]

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[10]Chiu Ling-Yeong, "Sino-Javanese Relations," 218.

The Emperor demanded reparations which were never fully repaid. As Java was the strongest state and key to Southeast Asian pacification, China had good reason to treat Java as favorably as possible.[11]

Rulers and kingdoms change, place names change, and important trade sites sometimes come and go. Chinese navigators had their own names for locations in Southeast Asia, places which often were called something different by the inhabitants. The exact translation of historic Chinese characters into one of several styles of transliterated English proves difficult enough. The modern names for settlements, if any still exist at the historic sites, can be something completely different again. Added to these semantic problems, rivers migrate through time, bays and estuaries fill in, and landmarks such as cliffs can disappear. Often, several cross-references to different sources must be combined to provide a best estimate of the location of a particular site.

Confusion over names exists at the international level as well. Countries are listed by their modern names, most recognizable to Westerners. Of course, during the period of maritime expansion, states were known by very different appellations. For instance, "Vietnam" refers to the Kingdom of Champa, located in the central eastern part of the peninsula. Annam, the northern part of today's Vietnam, is not listed. During the early Ming dynasty Annam was occupied again (temporarily) by Chinese forces, and nominally a part of China itself.[12]

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[11] *Ibid.*, 219.

[12] Indeed, Tungking and Annam, until approximately 1000 C.E., were considered part of 'colonial' China. Victor Purcell. *The Chinese in Southeast Asia* (London, 1966), 181.

Table 7: modern vs. historic state names, Southeast Asia

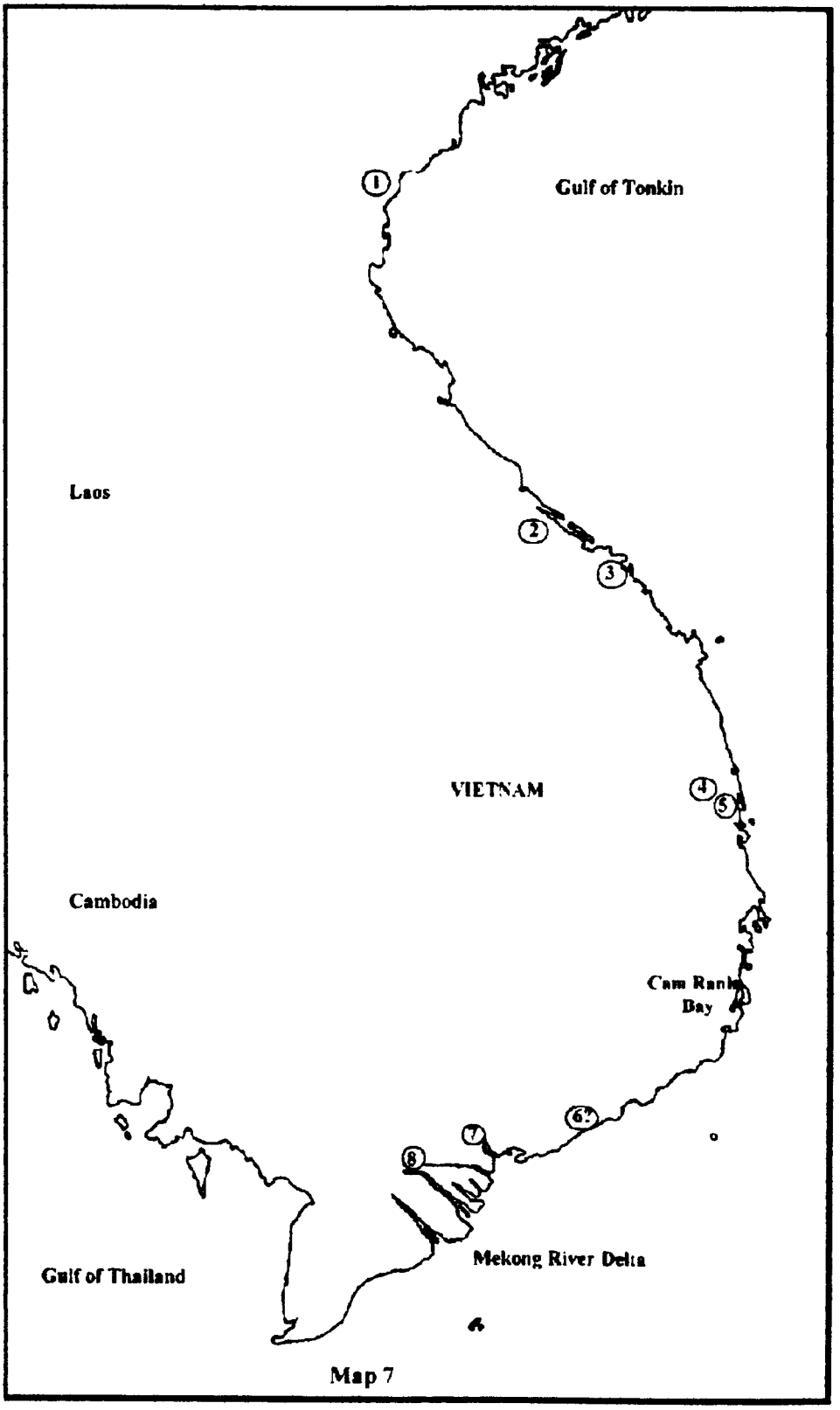
modern designation	name during maritime period
Vietnam	Champa, central Vietnam (Chenla, South Vietnam)
Philippines	Pangasinan
Borneo	Poni, especially Brunei region
Thailand	Xian loguo, excluding southern peninsula
Malaysia	Man lajia, Kedah
Sumatra	San fochi, Acheh, Lambri, several separate countries
Java	Zhao wa, extending east to Timor
Burma	Li tai

These Southeast Asian locales and the marine highways which led between and past them are directly related to the physical remains of Chinese maritime expansion. Ships and port services throughout the region, as a phenomenon of human behavior over a period of several centuries, must have left behind associated artifacts which, if preserved under favorable conditions, remain to be found. These sites are the legacy of the Chinese people, more specifically the maritime populations of China's southern coast. The skills and shipbuilding technology of the people from Fujian, Guangdong, and Zhejiang, opened the Southern Seas (NanHai) to a flood of emigration, forever changing the nature of Southeast Asia.

B. Sites by Country

Table 8: Vietnam

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Ch'ing hua chiang (Anchorage of Ch'ing hua) Lach Chao river mouth, North Vietnam	19*46' N		Mills et al p191
2. Shun hua chiang (Anchorage of Shun hua) Hue, central Vietnam	16*30' N, 107*35' E		Mills et al p217
3. Kuang nan chiang k'ou (Kuang Nan anchorage mouth) Fai Fo estuary, Vietnam	15*53' N		Mills et al p201
4. Chan ch'eng Cham capital known as Vijaya	15 miles NW of Qui Nhon	First foreign station called on during early Ming voyages west. Also the site of one of the unsuccessful Mongol punitive expeditions of 1281.	Mills et al p185 Su Chung-jen 1967
5. Hsin chou chiang (New Islet Anchorage) Qui Nhon port; Vietnam	13*46' N	major port for Champa. anchorage for trips to Vijaya?	Mao Kun p274
6. Shang la chiang (anchorage) west of Point Ke Ga, central Vietnam (Song Dinh estuary?)	107*46' E (?)	Access (along with Chan la and Pa k'ai) to state of Chen-la.	Mills et al p215 *Shun feng...*p75
7. Chan la chiang (Chan La Anchorage) Song Soirap; South Vietnam	10*35' N	Song dynasty partisans, following the Mongol invasion late 13th c, fled in large numbers to Cambodia, possibly through this or immediate neighboring ports.	Mao Kun p275 Mills et al p185 Purcell 1965 p182
8. Pa k'ai chiang (Eight Openings Anchorage) junction of Song Soirap and Song Vaico; South Vietnam	10*29' N, 106*43' E		Mao Kun p275 Mills et al p185


Gulf of Tonkin
Laos
VIETNAM
Cambodia
Cam Ranh Bay
Gulf of Thailand
Mekong River Delta
1
2
3
4
5
6
7
8

Map 7

The ancient ports of trade with Vietnam, serving as contact points for the kingdoms of Champa and Chenla, represented some of the closest maritime ties (other than Korea) to the Chinese navigators. Except for the excavation of a late seventeenth century lorca off the shores of Southern Vietnam, though, no other related maritime sites have been reported.[13]

Table 9: Philippines

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Tan shui chiang (Fresh Water estuary) anchorage, NW tip Luzon (southern part Bangui Bay?)	18*32' N, 120*46' E		Mills et all p221
2. Mi lu o (anchorage) NW tip Luzon (cove north of Burayoc point in Bangui bay?)	unspecified		Mills et al p207
3. Mi yen chiang (anchorage) NW tip of Luzon, Bangui Bay?	18*34' N, 20* 43' E		Mills et al p207
4. Ta chiang (Great Anchorage) Port San Vicente, between Luzon and Palaui island	18*30' N, 122*08' E		Mills et al p219
5. Tai mei chiang (Tortoise-shell Anchorage) Agno river estuary, Lingayen gulf, west coast Luzon	16*03 N, 120*08' E	Song and/or Yuan dynasty ceramics discovered in the vicinity.	Mills et al p220 Locsin 1967

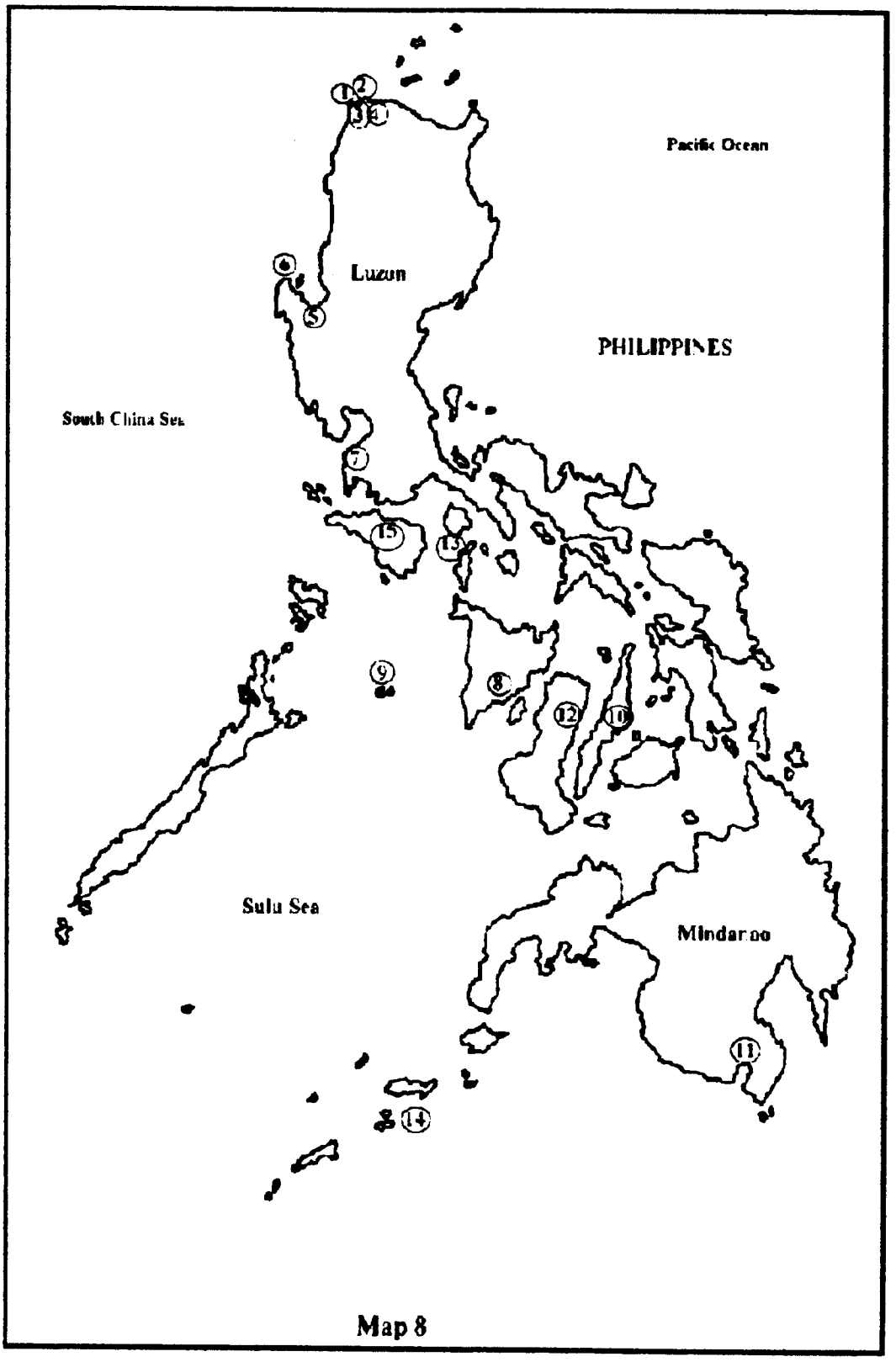
[13]Michael Flecker, "Excavation of an Oriental Vessel of *c.* 1690 off Con Dao, Vietnam," *International Journal of Nautical Archaeology*, vol.21 no.3(1992), 221-244.

6. Ma-li-lao hsu Bolinao, or Santiago Island, west coast of Luzon	16*23' N	Bolinao site at entrance to Lingayen gulf revealed scattered sherds from reef shipwreck. Bolinao 2 site (nearby) is stone anchor stock, type known in China, Korea, and Japan--common during Song period. Numerous Song period coins have been recovered from Bolinao.	Mills et al p205 Clark et al 1989 Fox 1967 p43
7. Mo-lao-yang chiang (Anchorage of Balayan) west coast Luzon	13*56' N, 120*44' E	Extensive Song, Yuan, and Ming dynasty ceramics discovered near Balayan. Catalagan peninsula features one of the largest concentrations of Chinese artifacts and trade ceramics in the country, most excavated from grave sites.	Mills et al p208 Locsin 1967 Fox 1967 p46
8. Wu-tang chiang k'ou (Anchorage of Oton) south coast Panay island	10*42' N, 122*29' E	Song and Ming dynasty ceramics at sites.	Mills et al p226 Locsin 1967
9. Kao-yao chiang (Anchorage of Cuyo) Cuyo Island,	10*51' N, 121*01' E	Ming dynasty ceramics found on tiny Cuyo island.	Mills et al p199 Locsin 1967
10. Cebu, Cebu Island	10*18' N, 123*54' E	Large concentration of Tang, Song/Yuan, Ming, and Annamese ceramics on island. Some speculation that city of Cebu is ancient trading port Ma-yi.	Locsin 1967 Echevarria 1975
11. Wang ken chiao lao chiang (Old anchorage of Wang) Sarangani Bay?	5*50' N, 125*07' E		Mills et al p225
12. Buluanga Island (Anchorage) Coron Bay (?)	unspecified	Ming dynasty ceramic wares discovered.	*Shun feng*...p 73 Locsin 1967

13. Marinduque Island, Southeast coast	unspecified	Shipwreck discovered in 1982--early Ming dynasty porcelain. Excavations of Pilapil cave on the island provide extensive association of Song and Yuan sherds with local artifacts.	Ronquillo 1990 p21 Quimpo 1982 Fox 1967 p47
14. Sulu and Jolo island group, Sulu Archipelago	6*04' N, 121*00' E	Centers for China trade, pearls and sea products. Possible Sea Gypsy activity site. Ming dynasty ceramics recovered.	*Shun feng*...p 73 Mills et al p218 Locsin 1967 Fox 1967 p58
15. Puerta Galera, north coast Mindoro Island	unspecified	Shipwreck discovered 1983--Chinese ceramics. Site looted. Song, Yuan, and Ming ceramics from nearby sites on island.	Ronquillo 1990 p21 Locsin 1967 Clark et al 1989 Fox 1967 p49

Data concerning concentrations of Chinese ceramics in the Philippines must be interpreted in the correct perspective. There are thousands upon thousands of examples of Chinese trade wares in the Islands, the product of centuries of flourishing trade, far beyond those listed in this overview. The purpose of this comparison is only to place those certain land artifacts in association (or not) with known historic maritime sites. Both Lingayen Gulf and Santiago Island (locations 5 and 6) represent the possible intersection of significant land sites with known historic ports and marine artifacts. The stone anchor stock found at Bolinao 2 is a common nautical artifact of the period, found throughout South China, Korea, and Japan. Many of them have been discovered in and around Quanzhou Bay, sometimes doubling as large granite benches for local villagers.[14] At Hakata Bay

[14]Qin Zhang Yang, "South-Song Stone Anchors in China, Korea and Japan," *International Journal of Nautical Archaeology*, vol. 19 no.2(1990), 113-121. See also Gerhard Kapitan, "Ancient two-armed


Pacific Ocean
Luzon
PHILIPPINES
South China Sea
Sulu Sea
Mindanao
1
2
3
4
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6
7
8
9
10
11
12
13
14
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Map 8

in Japan, the landing site of the Khan's invasion forces, these large granitic stocks are commonly called 'Mongolian anchors.' Similar stocks have been reported at Kilwa (Tanzania), Aden (Yemen), Mogadishu (Somali Republic), and Calicut (India).[15] All of the above sites were well-known to Chinese navigators of the early Ming dynasty, some serving as major ports for Zheng He's fleets, and feature large archaeological concentrations of Chinese ceramics and coins from the period.[16]

The remaining hull structure of the wrecks at Marinduque island and Puerta Galera (locations 13 and 15) does not provide enough information for a positive identification; artifacts from the cargo allow dating and place of origin estimates. The 1982 research at Marinduque island, a joint venture between the Philippine National Museum and Marine Archaeology Unlimited, Incorporated (MAUI), revealed stoneware jars and covers, porcelain plates, dishes, saucers and bowls, of the Ming dynasty, scattered 130 feet beneath the surface.[17] The 1983 Puerta Galera project, a joint venture between the National Museum and Mr. Brian Homan (an Australian diver), discovered a partially looted site in 50-80 feet of water, consisting of porcelain plates, dishes, wine jars, powder boxes, and several celadon incense burners.[18]

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stone-stocked Wooden Anchors--Chinese and Greek," *International Journal of Nautical Archaeology*, vol.19 no.3(1990), 243-245.

[15]Neville Chittick, "Stone Anchor-shanks in the Western Indian Ocean," *International Journal of Nautical Archaeology*, vol.9 no.1(1980), 73-76.

[16]Snow, *The Star Raft*, 7.

[17]For more information on this site, see E.T. Conese, *Report on marine archaeological exploration conducted on Gaspar island, Marinduque province* (Manila, 1981). Also, by same author *Secondary preliminary report on Marinduque project* (Manila, 1983).

[18]W.P. Ronquillo, "Philippine Underwater Archaeology: Present Research Projects and new Developments," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.14 no.1(1990), 21.

Figure 7: Song Anchor Stone (Qin, "Stone Anchors in China..." 116.)

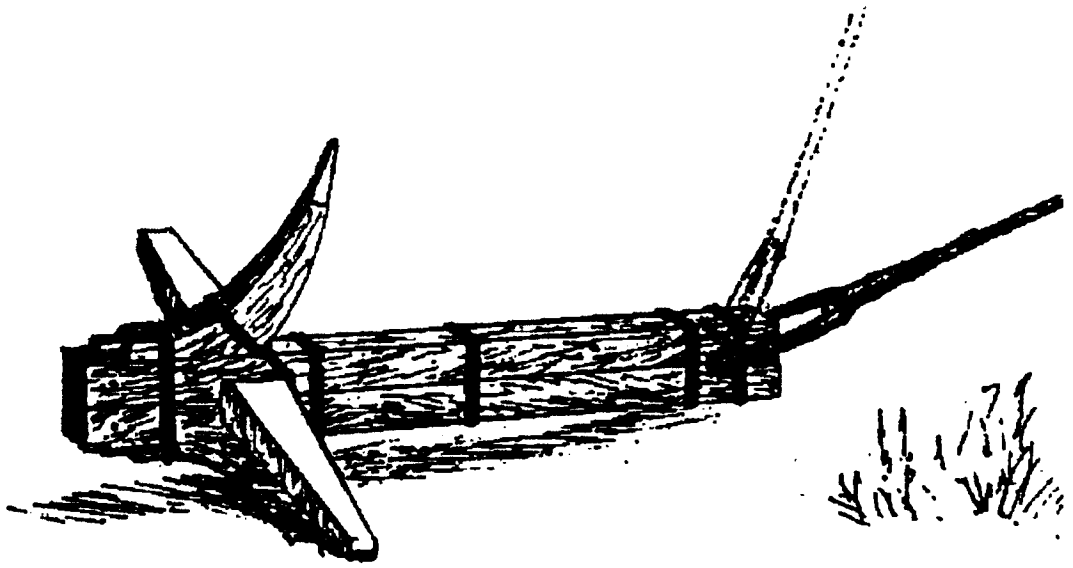


Figure 8: Anchor Reconstruction (Kapitan, "Stone-stocked Wooden Anchors..." 244.)

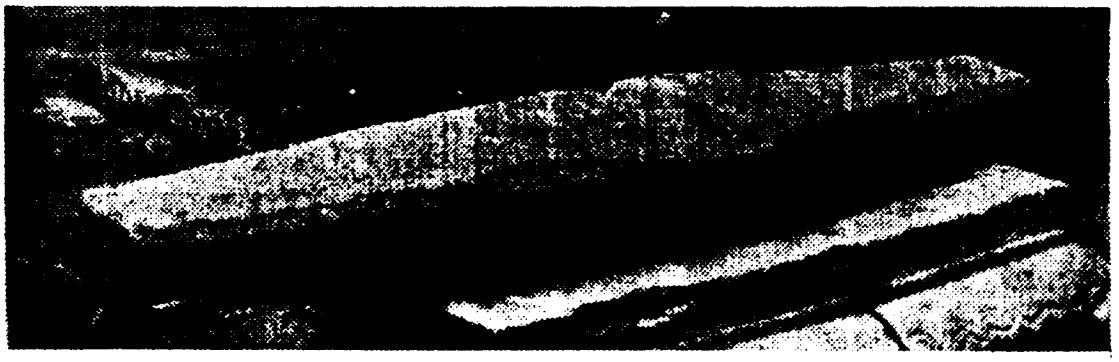


Figure 7: Song Anchor Stone (Qin, "Stone Anchors in China..." 116.)

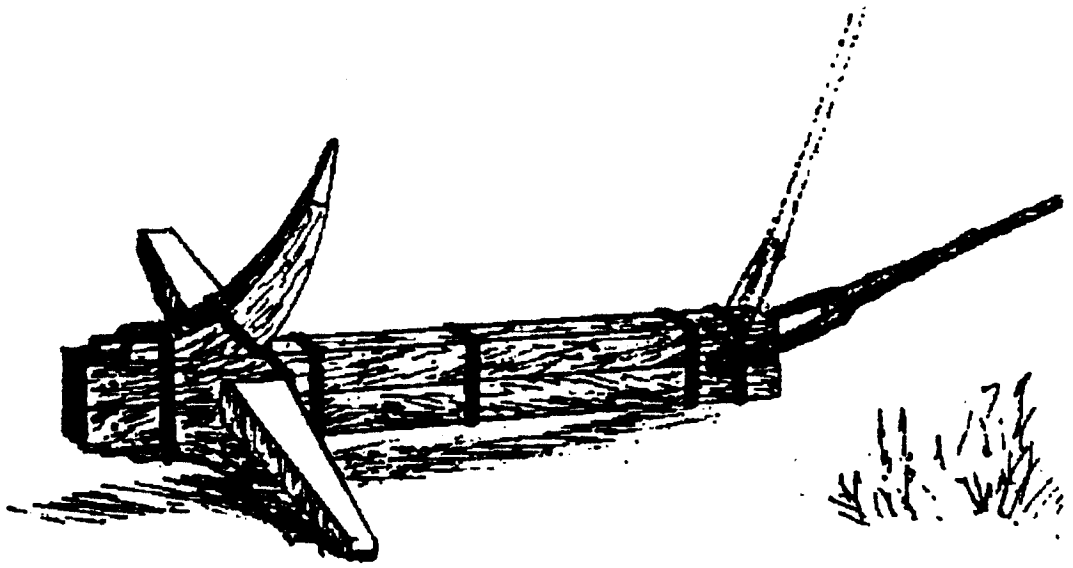


Figure 8: Anchor Reconstruction (Kapitan, "Stone-stocked Wooden Anchors..." 244.)

In 1990 a possible Song dynasty shipwreck was discovered in the Spratly Island group (exact location unspecified). By 1991 the site had been looted and blasted with explosives. No archaeological information was recovered.[19]

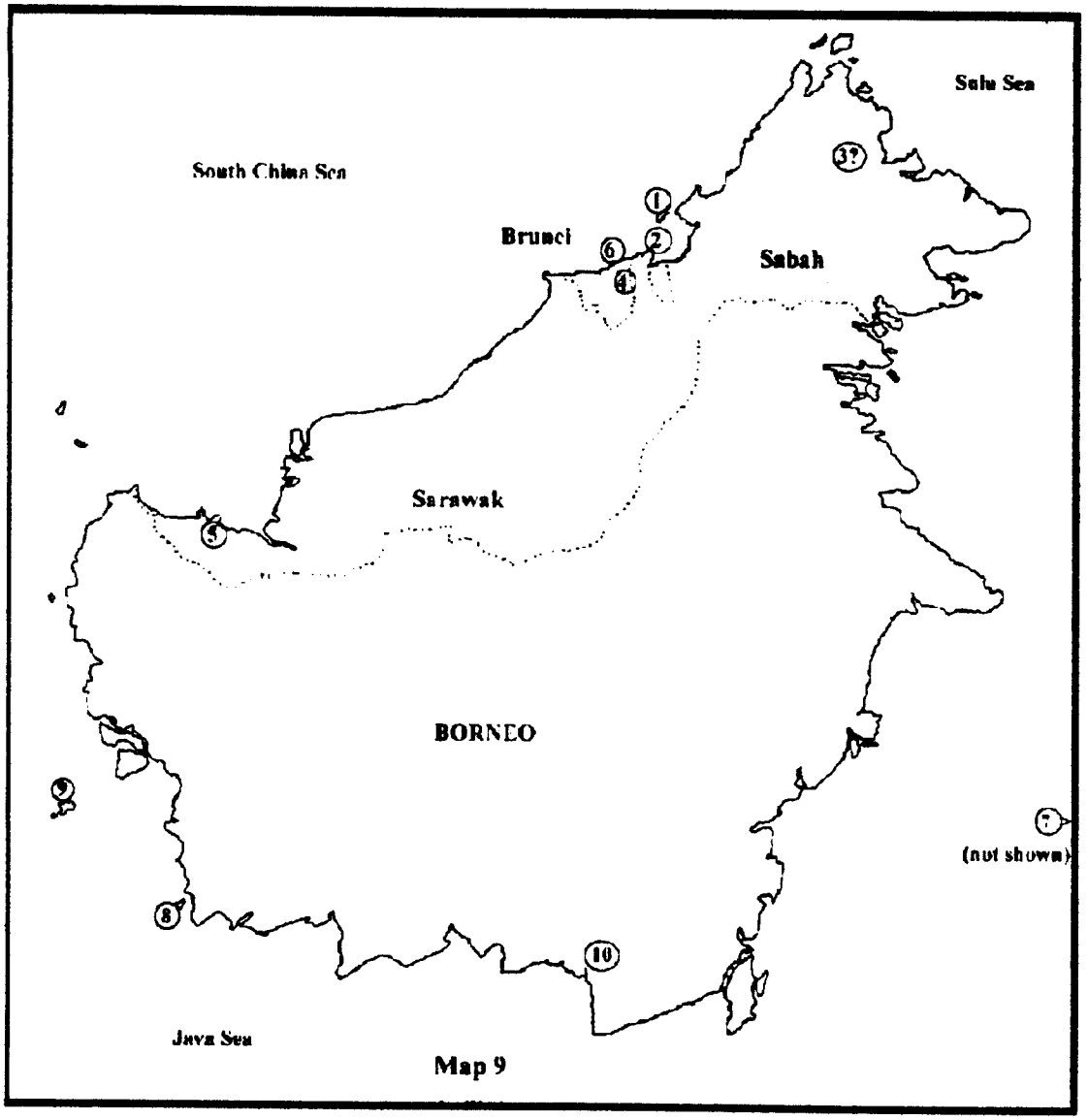
Table 10: Borneo

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Ch'ang yao hsu (Long Waist Island) Pulau Labuan	5*21 N, 115*13' E		*Shun feng*...p71-3 Mills et al p185
2. Mao-hua la Maura harbor, between Pulau Maura Besar and mainland, Brunei Bay	5*01' N		Mills et al p206-7
3. Bank of Kinabatangan, Sabah	unspecified	One battalion (?) from the Mongol punitive expedition to Java, 1292, supposedly established permanent Chinese settlement along riverbank.	Lou 1975 p24
4. Poni (also Wen-lai, or Ch'ang ning chen) later known as Brunei Town; Kota Batu, Brunei	4*53' N	Extensive trade site with China, from the 7th c on. Ming ceramics recovered. Chinese tomb of Quanzhou port official discovered 1972, dating to 1264. Earliest *in situ* Chinese inscription in Southeast Asia.	Guy 1987 p27 Franke 1989 p307

[19]Jeremy Green, "News, Australia and Southeast Asia," *International Journal of Nautical Archaeology* vol.20 no.3(1991), 256-7.

5. Shan-tu-wang Santubong; Sarawak river delta, Sarawak	near 1*33' N, 110*25' E	Important seaport, 7th to 13th c. Industrial iron-smelting site 10th-14th c, intensive trade with China. Song and Yuan wares retrieved. No Ming wares found.	Guy 1987 p21 Hsu 1978 p53 Franke 1989 p306
6. Tanjong Batu; Brunei (Tanjungbatu?)	unspecified	Song dynasty ceramics washing up on beach, assumed wreck off headlands at western tip of Brunei Bay	Guy 1987 p21
7. Donggala, west coast Sulawesi	0*30' S, 119*40' E		*Shun feng*...p71-3
8. Chiao-lan shan (or Kou-lan shan) Gelam islet, west coast Borneo	2*53' S	100 Chinese soldiers were abandoned in Gelam when their ships were wrecked by storms, Yuan dynasty period. Site mentioned as calling place for Mongol fleet of 1292.	Mills et al p189, 199 Lou 1975 p24 Chin 1981 p3-4
9. Hu-lu-man-t'ou Kepulauan Karimata	1*25' S, 109*00' E	Landing for Mongol punitive fleet on expedition to Java, 1292.	Yongle Tatian (Jao) 1967 p196 Chin 1981 p3-4
10. Mei ya jou chiang k'ou (anchorage mouth) Banjarmasin, Sungai Barito estuary, south coast Borneo	3*20' S, 114*35' E	Thriving Chinese merchant community. Many houses built on pilings over the water.	Mills et al p207 *Shun feng*...p71 Ming Shi Lu (Groeneveldt) p106

Archaeological evidence indicates that Santubong (location 5) functioned as an iron smelting and production area at roughly the same times as the development of Fujian's iron industry. Raw materials may have been transported between


Sulu Sea
South China Sea
Brunei
Sabah
Sarawak
BORNEO
(not shown)
Java Sea

Map 9

Work Chart Showing Finds

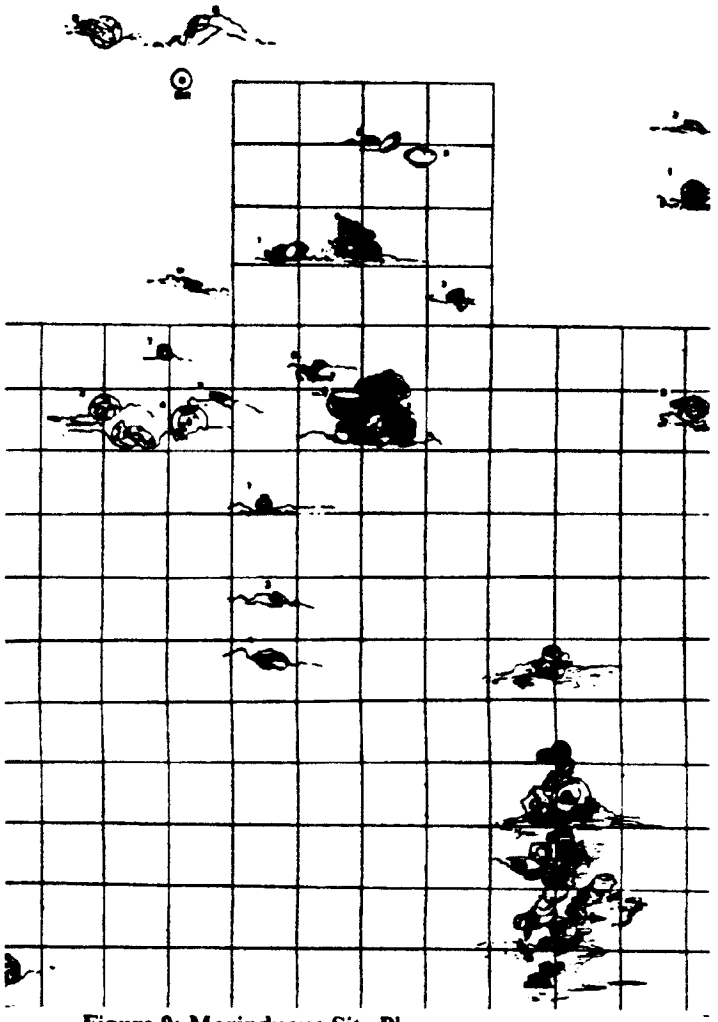


Figure 9: Marinduque Site Plan
(Quimpo and Pagan, "Shipload of Porcelain..." 39.)

Figure 10: Tombstone (Siu and Meacham, "Early Customs House..." 95.)

1,000 ships took in the voyage.[20] Part of this expedition landed in Sabah (northern Borneo) along the Kinabatangan river, settled permanently, and later adopted a Ming envoy (Ong Sum Ping) as headman. This Sabah Chinese community extended into the Sulu Islands.[21] Banjarmasin, mentioned in several official Chinese records, supported a large community of Southern Chinese traders.

Table 11: Thailand

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Shang shui (Upper water) Lopburi; Thailand	14*44' N, 100*31' E	received small vessels from Ming treasure ships for trade.	Ma Huan p105-6 Mills et al p215
2. Yu-ti-ya Ayutthaya; Thailand	14*22' N, 100*30' E		Mills et al 1970 p227
3. Hsin men t'ai (New Strait Tower) Songkhram, Mae klong river estuary anchorage; Thailand	13*21' N; Gulf of Thailand, mouth of Maenam Mae Klong	Possible landing site for trade missions to Ratchaburi (Rat Buri).	Ma Huan p102 Mills et al p197
4. Mae Klong river, Ratchaburi, northern Gulf of Thailand	13*30' N, 99*34' E	Large numbers of sherd from 10th-15th c China discovered. Possible transshipment point for re-export inland.	Ho 1991 p299

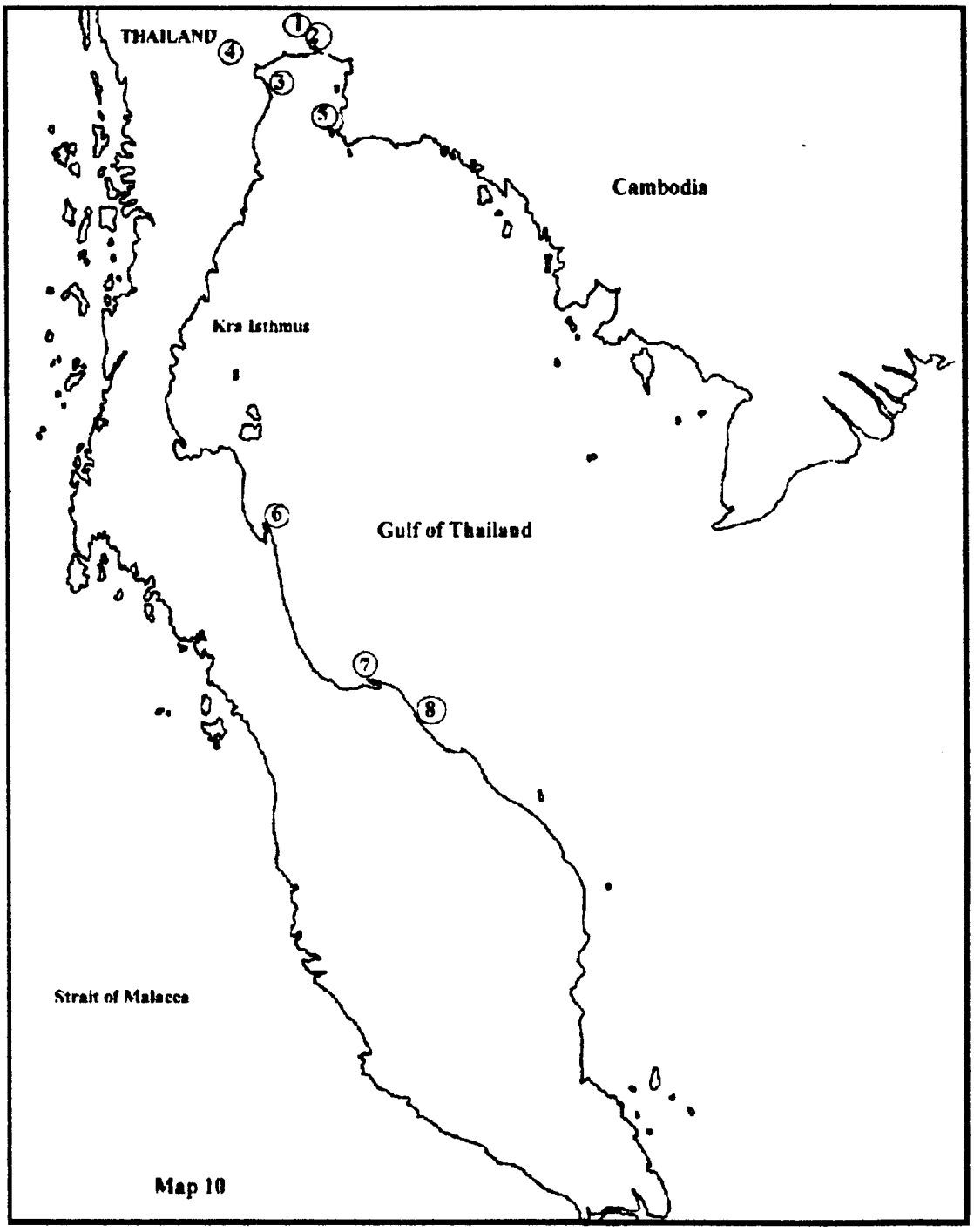
[20] *Yuan Shi*, Mongol dynastic records, as cited in Groeneveldt, *Notes on the Malay Archipelago*, 21.

[21] John M. Chin, *The Sarawak Chinese*, (Kuala Lumpur, 1981), 3.

5. Ko Si Chang, northern Gulf of Thailand	13*08' N, 100*42' E	Possible Chinese ship, designated Ko Si Chang 2 site, radio carbon date of 1290. First investigated 1982. Chinese ceramics and coins found.	Atkinson et al 1989
6. Chung pu ch'ien Hlaem Kolam spit, near Nakhon Sri Thammarat; east coast, Thai Peninsula	8*27' N, 100*11' E	Large quantity of 10th-14th c Chinese ceramics retrieved, most concentrated site in Thailand. Terminus and entrepot for distribution of Chinese goods. Shipwrecks surveyed in river tributaries nearby	Guy 1987 p19 Ho 1991 p294, 301 Mills et al p192 O'Conner 1986
7. **K'un hsia ch'ih chiang** (Anchorage at the lower stream of K'un) Also Ta-ni. Pattani Bay	6*54' N, 101*18'E		Mao Kun p277 *Shun feng*...p73 Mills et al p220
8. Hsi chiang (Hsi anchorage) Maenam Sai Buri estuary, east coast Thailand	6*42' N		Mills et al p194

Quite a few shipwrecks were investigated in the early 1980's by the joint Thai-Australian expedition in the Gulf of Thailand. Most of these lie scattered in the northeastern part of the Gulf off the shores of Pattaya and Sattahip. The ships, for the most part, appear to have been built in Southeast Asia. Only one, the remains at Ko Si Chang site #2 (location 5), features characteristic Chinese construction patterns such as iron nail fasteners, and may well represent a vessel from outside the area.[22] Extensive hull remains reveal clues about Asian ship

[22]The beginnings of a classification scheme for ship construction appear in Jeremy Green's article "Eastern Shipbuilding Traditions: a review of the evidence," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.10 no.2(1986), 2. Edge-joined dowels seem characteristic of Southeast Asian ships. The nail fasteners of the Ko Si Chang 2 site, however, are driven from the inside into the planks, and this is different from the several Chinese and Korean examples of nails being driven from the outside. Also please refer to Karen Atkinson, Jeremy Green, Rosemary Harper, and Vidya Intakosi. "Joint Thai Australian Underwater Archaeological Project 1987-1988 Part 1: Archaeological Survey of Wreck Sites in


THAILAND
Cambodia
Kra Isthmus
Gulf of Thailand
Strait of Malacca
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Map 10

construction, though the keel is missing (possibly caught up in a trawl net). The mixed cargo contains Thai and Southern Chinese ceramics. The site also experienced intensive looting.[23]

The Mae Klong river anchorage seems associated with Ratchaburi (Rat Buri) entrepot (location 4), further upriver. 'New Strait Tower' (location 3) was also known to the Chinese as 'Dragon Gate House.'[24] The Nakhon Sri Thammarat area (location 6) represents a significant intersection between historical and archaeological evidence.

Table 12: Malaysia

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Chi-ta chiang (Kedah Anchorage) Sungei Merbok river; Malaysia	entrance at 5*40'N	Major trade emporium until the 13th c.	Mao Kun p285
2. Chi-ling chiang (Klang Anchorage) Sungei Klang estuary; Malaysia	3*00'N		Mao Kun p285
3. Ch'u-ma shan (or Ti-p'an shan) Tioman Island; Johore coast, Malaysia	2*46' N	Chinese ceramics, 11th-14th c washing ashore onto two beaches. Tioman a navigational landmark and possible supply stop.	Guy 1987 p19 Mills et al p192 *Shun feng*...p71-3

the Gulf of Thailand, 1987-1988," *International Journal of Nautical Archaeology*, vol.18 no.4(1989), 305.

[23]Atkinson *et al*, "Joint Thai Australian Project," 300.

[24]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 102n.

4. Man-la-chia Malacca; Malaysia	2*12' N, 102*15' E	International entrepot following support of Zheng He's missions. Repair facilities and cantonment for Chinese vessels. Ming blue-and-white ceramics, coins etc. Kuan ch'ang, "official station" located here. Chief center of diffusion of Islam in 15th c.	Mao Kun p285 Ma Huan p108 Guy 1987 p27 *Shun feng*...p73
5. Tan-ma-hsi (Tumasik) Singapore	1*17' N, 103*51' E		Mao Kun p Mills et al p221 Fei Xin (Groenveldt) p140
6. Kuan Hsu (Official Island) Palau Tembakul, Singapore Strait	1*13' N, 103*51' E		Mills et al p200
7. Lung ya men (Dragon Tooth Strait) Coney Islet, Raffles lighthouse, Singapore	1*09' N, 103*44' E		Mills et al p204
8. Bintan, Kepulauan Riau area	unspecified	Song/Yuan period shipwreck, discovered in 1991.	Anon (IJNA) 1991 p257

In 1990 the Indonesian government issued three commercial salvage contracts to private firms for marine survey in the northern Straits of Malacca, Bangka Straits, and the area between Kepulauan Riau and Borneo.[25] The possible Song/Yuan shipwreck (location 8) represents the first historic site reported. The cargo consists mainly of Song period low quality 'kitchen' wares.[26]

Singapore, or Tumasik (location 5) as it was known then (and later to be called the 'medieval haunt of pirates') was first noted by Chinese trader Wang Ta

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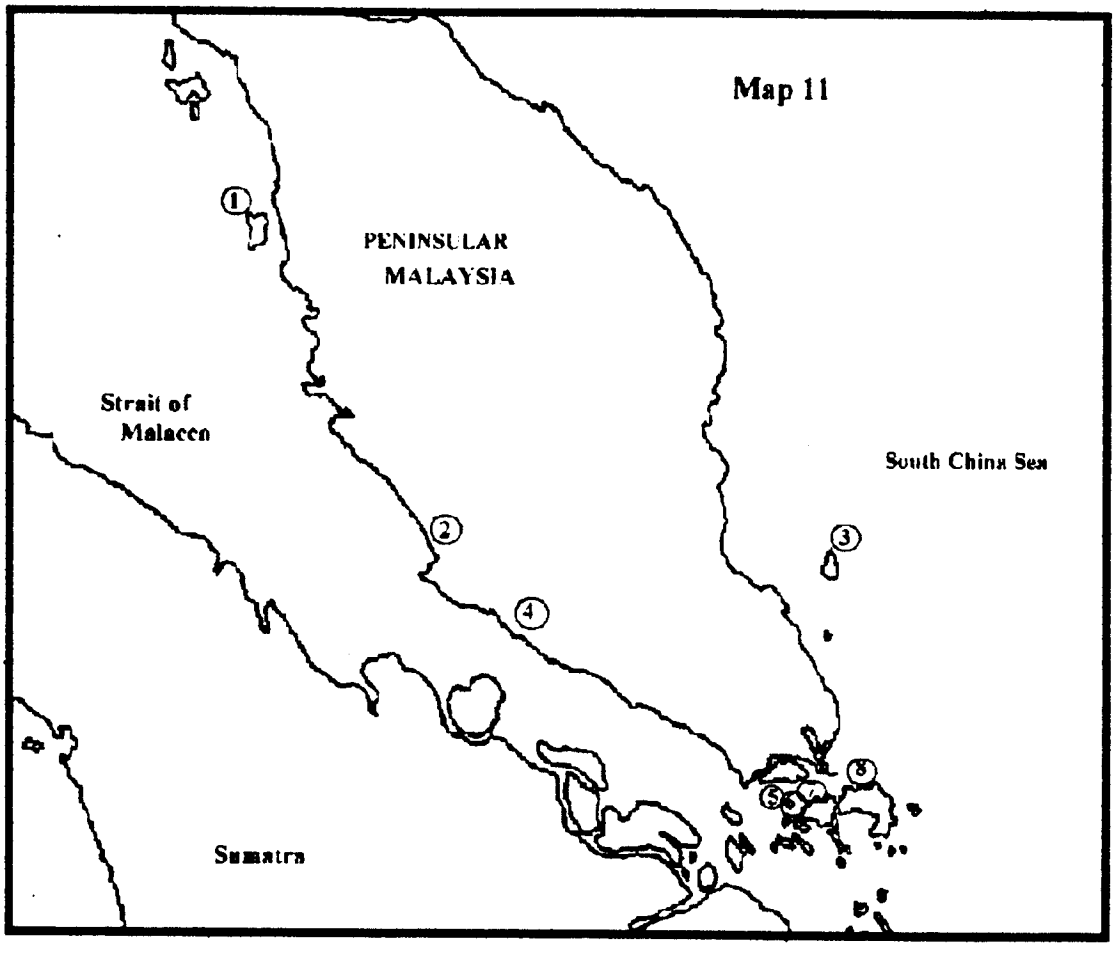
[25]Anon, "News," *International Journal of Nautical Archaeology*, vol.19 no.3(1990), 249.

[26]Green, "News," 257.


Map 11
PENINSULAR
MALAYSIA
Strait of
Malacca
South China Sea
Sumatra
1
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yuan in 1349.[27] Besieged by Xian Lo that same year, Chinese fleets brought relief to the trade port. Tumasik, thus, first received the same type of diplomatic/coercive protection later granted to Malacca. Malacca (location 4) may represent the best conjunction of Chinese historical and archaeological data.

The maritime history of peninsular Malaysia and southern Thailand extends into the past much further than the period of Chinese maritime expansion. Sites on both sides of the Kra Isthmus represent earlier entrepots of Arab-Persian trade.[28] Tioman Island (location 3), briefly mentioned in the Mao Kun map as a supply and navigational mark, appears in the *Shun feng hsiang sung* more intricately involved as a sea mark on several distinct Southeast Asian routes.

Table 13: Sumatra

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Ta yu chiang (Great Fish Anchorage) Krueng Langsa estuary, east coast Sumatra	4*33' N	Northern access to Kingdom of Aru, near archaeological sites at Kota Cina.	Mills et al p220 McKinnon 1977 p21
2. Ta-lu-man seaside village on the Krung Pasai river; north coast, Sumatra.	97*13' E	Mooring for journey to Semudera. "In the estuary the waves are large and ships are constantly sinking."	Ma Huan p116 Mills et al p219

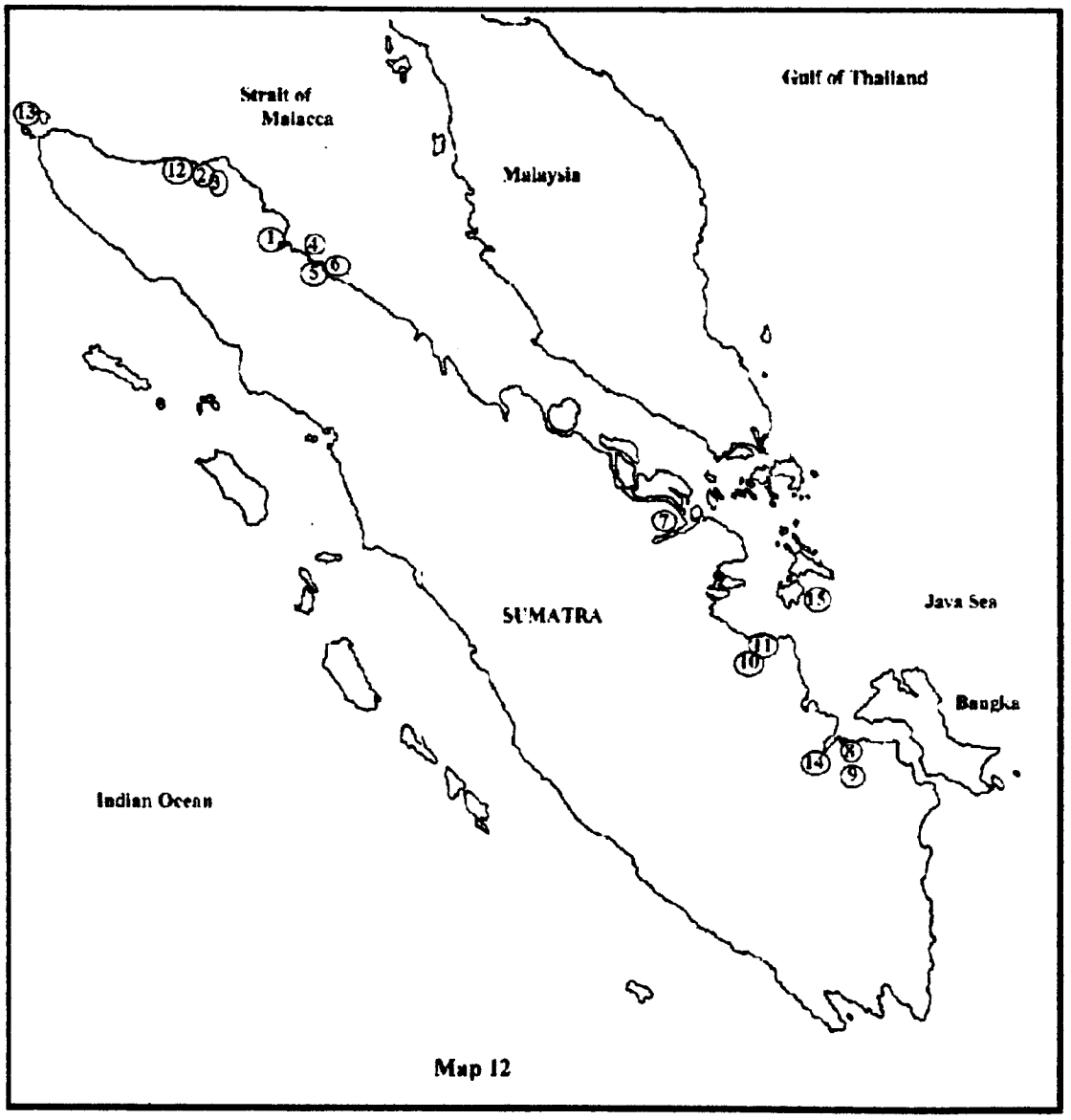
[27]Purcell, *The Chinese in Southeast Asia*, 235.

[28]John S. Guy, "Ceramic Excavation Sites in Southeast Asia: a Preliminary Gazatteer." *Research Centre for Southeast Asian Ceramics Papers 3*, (Adelaide, 1987), 15.

3. Su-men-ta-la Semudera town; Sumatra	5 miles up Krung Pasai river on west bank, nearly opposite to Pasai, entrance to river at 97*13'E	Kuan ch'ang "official station" located here. Principle entrepot for the Indian Ocean. Zheng He captured Sekandar on fourth expedition here. First center of diffusion of Islam in Southeast Asia.	Mao Kun p286 Ma Huan p115 Mills 1970 p17
4. Kan-pei chiang (Kumpai anchorage) Kumpai roadstead, east coast Sumatra	entrance at 4*11' N		Mills et al p198
5. Tan shui chiang (Fresh Water estuary) Sungai Deli estuary; east coast, Sumatra	3*37' N	Landing, capital of Aru country, neighbor to Semudera. Access to fresh water for mariners. (Today known as Kota Cina?)	Ma Huan p114 Fei Xin (Groenveldt) p93
6. Kota Cina; northeast Sumatra, slightly south of Semudera	3*33' N, 98*30'E	very active trade settlement, 12th-14th c, several sites investigated--Chinese coins and considerable ceramic remains.	Guy 1987 p20 McKinnon 1977 Ho 1991 p300
7. Kan-pa chiang (Kampar Anchorage) Sungai Kampar River; east coast, Sumatra	entrance at 0*27' N, 103*09'E		Mao Kun p284 Mills et al p198
8. Chiu chiang Palembang river entrance (Sungai Musi); Sumatra	2*20' S, 104*55' E	Zheng He defeated pirate forces of Ch'en Tsu-i in waters near Palembang, 1407. 17 ships either destroyed or captured.	Mao Kun p284 Ma Huan p98-100 McRoberts 1986

9. Chiu chiang (formerly San-fo-ch'i, then Ku-kang, Old Haven) Palembang capital; Sumatra	3*00' S, 104*45' E	Large Chinese community involved in international trade; contacts from 9th to 15th c. Important stop for tribute missions, as well as Mongol expedition of 1309. Several archaeological sites investigated: Air Bersih probably main Chinese colony. Many inhabitants living in houses (rafts) above the water.	Mao Kun p284; Ma Huan p98-100 Guy 1987 p15 Bronson 1976 Wolters 1975
10. Maura Kumpeh Hilir; Jambi, east Sumatra	unspecified	Settlement similar to Kota Cina; ship timbers discovered; Song and Yuan ceramic finds.	Guy 1987 p20
11. Muara Jambi; east Sumatra	unspecified	International riverine port, Song-Yuan ceramics.	Guy 1987 p20
12. Na-ku-erh Nagur; Peudada region, west Sumatra	unspecified	Auxiliary stop during Ming expeditions. Nearby Nakur mountain furnished sulfur.	Ma Huan p116
13. (Ambergris, or "dragon spittle" island) Pulau Weh; NW tip of Sumatra	unspecified	Important landmark feature for navigators returning from the West.	Fei Xin (Groenveldt) p100
14. Hsi chiang Western anchorage) Air Banjuasin, east coast Sumatra	river entrance at 104*50' E		Mills et al p194
15. Kuan Hsu (Official Island) Berhala Island, east coast Sumatra	0*52' S, 104*24' E		Mills et al p200

The northern end and the southeastern area of Sumatra have traditionally been regions of preeminent importance to the Chinese, though the *Shun feng hsiang sung* shows the location of several ports on the southwestern


Strait of
Malacca
Gulf of Thailand
Malaysia
SUMATRA
Java Sea
Bangka
Indian Ocean
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Map 12

coast.[29] The northern section, through time, has included the separate states of Aceh, Aru, and Lambri (locations 1-6).

The southwest, during the Ming expeditions, was nominally territory under Java. The pirate Chen Cui took advantage of Java's weak hold on Sumatra (until captured), heading a Chinese community from Guanzhou and Quanzhou (location 9) which, according to official records, preyed on native merchants and international shipping in the area.[30] Many inhabitants lived directly on the water.

> The country is rich in water; only the chiefs live on the island, whilst the common people dwell on the river; for this purpose they build their houses on rafts, which are fastened to poles in such a way that, when the tide rises, the rafts are lifted up without being flooded. When they want to remove to another place, they have only to pull up the poles, which does not cost much money or labour.[31]

The Kota Cina area (location 6) appears to be synonymous with several historic Chinese anchorages, namely the Sungai Deli estuary (location 5). These sites, along with Palembang, provide both historic and archaeological evidence of Chinese activity in the region.

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[29]Mills, "Chinese Navigators in Insulinde," 73.

[30]The Ming dynasti records, cited in Groeneveldt, *Notes on the Malay Archipelago*, 71.

[31]*Ibid.*, p72

Table 14: Java

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Tu-pan Tuban; Java	6*50' S, 112*04' E	Principle port serving Majapahit empire. 14th and 15th c ceramics retrieved from offshore localized area. Site of Mongol punitive raid, 1292. Possible wreck site (or lightening anchorage) located offshore.	Ma Huan p86 Guy 1987 p26 Yuan Shi Lu (Groenveldt) p20-5
2. Su-lu-ma-i Surabaya; Java	7*12' S, 112*44' E	Landing, skiffs (sampans) ferried Chinese officials through estuary. Last Ming fleet anchored in the roads of Suryabaya March-July, 1432.	Ma Huan p86, 90n Mills et al p218 de Graaf and Pigeaud 1984 p62
3. Man-che-po-i Majapahit; Java	35 miles SW of Surabaya (?)	landing, and capital of Majapahit empire	Ma Huan p86
4. Hsin ts'un (New Village) Gresik; north coast (Rembang district), Java	7*09' S, 112*40' E	Spice and wood port founded by Chinese between 1350-1400. Wealthy community of Cantonese, about 1000 families. Beach surface collections of Yuan dynasty and later period ceramics.	Ma Huan p86, 89n Guy 1987 p25 Ming Shi Lu (Groenveldt) p41
5. Selopuro; north coast, central Java	unspecified	river site transshipment area, Chinese ceramics 12th-14th c	Guy 1987 p20
6. Japara; north coast, central Java	unspecified	Chinese ceramics 13th-14th c, retrieved from offshore locations	Guy 1987 p21

7. Rembang district; north coast, Java	unspecified	Several sites engaged in maritime trade and major ship building activity recorded in 15th c. Yuan and early Ming ceramics retrieved.	Guy 1987 p25
8. Semarang, north coast central Java	7*00' S, 110*26' E	Major stop for Ming fleets, repairs and supplies. Large Hanafite Muslim community. Strong Muslim support for Zheng He. Shipyard possibly located on grounds of Semarang Prao Transport company. Zheng He (Sam Po) temple located in Semarang today.	de Graaf and Pigeaud 1984 p14-29.
9. Talang Village (harbor)	unspecified	Repair services available for early Ming ships. Nearby Sarindil delivered teak wood, Sembung maintained lighthouse, and Talang provided harbor.	de Graaf and Pigeaud 1984 p37
10. Demak	6*53' S, 110*38' E	Great Mosque due to style of woodwork thought to be product of Chinese shipwrights from Semarang.	de Graaf and Pigeaud 1984 p29
11. Ku-lan Belitung Island; Java Sea (specific site Ma-yi-tung, west side of island?)	3*10' S, 107*50' E	Mongol punitive expeditions driven ashore 1292(3?). Fleet rebuilt and launched against Java. Supplys for rudders, spars, masts, yards and sails located here.	Fei Xin (Groenveldt) p78
12. Kih-ri Ti-mun Timor Island	unspecified	12 mercantile ports located here; Chinese mariners contracted infectious diseases from the women at this place. The island also served as an important source for Sandalwood for several centuries.	Fei Xin (Groenveldt) p116

13. Hsia chiang (Lower Anchorage) Banten in Java	unspecified	Mills et al p196 *Shun feng*...p73
14. Chung Chia-lo Udjung Galuh (Jangala) port, Kali Mas river delta, east coast Java	7*15' S	Mills et al p192

The central northern coast area of Java, from Semarang to Surabaya (locations 8 and 2) contains most of the archaeological, historical and/or combined sites related to Chinese maritime expansion. Strangely, sources record sites from Tuban (location 1) and further east without mentioning Semarang. According to the *Malay Annals of Semarang and Cerbon*, however, Semarang played an important role to Zheng He's fleets and overseas Chinese.[32] The omission remains a mystery, as does the true nature of the shipyard at Semarang. Whether or not this site was used by Zheng He during the Ming dynasty, the location was further altered in 1942 when the Japanese constructed a shipyard for wooden vessels.[33] The possibility of terrestrial finds associated with the battles of 1293 C.E. may be close to nonexistent. Java is one of the most densely populated places on the planet, and population density often adversely effects archaeological site survivability.

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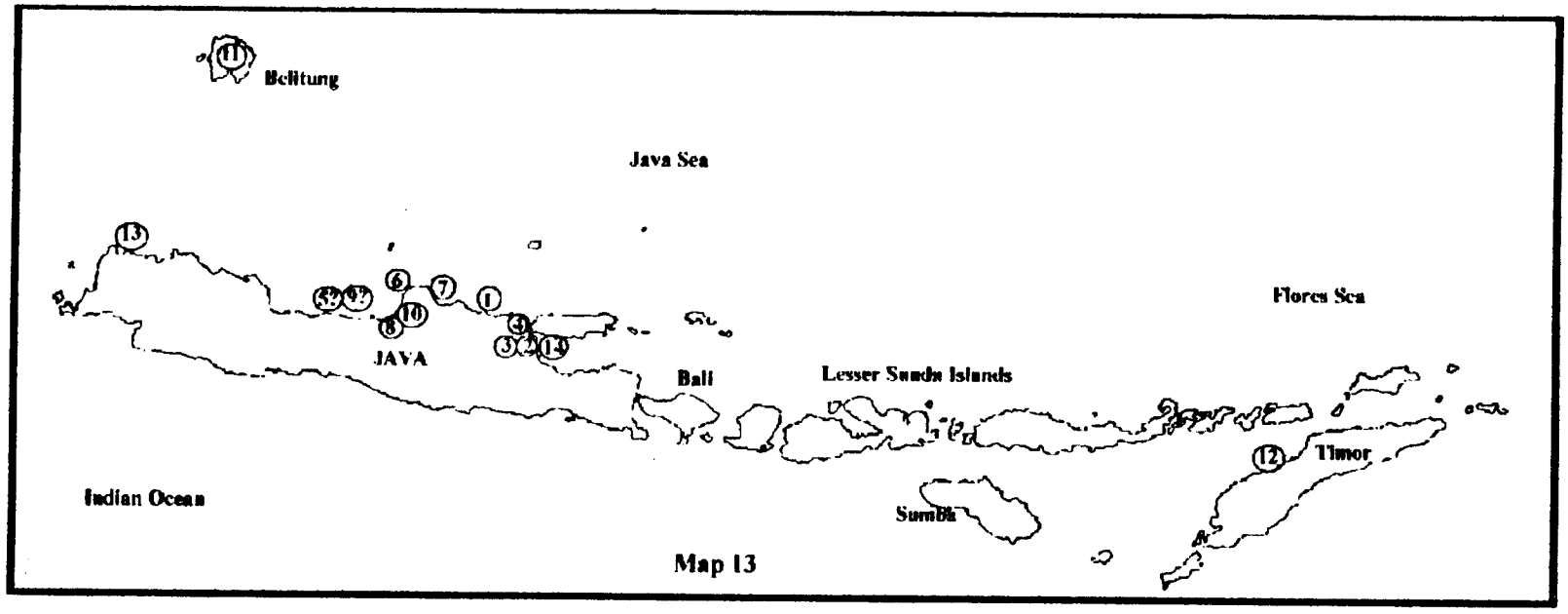
[32]H.J. de Graaf and Th. G. Th. Pigeaud (trans), *Chinese Muslims in Java in the Fifteenth and Sixteenth Centuries: the Malay Annals of Semarang and Cerbon* (Semarang, 1984). Note however, that the Annals are not considered a strictly reliable historic source, but are of slightly questionable origin. Controversy, regarding the origins of Islam in Indonesia, surrounded the initial publication; the document was banned in Indonesia.

[33]de Graaf and Pigeaud, *Chinese Muslims in Java* (editorial note), 28. Many places, both in and beyond the geographical range of this paper, likewise underwent extreme changes during the modern era. The changes associated with World War II alone would be a topic large enough for another study.


Belitung
Java Sea
Flores Sea
JAVA
Bali
Lesser Sunda Islands
Timor
Indian Ocean
Sumba

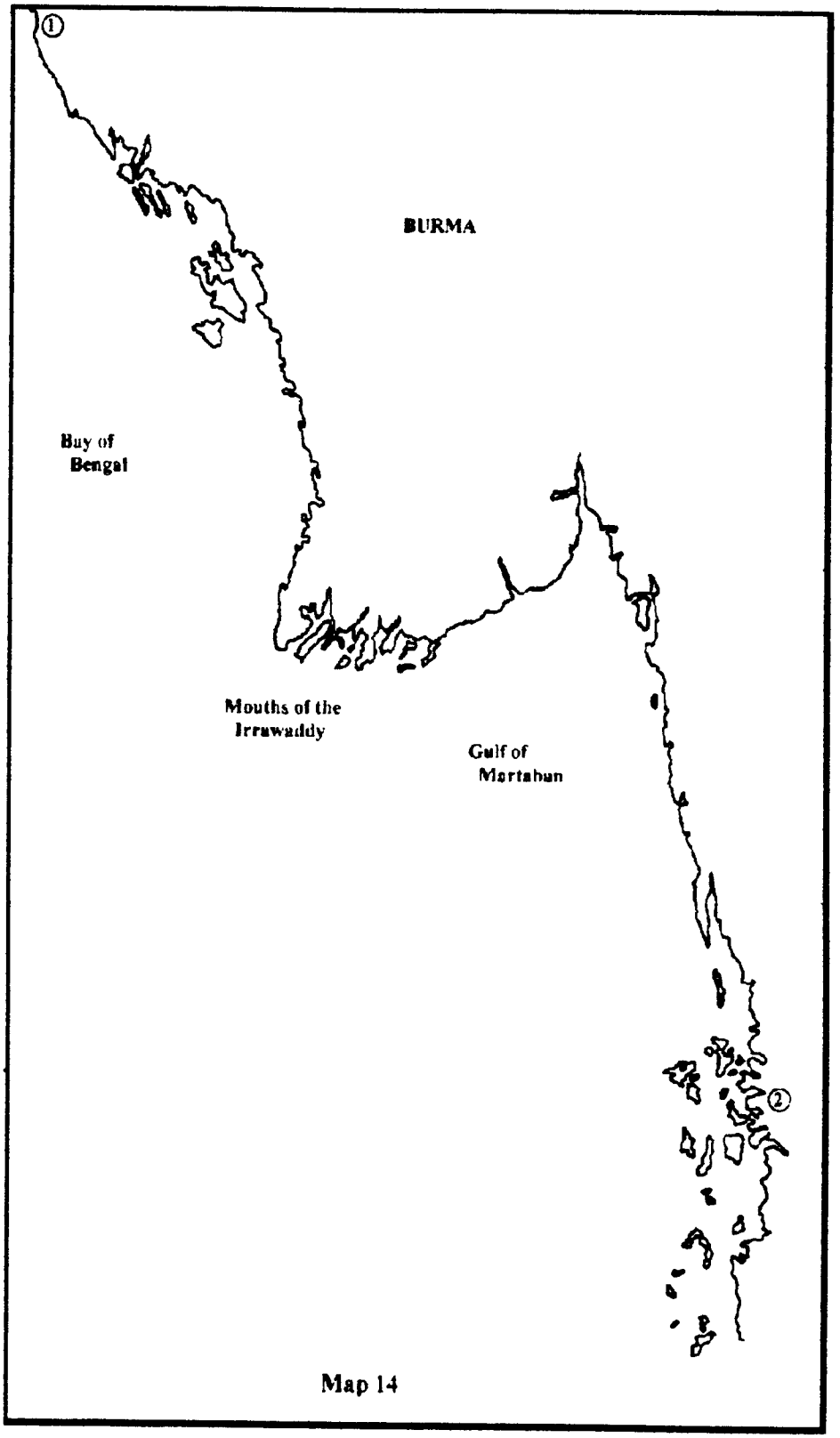
Map 13

Table 15: Burma

Chinese name/modern description	*exact location*	*historical significance Song to early Ming*	*references*
1. Mu-k'o chiang (anchorage) Baghkhali river?	entrance 21*31' N		Mills et al p208
2. Ta-na-ssu-li Tenasserim village; Mergui district, lower Burma	12*06' N, 98*51' E	Entrepot port, coastal and offshore finds of Yuan and early Ming ceramics.	Mao Kun p287 Guy 1987 p26 Colless 1969

The political and economic importance of this country receives less attention from Chinese sources during the period in question. Burmese envoys accompanied Sumatran missions to the Middle Kingdom.[34] Little other related historical or archaeological information is accessible from Burma, a country which has been closed to foreigners due to official policy and political instability.

[34]Ma Huan, *Triumphant Tour of the Ocean's Shores*, 122.


①
BURMA
Buy of
Bengal
Mouths of the
Irrawaddy
Gulf of
Martaban
②

Map 14

Chapter Six
Physical Legacy of the Maritime Period

Introduction

The long-range naval vessels and the large overseas trading ships employed by the Chinese had one requirement in common: they both had to prove seaworthy in open-ocean environments. Documentary information on Chinese oceangoing ship construction, such as ships' plans and other technical data, is extremely rare. Most of the details known today come from the limited sample of the few known Song dynasty Chinese shipwrecks. This situation mirrors Europe's own maritime documentation of the sixteenth century. The shipwrights' trade in China may have consisted of privileged information, knowledge passed on within the guild, not generally disseminated or recorded in writing. One Song period document, however, records the use of a scaled model in construction plans.

> When they began to build ships, the artisans did not know how. So (Chang) Chung-Yen made with his own hands a small boat several (tens of) inches long. Without the use of glue or lacquer it all fitted together perfectly from bow to stern. He called it his 'demonstration model.' Then the astonished artisans showed him the greatest respect. Such was his intelligence and skill.
>
> After the large ships had been built and were ready to be launched, people were to come from all the surrounding districts to drag them to the water, but Chung-Yen ordered several tens of his craftsmen to build sloping runways leading down to the river. Fresh millet stalks were collected and spread thickly on these slipways, which were supported on each side by large beams. Early in the morning, when there was a frost, he led the men to the launching, and because of the slipperiness the work was accomplished with very little effort.[1]

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[1] A Jurchin Chin document from northern China, cited by Needham, *Science and Civilization in China*, vol.4, 409.

Historical references do provide some clues to both the shipbuilding industry, the appearance of completed ships, and some secondary information on construction techniques. The following section examines ship construction during the period of maritime expansion, first-hand descriptions of ship types, and archaeological evidence from excavated examples.

A. Ship Construction Industry: Song to early Ming period

China in the eleventh and twelfth centuries saw a rapid increase in shipbuilding technology. During the late Song dynasty, the government operated 43 public shipbuilding localities, while private shipyards were more numerous.[2] The industry during the whole period of maritime expansion can be divided into government-directed projects and private construction ventures. Due to the lack of records concerning private maritime affairs, however, the public sector provides the more detailed description.

Present-day Chinese researchers interpret the public shipbuilding industry in a grim light. Coercion played a large role in recruitment of labor for building ships. Convicted criminals participated under harsh conditions, "by day hard labor, by night locked shackles, no time allowed for free movement."[3] Chinese characters were etched (tattooed) on their hands and faces for identification purposes, and they lived in controlled military style.[4] Those who fled were

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[2]Guy, *Oriental Trade Ceramics*, 18.

[3]Quote from *Sung hui-yao*, from Wan Ts'eng-yu, "The Shipbuilding Industry in the Sung Dynasty," in Douglas Merwin (translator), "Selections from *Wen Wu* on the excavation of Sung Dynasty vessel in Quanzhou," *Chinese Sociology and Anthropology*, vol.9 no.3(1977), 72.

[4]*Ibid.*, 73.

captured and punished. Feudal work conditions prevailed. People also rotated through the industry as draftees. Garrison troops and ordinary peasants were liable for recruitment. Food, money (wages), and clothing was provided to these non-convict draftees. The policy of "fair hiring," a provision allowing draftees to buy their way out of the system, offered a way out for at least some of the less-willing craftsmen.[5]

In the southern maritime provinces, private construction ventures were more numerous than government-run shipyards.[6] Private ships built in the large ports in Guangdong and Fujian were generally acknowledged as superior to northern styles, with Fujian representing the highest population of shipwrights and the most sophisticated building methods.[7] Fujianese vessels often went by the generic classification of "southern ships."[8] Quanzhou, in particular, specialized in the construction of especially large vessels.[9]

> In the south, it is the nature of wood to be near water. Therefore, among ocean-going vessels those of Fu-chien are the best; those of Kuang-tung and Kuang-hsi are second best. Boats from Wen-chou and Ming-chou (in Liang-che) are third best.[10]

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[5]*Ibid.*, 74.

[6]It may be that conditions in private yards were better than those under government-directed operations, though the materialistic interpretation of history (mentioned in chapter eight) may, it seems, be applied to both.

[7]"Seagoing ships made in Fujian are superior." Quote from *San-ch'ao pei-meng hui-pien*, in Wang Ts'eng-yu, "The Shipbuilding Industry," 76.

[8]*Ibid.*

[9]Guy, *Oriental Trade Ceramics*, 18.

[10]Lu Yi-hao, author, Song dynasty, as cited in Clark, "Consolidation on the South China Frontier," 244.

By the late Song period, government-run shipyards in Guangdong and Fujian had been eliminated, leaving craftsmen more available for the construction of private ships which might then be recruited into government service nonetheless.[11]

During the Yuan dynasty, extremely large government-directed operations furnished the labor for the construction and maintenance of the large Mongol fleets. Again, very few details of these activities show up in any documents. Song defector Liu Cheng, one of Khubilai Khan's generals, was an ardent proponant for large-scale shipbuilding programs, and may have been influential in convincing the northerners of the necessity for naval tactics in south China.[12] For the two attempted invasions of Japan in the thirteenth century, the Mongols directed Korean shipbuilding efforts, which produced 300 large transport vessels for the first and 900 for the second.[13] The proposal of a third attempt prompted resistance from Chinese and Korean shipbuilders. Presumably, in Mongol fashion, many of the features of the Song shipbuilding industry were adopted by the new leaders.

The early Ming dynasty's restrictive maritime trade policies resulted in a decline in the Chinese shipbuilding industry. At the beginning of the Ming period (including the span of Zheng He's voyages), 400 households of professional shipwrights supplied the empire with the necessary skills. By 1530 C.E., less than 100 households were left.[14] Following the end of the star raft expeditions, the small number of government transports produced proved far inferior to the private

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[11]Wang Ts'eng-yu, "The Shipbuilding Industry," 75.

[12]Rossabi, *Khubilai Khan*, 82-83.

[13]H.H. Underwood, *Korean Boats and Ships* (Seoul, 1979), 44-45. Rossabi adds 4-500 smaller vessels to the 1274 fleet.

[14]Lo Jung-pang. "The Decline of the Early Ming Navy," 162. Many of these artisans moved inland to find employment in the districts prospering from the reopening of the Grand Canal.

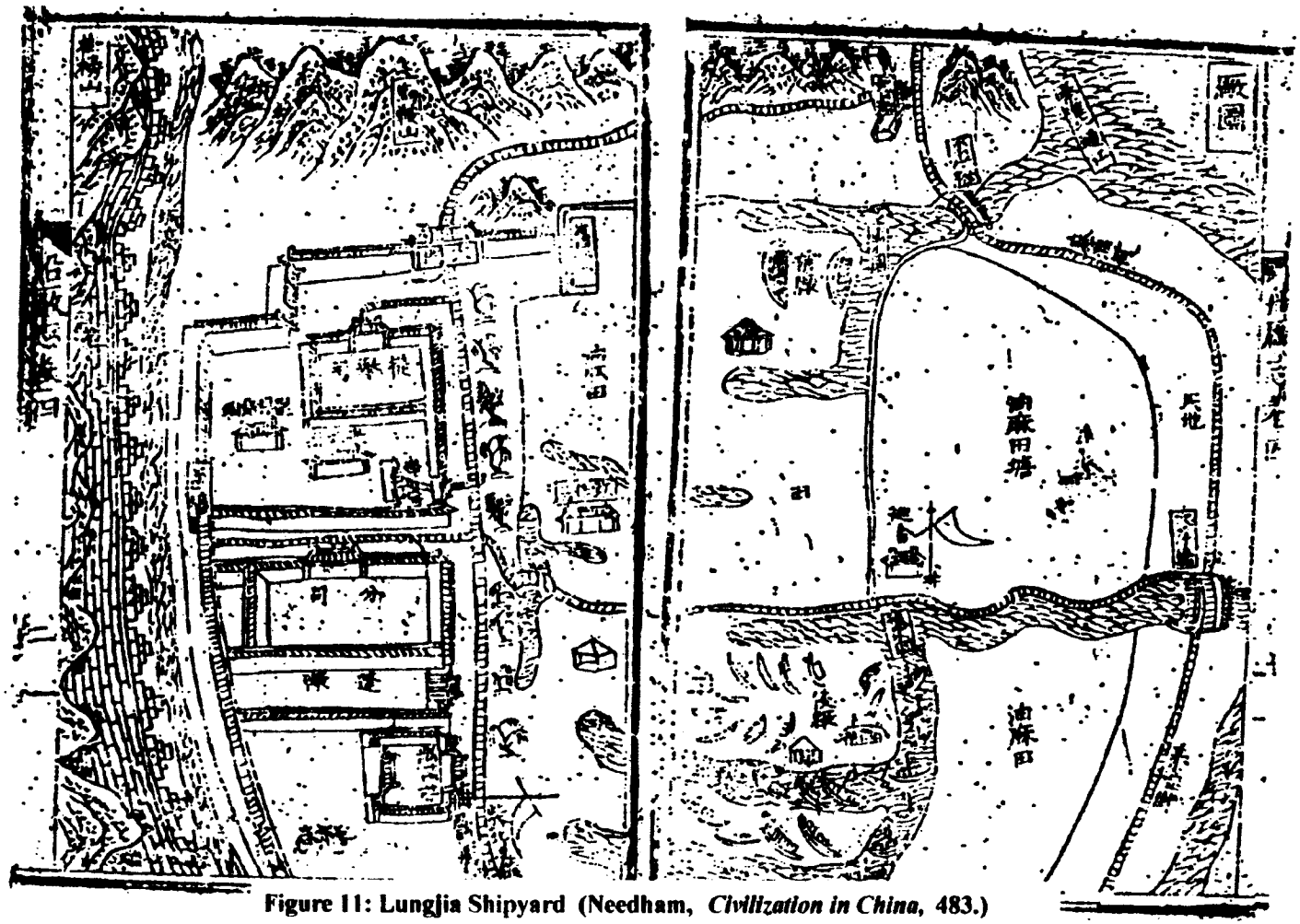

Figure 11: Lungjia Shipyard (Needham, *Civilization in China*, 483.)

merchant vessels of the past. At Lungjia jiang, the Dragon River shipyard near Nanjing, the ships produced were crude and shoddy, thinly planked, with insufficient nails and caulking.[15] Zheng He's fleets, therefore, represented the last of the technological advancement in shipbuilding begun in the Song dynasty.

B. Descriptions of Ships

Before the more recent archaeological investigations of Asian maritime history began, Western knowledge of Chinese ships was based on observations of current styles. Scholars such as Worcester and Needham and others became familiar with keel-less, flat-bottomed coastal junks, none of which were designed to be capable of sustained blue-water voyaging. Prior to recent nautical finds, the descriptions of ships recorded from the period of maritime expansion, when compared to these contemporary observations, seemed puzzling, contradictory, or both.

> The large junks in the Yuan Dynasty (*c.* 1260-1368) are said to have been of 36 ft [10.9 m] beam and with a length of more than 100 ft [30.4 m]. No writer of nautical experience has described these vessels or provided us with information on which reliance can be placed. Writers on shipping were, or seemed to be, practically unknown in those days; the few that refer to it are so inaccurate and laconic, or both, that their works have little if any real value, and so everything relating to the ships of the period is in a great degree a matter for conjecture.[16]

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[15]*Ibid.*, 159. Lo suggests that most of these shoddy craft were built from timbers salvaged from the rotting ships of the early Ming navy.

[16]Worcester, as cited by Donald H. Keith and Christian J. Buys, "New Light on Medieval Chinese Seagoing Ship Construction," *International Journal of Nautical Archaeology*, vol.10 no.2(1981), 119.

The following first-hand reports portray types of vessels previously unknown to European travelers. The enormous size and sophisticated design of the ships, the large crew and cargo capacities, even when taking into account "official" exaggerations, seemed almost unbelievable and were explained as anomalies. Though some features, like bulkheads and square transoms, still existed in modern examples, V-shaped hulls and solid keels, more appropriate for ocean-going rather than coastal vessels, had no modern counterparts.[17] Such is the long-lasting legacy of the imperial Ming Ban on maritime trade and ship construction. The ship descriptions from the Song to early Ming period are, however, beginning to find partial confirmation as nautical archaeology progresses in East and Southeast Asia. The initial assessment of maritime scholars concerning the accuracy of historic descriptions must change with these new archaeological findings (listed under individual sites layer in this chapter).

Early in the twelfth century many references already alluded to the enormous size of the Chinese ships, along with some information on the provisions.

> The ships that sail the southern sea and south of it are like houses. When their sails are spread they are like great clouds in the sky. Their rudders are several tens of feet long. A single ship carries several hundred men. It has stored on board a year's supply of grain. They feed pigs and ferment liquors.[18]

V-shaped hulls with keels proved more adapted to ocean travel.

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[17]Wang Ts'eng-yu, "The Shipbuilding Industry," 76. Song period shipwrights bluntly stated, "Flat-bottomed vessels cannot go near the ocean!"

[18]Zhou Qufei, 12th century author, Guy, *Oriental Trade Ceramics*, 19.

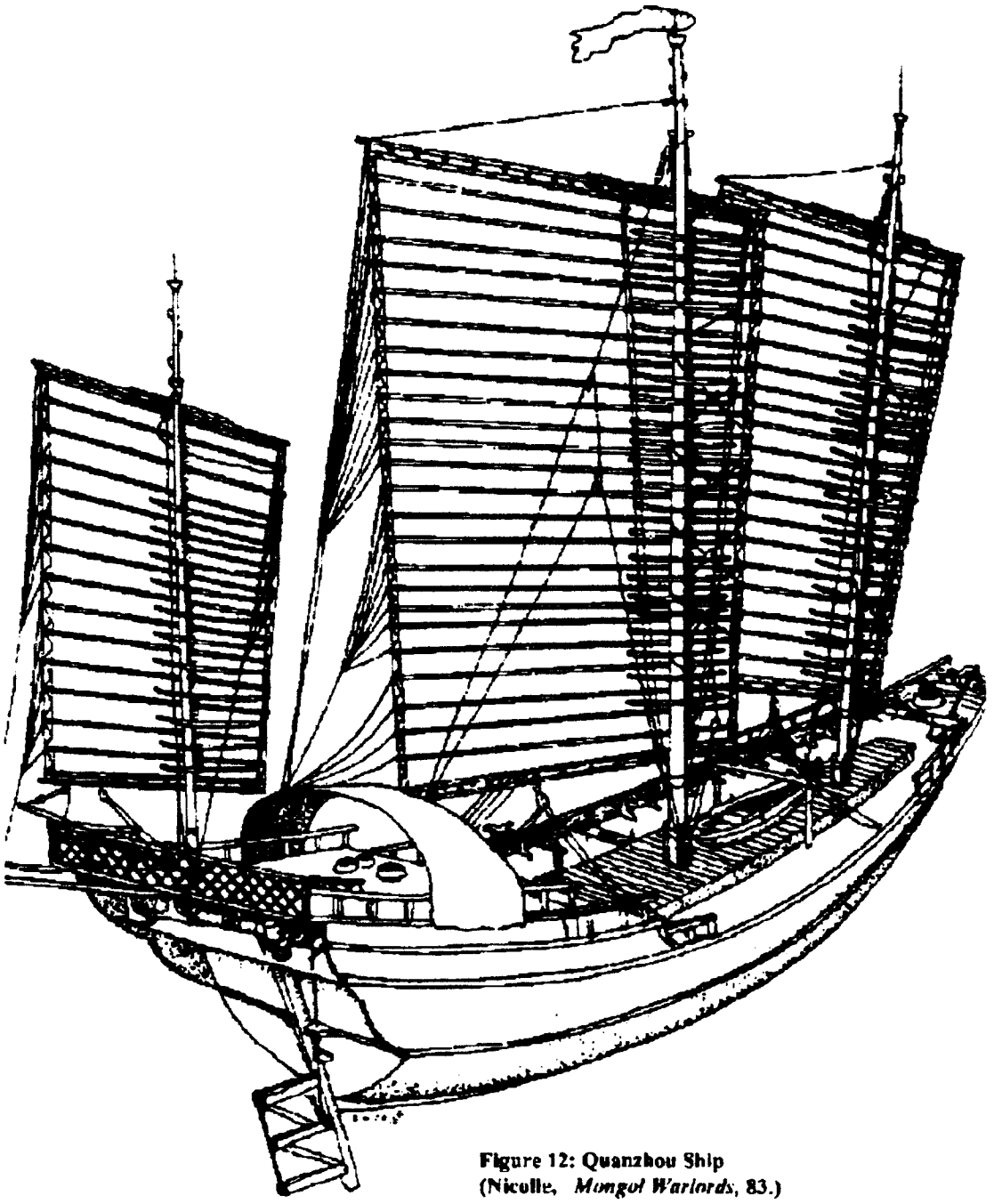

Figure 12: Quanzhou Ship
(Nicolle, *Mongol Warlords*, 83.)

> A Passenger ship...is formed of tremendous sandalwood planks shiplaped from a knife-like keel (which serves to break the waves) to her level main deck. On this passenger ship there are a foremast about ten chang in height, and a main mast about eight chang; in a favorable wind she can set 50 sheets, and if the wind is aforebeam, she can trim the mainsail, leaving both the left and right jibs open, in order to take advantage of the wind. At the top of the main mast there are ten topsails called the wild-fox sails which she uses when in the doldrums. She usually carries a crew of 60 persons.[19]

Much more detailed accounts of large seagoing ships come from foreign travelers in China during the Yuan dynasty. The best known of these, Marco Polo's report on Zayton (Quanzhou), *circa* 1292 C.E., focuses on technical details, and is here quoted in detail.

> We shall begin first of all to tell about the great ships in which the merchants go and come into Indie through the Indian sea. Now you may know that those ships are made in such a way as I shall describe unto you.
>
> I tell you that they are mostly built of the wood which is called fir or pine.
>
> They have one floor, which with us is called a deck, one for each, and on this deck there are commonly in all the greater number quite 60 little rooms or cabins, and in some, more, and in some, fewer, according as the ships are larger and smaller, where, in each, a merchant can stay comfortably.
>
> They have one good sweep or helm, which in the vulgar tongue is called a rudder.
>
> And four masts and four sails, and they often add to them two masts more, which are raised and put away every time they wish, with two sails, according to the state of the weather.

---

[19]Shee Sung, "The Contribution of Chinese Merchants to the Trade Relations between Sung China and Koryo," *Chinese Culture*, vol.18 no.4(1977), 3.

Some ships, namely those which are larger, have besides quite 13 holds, that is, divisions, on the inside, made of strong planks fitted together, so that if by accident that the ship is staved in any place, namely that either it strikes a rock, or a whale-fish striking against it in search of food staves it in...And then the water entering through the hole runs to the bilge, which never remains occupied with any things. And then the sailors find out whether the ship is staved, and then the hold which answers to the break is emptied into others, for the water cannot pass from one hold to another, so strongly are they shut in; and then they repair the ship there, and put back the goods which had been taken out.

They are indeed nailed in such a way; for they are all lined, that is, that they have two boards above another.

And the boards of the ship, inside and out, are thus fitted together, that is, they are, in the common speech of our sailors, caulked both inside and out, and they are well nailed inside and out with iron pins. They are not pitched with pitch, because they have none of it in those regions, but they oil them in such a way as I shall tell you, because they have another thing which seems to them to be better than pitch. For I tell you that they take lime, and hemp chopped small, and they pound it all together, mixed with an oil from a tree. And after they have pounded them well, these three things together, I tell you that it becomes sticky and holds like birdlime. And with this thing they smear their ships, and this is worth quite as much as pitch.

Moreover I tell you that these ships want some 300 sailors, some 200, some 150, some more, some fewer, according as the ships are larger and smaller.

They also carry a much greater burden than ours.

And formerly in time past the ships were larger than they are now at present, because the violence of the sea has so broken away the islands in several places that in many places water was not found enough for those ships so great, and so they are now made smaller, but they are so large that they carry quite 5,000 baskets of pepper, and some 6,000.

Moreover I tell you that they often go with sweeps, that is, with great oars, and four sailors row at each oar.

And these larger ships have such large tenders that they carry quite 1,000 baskets of pepper. But I tell you that they take 40, 50, some 60, some 80, some 100 sailors, and these go with oars and with sails when there is opportunity. And often again they help to tow the

> great ship with ropes, that is, hawsers, when they are moved with oars, and also when they are moved with sails, if the wind prevails rather from the beam, because the smaller go in front of the larger, and tow it tied with ropes, but not if the wind blows straight (abaft), for the sails of the larger ship would prevent the wind from catching the sails of the smaller, and so the larger would overtake the smaller. They take 2 or 3 of these large tenders, but the one is larger than the other. And of small ships which we call boats, they also take quite 10, to anchor and to catch fish and to wait upon the large ship in many other ways. And the ship carries all these boats through the water lashed to her sides outside, and when necessary they put them in the water, but they tow the two large ones astern, which each have their mariners and their sails and all that is needed for themselves and for them. And again I tell you that the said two large tenders also carry small boats.
>
> Moreover I tell you again that when the great ships wish to be decorated, that is, to be repaired, and it has made a great voyage or has sailed a whole year or more and needs repair, they repair it in such a way. For they nail yet another board over the aforesaid original two all round the ship everywhere, the one nailed above the other, and then, when it is nailed, they also caulk and oil it with the foresaid mixture, and this is the repair which they do. And at the end of the second year, at the second repair, they nail yet another board, leaving the other boards, so that there are four. And in this way they go each year from repair to repair up to the number of six boards, the one nailed upon the other. And when they have six boards the one upon the other nailed, then the ship is condemned and they sail no more in her on too high seas but in near journeys and good weather, and they do not overload them; until it seems to them that they are no more of any value, and that one can make no more use of them. Then they dismantle and break them up.[20]

Many of these technical details appear in the modern archaeological record. The group-type sailing arrangement, with smaller tenders furnishing aid to the larger

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[20]Marco Polo, cited in Needham, *Science and Civilization in China*, vol.4, 467-8.

ships, appears later in reference to the early Ming voyages. Elsewhere Marco Polo reported that the Chinese ocean-going ships had a draft of approximately 20 feet.[21]

Another traveler during the Yuan period (about 50 years after Marco Polo), Ibn Battutah, also recorded technical details of Chinese ships.

> People sail on the China seas only in Chinese ships, so let us mention the order observed upon them.
>
> There are three kinds: the greatest is called 'jonouq', or, in the singular, 'jonq' (certainly *chuan*); the middling size is a 'zaw' (probably *tshao* or *sao*); and the least a 'kakam'.
>
> A single one of the greater ships carries 12 sails, and the smaller ones only three. The sails of these vessels are made of strips of bamboo, woven into the form of matting. The sailors never lower them (while sailing, but simply) change the direction of them according to whether the wind is blowing from one side or the other. When the ship casts anchor, the sails are left standing in the wind.
>
> Each of these ships is worked by 1,000 men, 600 sailors and 400 marines, among whom there are archers and crossbowmen furnished with shields, and men who throw (pots of) naphtha.
>
> Each great vessel is followed by three others, a 'nisfi', a 'thoulthi' and a 'roubi'.
>
> These vessels are nowhere made except in the city of Zayton (Quanzhou) in China, or at Sin-Kilan, which is the same as Sin al-Sin (Canton).
>
> This is the manner after which they are made; two (parallel) walls of very thick wooden (planking) are raised, and across the space between them are placed very thick planks (the bulkheads) secured longitudinally and transversely by means of large nails, each three ells in length. When these walls have thus been built, the lower deck is fitted in, and the ship is launched before the upper works are finished.
>
> The pieces of wood, and those parts of the hull, near the water (-line) serve for the crew to wash and to accomplish their natural necessities.

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[21] *Ibid.*, 467n.

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Another traveler during the Yuan period (about 50 years after Marco Polo), Ibn Battutah, also recorded technical details of Chinese ships.

> People sail on the China seas only in Chinese ships, so let us mention the order observed upon them.
>
> There are three kinds: the greatest is called 'jonouq', or, in the singular, 'jonq' (certainly *chuan*); the middling size is a 'zaw' (probably *tshao* or *sao*); and the least a 'kakam'.
>
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>
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>
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>
> The pieces of wood, and those parts of the hull, near the water (-line) serve for the crew to wash and to accomplish their natural necessities.

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[21] *Ibid.*, 467n.

> On the sides of these pieces of wood also the oars are found; they are as big as masts, and are worked by 10 to 15 men (each), who row standing up.
>
> The vessels have four decks, upon which there are cabins and saloons for merchants. Several of these 'misriya' contain cupboards and other conveniences; they have doors which can be locked, and keys for their occupiers. (The merchants) take with them their wives and concubines. It often happens that a man can be in his cabin without others on board realising it, and they do not see him until the vessel arrives in port.
>
> The sailors also have their children in such cabins; and (in some parts of the ship) they sow garden herbs, vegetables, and ginger in wooden tubs.
>
> The Commander of such a vessel is a great Emir; when he lands, the archers and the Ethiops march before him bearing javelins and swords, with drums beating and trumpets blowing. When he arrives at the guesthouse where he is to stay, they set up their lances on each side of the gate, and mount guard throughout his visit.
>
> Among the inhabitants of China there are those who own numerous ships, on which they send their agents to foreign places. For nowhere in the world are there to be found people richer than the Chinese.[22]

Certain construction features, such as lug-sail rigs, rattan sail material, squared sterns, and water-tight compartments have always been associated with the traditional style of Chinese junk. Others, such as hull shape and vessel size, had to await confirmation from other sources.

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[22] *Ibid.*, 469.

C. Ship Construction Features: Archaeological Sources

1. Best Known Sites

Few examples of ship remains previous to the Ming Ban have been studied or even discovered. Not enough sites have been recorded to furnish an accurate representative sample of ship construction based entirely on archaeological information. What has been found, therefore, must be examined in conjunction with the historical record.

The Quanzhou ship in Fujian Province, discovered in 1973, is the premier example of Song dynasty merchant ship construction.[23] The remains lay under two meters of beach silt near Hou Zhu harbor, close to the port of Quanzhou. The ship was relatively intact up to the 14th strake on the port, and the 16th strake on the starboard, side. A solid pine keel and V-shaped hull define the ship's oceangoing design. The hull itself consists of a combined clinker/carvel strake pattern, each plank held in place by iron fasteners. The remains were over 24 meters long. The ship was double-planked up to the turn of the bilge, above which it was then triple-planked with cedar sheathing. The mastercouple, the widest section of the ship, was aft of midships. The stern was fitted for an axial rudder post (missing).[24]

Seven holes inset within the stern scarf of the ship's keel and sternpost contained a number of Chinese coins. Known as "longevity holes" (baosonkong), these were placed in the pattern of Ursa Major, the Big Dipper. Also within the

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[23]Jeremy Green, "The Song Dynasty shipwreck at Quanzhou, Fujian Province, People's Republic of China," *International Journal of Nautical Archaeology* vol.12, no.3 (1983), 253-261.

[24]Song Shipwreck (archaeological group), "The Song Dynasty Shipwreck Excavated at Quanzhou Harbor," *Wen Wu*, vol.10a(1975), 1-18.

stern scarf, a depression contained a bronze mirror, representing the Taoist moon symbol. According to local shipwrights at the excavation, the constellation pattern accompanied by the moon was a traditional custom of Chinese shipbuilding, one that existed until the founding of the People's Republic of China in 1949.[25]

Within the hull, twelve solid interior bulkheads added rigidity and protection from accidental flooding. Iron stiffeners, also called harness spikes or L-shaped brackets, secured the edges of the bulkheads to the hull. Fore and main maststeps lay directly on the keel. Chu-nam, a substance made from t'ung oil putty, lime, and fibers sealed the seams between planks and also covered the iron fasteners, protecting them from salt water corrosion.[26] The displacement of the vessel was approximately 375 tons; overall length has been estimated at 35 meters, with a beam of ten meters.[27] Dated coins place the wreck site at about 1277 C.E.

The Quanzhou ship represents the most thoroughly studied example of this type. It is possible that the vessel belonged to the fleet of Pu Shoukeng, the trade superintendent of Quanzhou at the time of the ship's demise, and an owner of a merchant fleet of over eighty vessels.[28] Turning his ships over to the Mongols instead of the aiding the desperate Song court proved to be another fatal blow to

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[25]*Ibid.*, 14.

[26]Li Guo-Qing, "Archaeological Evidence for the Use of 'chu-nam' on the 13th Century Quanzhou Ship, Fujian Province, China," *International Journal of Nautical Archaeology*, vol.18 no.4 (1989), 277-283.

[27]Restoration Group, "Preliminary Attempts at Restoration of the Sung Dynasty Seagoing Vessel in Ch'uan-chou Bay," *Chinese Sociology and Anthropology* (translated excerpt from *Wen Wu* 1975) vol.9 no.3(1977), 94.

[28]Zhuang Wei Ji, "A Research into the Ship of the Song Dynasty--Private Ship of Pu," in *China and the Maritime Silk Route* (Fujian, 1991), 344-353.

Figure 13: Quanzhou Wreck Site (Archaeological Group, "Song Dynasty Shipwreck..." 27.)

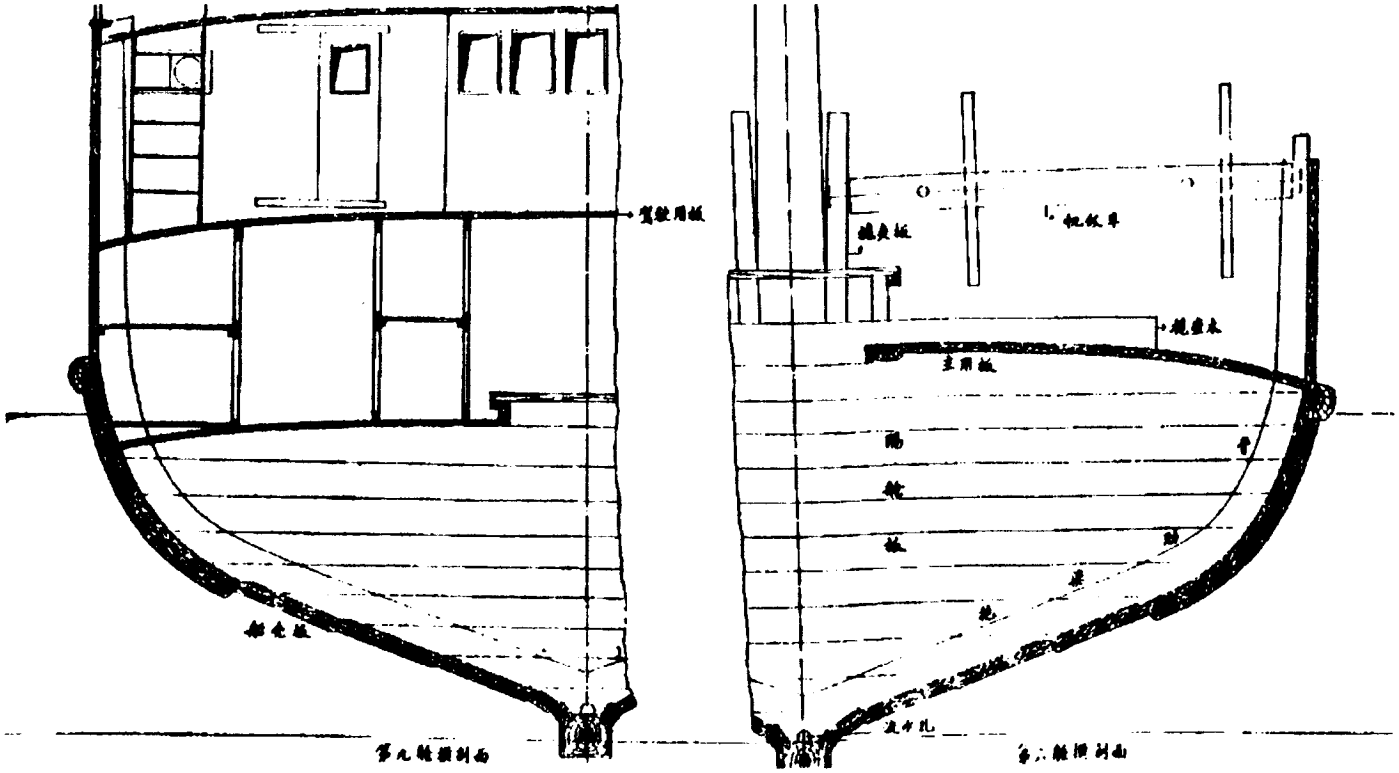

Figure 14: Cross Sections (Reconstruction Group, "Ship After Recovery..." 31.)

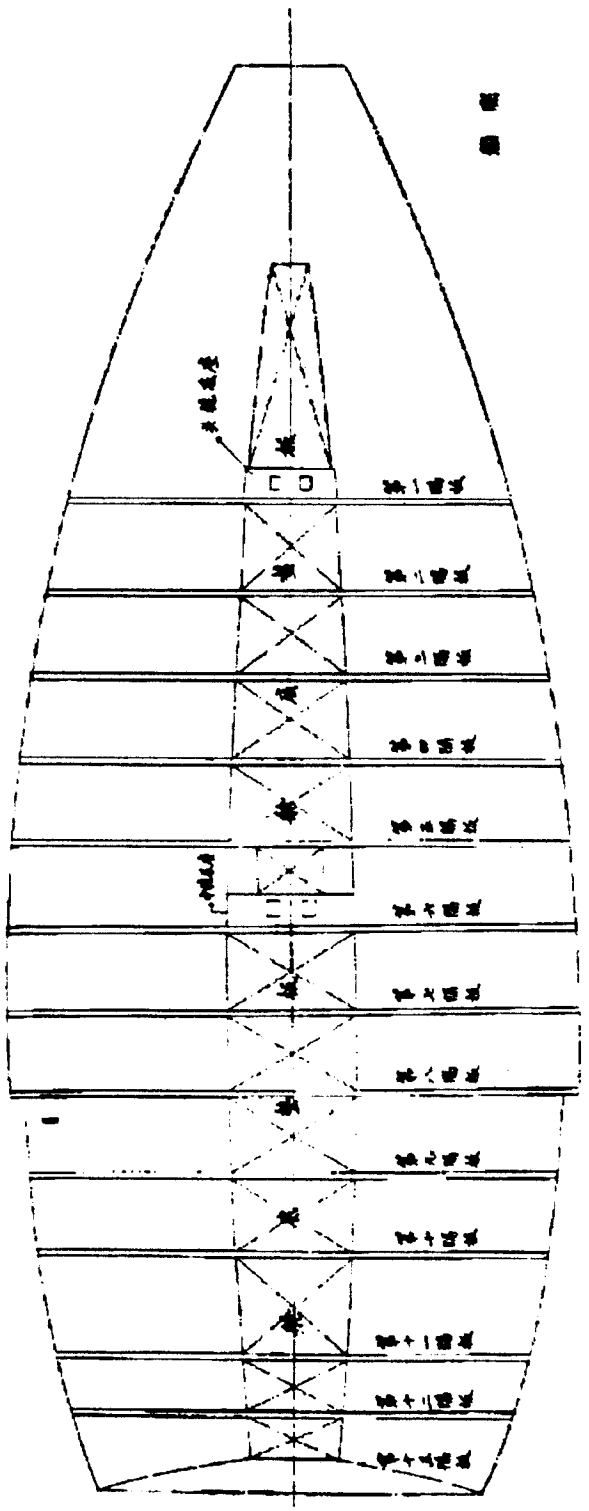

Figure 15: Reconstruction Plan
(Reconstruction Group, "Ship After Recovery..." 32.)

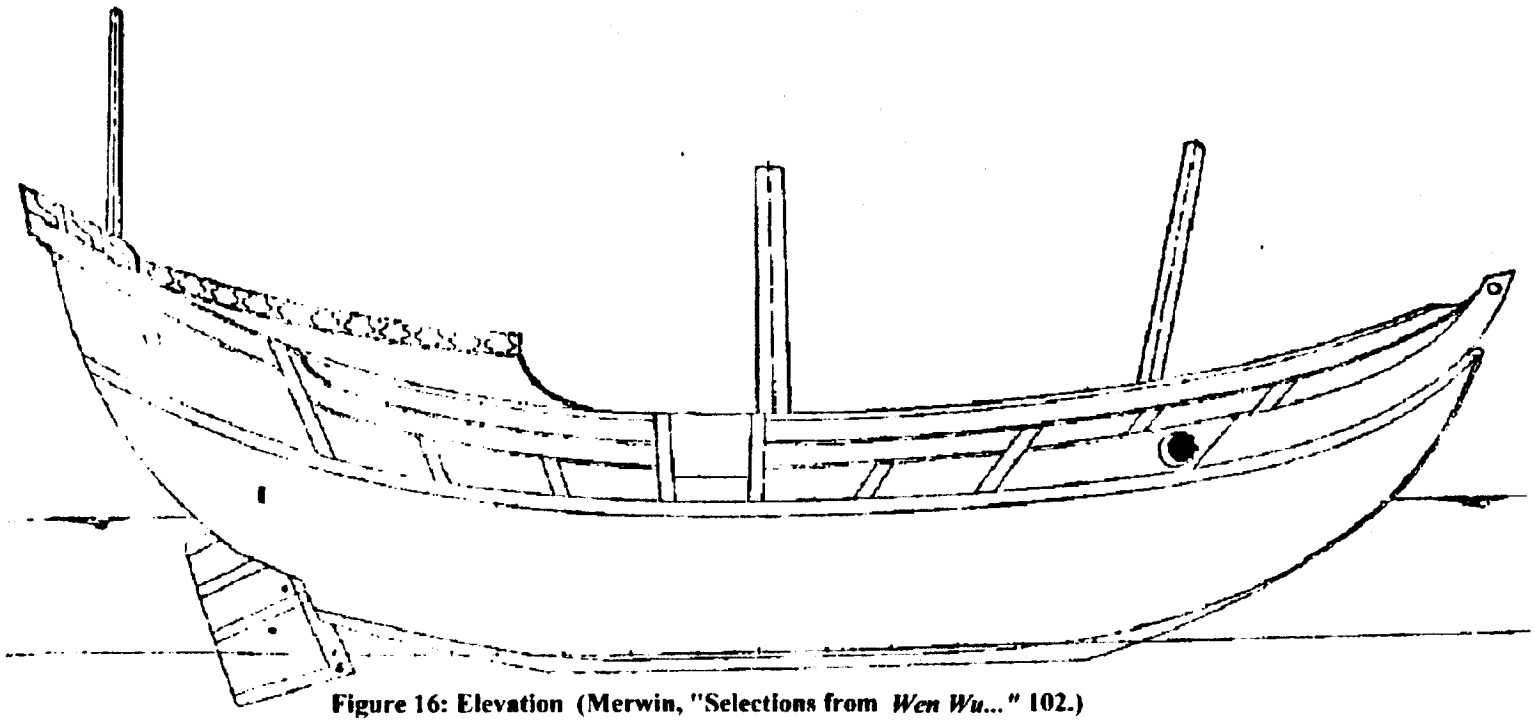

Figure 16: Elevation (Merwin, "Selections from *Wen Wu*..." 102.)

Figure 17: Hull Plank Detail (Archaeological Group, "Song Shipwreck..." 28.)

Figure 18: Scarf Joint Detail (Archaeological Group, "Song Shipwreck.."191

the old dynasty.[29] The Quanzhou ship probably represents a type of vessel similar to some of those involved in the Khan's attempted invasions of Japan.

A second example from this period was discovered in 1975. In Korea, the discovery of the Chinese trade ship at Sinan, near Todohto island, initiated an important program in study and excavation which lasted six years.[30] Most likely a merchant vessel sailing from Ningbo to Korea, rounding the southwestern tip of the peninsula on a journey of about five days, the usual sea route to Song dynasty Korea, the ship may have met a violent storm and sought shelter near the coast.[31]

The Sinan ship is, in some ways, similar to the Quanzhou wreck. Only seven bulkheads were found in place. These are connected to a V-shaped hull by numerous stiffeners. Iron fasteners pierce the hull planks. The hull itself is sheathed with another layer of wooden planks. The existing keel measured over 24 meters long.[32] The restored length is estimated at 30 meters.[33] Multiple masts are stepped directly to the keel. The coins and mirrors placed in "longevity holes" within the keel scarf had a similar arrangement as those in the Quanzhou ship.[34] A cargo tag included in the artifact collection dates the wreck to 1323 C.E.

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[29]Lo Jung-pang, "Maritime Commerce," 98.

[30]Jeremy Green, "The Shinan Excavation, Korea: an interim report on the hull structure," *International Journal of Nautical Archaeology*, 12 (1983), 293-301. Also please refer to Jeremy Green and Zae Guen Kim, "The Shinan and Wando Sites, Korea: further Information," *International Journal of Nautical Archaeology*, vol.18 no.1(1989), 33-41.

[31]For a description of the traditional Korean searoutes, please refer to Shee Sung, "The Contributions of Chinese Merchants," 4-9.

[32]Green and Kim, "The Shinan and Wando Sites," 37.

[33]Li Guo-qing, "Chinese Medieval Sunken Vessels Salvaged in Underwater Archaeology," in *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference* (Richmond, 1991), 54-57.

[34]Green and Kim, "The Shinan and Wando Sites," 36.

The amount of cargo, its excellent state of preservation, and the successful excavation in the face of extremely difficult environmental conditions highlight the long project. The 60-foot deep site featured strong currents, cold water, and zero visibility. The Sinan ship's abundant cargo may prove helpful to those studying ceramics throughout the Southeast Asia. The date affixed to the sinking of the vessel provided a secure fourteenth century context for similar collections. Besides being an important contribution to a very small data base, the Sinan project was the first underwater archaeological investigation in Korea, an impressive beginning.

Several other Song dynasty wrecks have been located in addition to these two sites, though none have yet been investigated as thoroughly. Problems for archaeologists such as urbanization, lack of available technical resources, lack of trained personnel, inaccessibility of sites, difficult working conditions, the prevalence of looting, and the activities of commercial salvage operations all combine to hamper the investigation of underwater archaeological sites in China and Southeast Asia, as they hamper almost all maritime investigations in the western world.

2. Additional Sites

Several other sites provide additional information and the beginnings of a consensus for a Chinese ship styles of the maritime period, though either the investigation or the reporting of the research (or both) does not prove as thorough as the Quanzhou or Sinan ship projects. These sites represent current Western knowledge of Asian investigations; further information may be accessible in the near future.

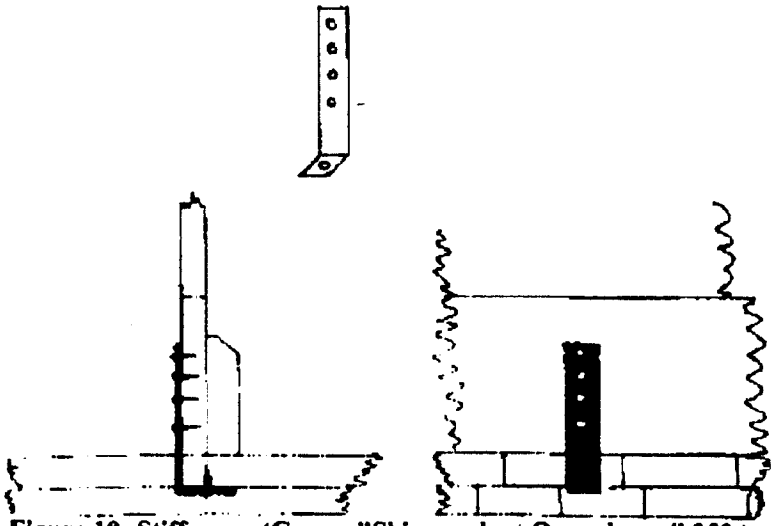

Figure 19: Stiffeners (Green, "Shipwreck at Quanzhou..." 259.)

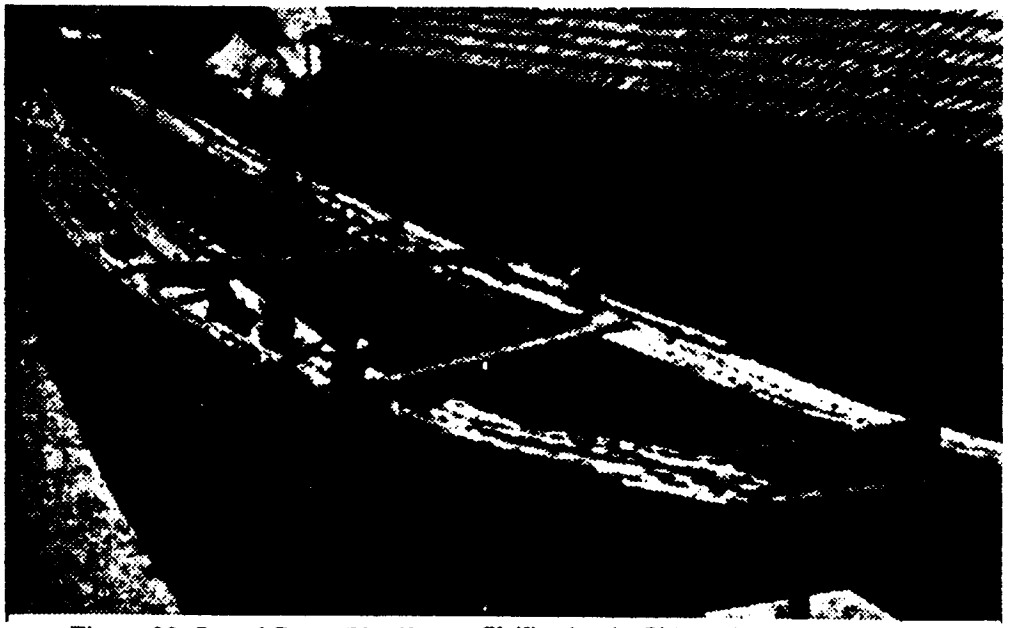

Figure 20: Patrol Boat (Needham, *Civilization in China*, 479.)

Figure 21: Ningbo Ship

(Lin, Du, and Green, "Waterfront Excavations..." 306.)

In 1956 a two-masted ship was discovered in Shandong province in a tributary of the Yellow River. Thought to be a government patrol boat, the transom-ended vessel, 66 feet long and 10 feet in width, contained 13 bulkheads. An inscription on the anchor dates from 1372; another on a bronze cannon found in association with the ship from 1377. The remains of helmets and other accoutrements were also found. The vessel probably operated on the Grand Canal.[35]

In 1974 a rescue/archaeology operation was begun on a possible Song period junk, discovered during the construction of the High Island Water Reservoir Project on Hong Kong. The site emerged from the temporarily drained channel. Ceramics, concentrations of round pebbles and shells in association with structural remains, planks and thick ship timbers (with some evidence of fire damage), wooden pegs, and undefined metal objects were hurriedly mapped in the few days available. Some, but not all, were excavated.[36]

A three-masted Song dynasty vessel was discovered in 1978-79 during rescue excavations at a shipyard complex at Ningbo (ancient Mingzhou) in Northern China. The remains exhibited seven solid bulkheads, hull planks connected with iron fasteners protected by chu-nam putty, a sharp bow and transom stern, and fore and main maststeps braced against the bulkheads. The keel scarf revealed "longevity holes" filled with coins from the Northern Song dynasty. Fir and pine make up the hull structure, with camphor wood and cypress added in the bulkheads. The ship was found in association with the remains of three

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[35]Needham, *Science and Civilization in China*, vol.4, 479. This site is also referred to as the 'Jinan ship' in Green, "Eastern Shipbuilding Traditions," 1.

[36]R.J. Frost and H.C. Hin and B. Ng, "Sha Tsui, High Island." *Journal of the Hong Kong Archaeological Society*, vol.5 (1974), 22-33.

wharves at an historic shipyard encompassing the Tang, Song, and Yuan dynasties, a period over 700 years. Unfortunately, prolonged exposure to the sun shrank the ship's timbers making preservation impossible.[37]

In 1982 near Quanzhou, another Song period vessel was discovered, this time at a beach near Fa shi village. The remains revealed four holds separated by bulkheads, with a hull consisting of a single layer of pine planking. Estimates place the ship's original length at approximately 75 feet.[38]

In Shandong province, in the harbor of Peng lai, a Ming period warship was discovered in 1984. The intact remains, 28 meters long by 5.16 meters wide, possessed 14 compartments separated by bulkheads. The ship featured a pointed bow and square stern, with a V-shaped hull. The original length was estimated at 35 meters.[39]

In Guangdong province, a joint British/Chinese salvage company, while looking for modern wrecks in 1988, came across a Song dynasty vessel. A Japanese firm has successfully negotiated a contract with the Museum of Chinese History for a survey of the site and possible excavation. No other information is available as yet.[40]

In Fujian Province near Dinghai Village, three possible sites were located in 1989, one yielding Song dynasty ceramic wares. No structure, however, has been

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[37]Lin Shimin, Du Genqi (translator) and Jeremy Green, "Waterfront Excavations at Dongmenkou, Ningbo, Zhe Jiang Province, PRC," *International Journal of Nautical Archaeology*, vol.20 no.4 (1991), 307.

[38]Li Guo-qing, "Chinese Medieval Sunken Vessels," 54.

[39]*Ibid.*

[40]Anon, "News," 249.

revealed at any of these sites yet. These finds were in conjunction with the practical training phase of a program in underwater archaeology.[41]

When compared to the historical data, the archaeological sites partially confirm what were previously believed to be fanciful descriptions. Chinese ship remains from before the Ming Ban almost consistently include V-shaped or "knife-edged," with hulls of pine and fir, layered planking (except for vessels of smaller dimensions), solid keels, single rudders, metal fasteners, thick water-tight bulkheads, and a t'ung oil/lime mixture used for caulking. These finds agree with the historical descriptions of Marco Polo, Ibn Battutah, and several Chinese contemporaries. In addition, certain details such as the "longevity holes" are only evident through archaeological investigations, not being mentioned in any available historical documents. These are the construction features which form the beginnings of a distinct style for Chinese ships during the Song to early Ming period. These features also provide a diagnostic basis for evaluation of future finds.

The interpretation of these rare archaeological sites is still in progress. Though they do not form a large sample, these sites, in addition to Southeast Asian and Indian Ocean ship sites, allow a comparison between regional ship types. Historic Chinese ships have evolved within the context of a larger, Asian ship sample. Green, in an article summarizing eastern shipbuilding technology, offers one of the only classification schemes of Asian vessels based on structural features.

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[41]Paul Clark and Zhang Wei, "A Preliminary Survey of Wreck Sites in the Dinghai Area, Fujian Province, China," *International Journal of Nautical Archaeology*, vol.19 no.3(1990), 239.

Table 16: Asian ship classification[42]

1. sewn planks	Indian Ocean Southeast Asia South China
2. planks edge-joined with dowels	Southeast Asia
3. water-tight bulkheads	North and South China Southeast Asia
4. lashed lug	Southeast Asia
5. thwart beams (not penetrating hull)	Indian Ocean
6. thwart beams (penetrating hull)	Japan and Korea
7. transom bow and stern	North China
8. quarter rudders	Southeast Asia
9. axial rudder	China Southeast Asia Indian Ocean
10. multi-planked	China Southeast Asia

Green, however, places the characteristic longevity holes found in the scarf joints of Chinese vessels outside of this list. The uniqueness of this feature may prove important in the future.

[42]Green, "Eastern Shipbuilding Traditions," 4. The classification is borrowed *verbatim* from Green's table.

D. Commercial Cargo/Provision Remains

Armed with an understanding of the type of Chinese maritime trade and the nature of some of the commodities involved throughout Southeast Asia and coastal China, some conclusions concerning the expected artifact remains becomes possible. Though an exhaustive list of all trade commodities over a period of several centuries would be counterproductive, if not impossible, the mainstays of maritime trade can be summed up from the previous historical assessment.[43]

Table 17: major trade commodities, Song to Ming period[44]

to China	from China
aromatic woods (hard woods and incense)	textiles (silk)
medicinals (including spices and exotics, such as rhinoceros horn)	metals (usually in the form of coins)
textiles (cotton cloth)	export ceramics (porcelain)
some manufactured goods (swords, shields, tools, etc.)	iron utensils (such as cookware from Quanzhou)
minerals (mainly sulfur)	

Some of these materials obviously have a much better chance of withstanding immersion in a marine (or terrestrial) environment than others. Textiles such as

[43]This determination is based on several factors...total volume as recorded, relative importance, accessibility for trade merchants, etc.

[44]Information based on Zhao Rugua's report on commercial contacts in Southeast Asia; Wheatley, "Geographical Notes." Whether imported goods were directly exchanged for Chinese exports remains unclear.

silk and cotton, unless they happened to be preserved quickly in a suitable environment (highly unlikely), will have long since disintegrated.[45] Other materials including woods, metals, ceramics, and animal products such as horn, are much more likely to be found in association with maritime sites of the period. Understanding the differences and similarities between what can be expected to be associated with Chinese maritime vessels and what has been observed so far is an important part of forming an interpretation of future related sites.

The concentrations of ceramic materials at Chinese sites in Southeast Asia has previously been noted in the section on maritime geography, but what about the artifacts associated with the shipwrecks themselves? Though not discovered in Southeast Asia, the two best known wreck site studies are the only ones to furnish detailed descriptions of the artifacts found in association with the ship structure. These are listed in order of declining volume, though only representative of recovered (not original) cargo.

[45]This leads to the ironic observation that no actual silk remains along the aptly named Maritime Silk Route to the west, due to the nature of marine preservation.

Table 18: Recovered Wreck Site Artifacts

Quanzhou Ship[46]	Sinan Ship[47]
aromatic woods 2.3 tons (laka wood, sandal wood, garu wood)	export ceramics (over 6,500 high quality pieces)
drugs (spices such as pepper, betel nuts, frankincense, ambergris, cinnabar, mercury)	metals (over 200,000 coins--28+ tons-- along with silver and iron ingots)
animal products (2000 cowry shells, tortoise shells, animal bone from pigs, dogs, rats, sheep, fish, and birds)	manufactured goods (bronze and iron cookware and tools, bronze altar wares)
metals (504 copper coins)	aromatic woods (unstated quantity)
export ceramics (quantity of porcelain, 56 pieces fully restored)	medicinals (also peppercorn and other spices)
manufactured items (brass and iron cookware and tools)	lacquer work
wood tallies (cargo tags)	inkstones and grindstones
bamboo and rattan ware (hats, rope, etc.)	variety of different seeds
variety of different seeds	

[46]Information on artifacts comes from Song Shipwreck group, "The Song Dynasty Shipwreck Excavated at Quanzhou Harbor."

[47]Information concerning Sinan artifacts available from several sources: J. Ayers, "The Discovery of a Yuan ship at Sinan, southwest Korea (first report)," *Oriental Art*, N.S. XXIV: 1 (1978), 79-85; Green, "The Shinan Excavation, Korea,"; D.H. Keith, "A Fourteenth Century Cargo Makes Port at Last," *National Geographic*, vol.156 no.2(1979), 230-43 and "A Fourteenth Century Shipwreck at Sinan-gun," *Archaeology*, vol.33 no.2(1980) 33-43; and Green, "Eastern Shipbuilding Traditions."

Both collections coincide closely with the historical information of table 2; both show a notable lack of any textile remains. Historic and archaeological evidence proves to be in close agreement concerning artifacts carried on board Chinese ships, though two sites do not comprise a valid sample. At least, the comparison does not reveal any contraindications to formulating a list of anticipated remains from historical sources. The quantity of goods found at the Sinan site make this one of the most valuable and informative shipwrecks yet found. The ceramics alone make up the largest concentration of porcelain yet discovered outside of China.[48]

E. Military Ordnance Remains

For Western archaeologists, maritime sites often reveal themselves through the conspicuous presence of ferro/magnetic objects, such as the cannon associated with seagoing naval vessels. Except for the cannon found with the government patrol boat in Shandong province in 1956, and various terrestrial finds at the coastal garrisons of the maritime provinces, no weapons have been found yet in association with any Song through early Ming maritime site. Historical documents make it plain that a large variety of weapons were available to the Chinese imperial navy, at least by the time of the early Ming dynasty voyages. Crossbows, trebuchets, cast fragmentation bombs, cannon and metal shot all accompanied Song, Yuan, and early Ming naval vessels across the waters of the China Seas and Southeast Asia.

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[48]Keith, "Shipwreck at Sinan-gun," 43.

This lack of archaeological evidence may be explained by several factors. The technology for producing large cannon and shot, though begun early in China, still proved relatively primitive until late Yuan and early Ming times.[49] Chinese military experience seemed to emphasize incendiary, rather than kinetic impact types of weapons; rockets and fire arrows have far less conspicuous iron. Furthermore, the policy of the Chinese government (with the exception of the Yuan dynasty) featured greater familiarity with the economic and diplomatic forms of control inherent in the tribute/trade system. Finally, as with commercial trade and ship construction topics, the sample of known archaeological sites still proves exceedingly small. The discovery of naval ordnance may await future research in Eastern nautical archaeology.

[49]For dates concerning the development of cannon in China, please refer to chapter four.

Chapter Seven
Synthesis of Archaeology and History: Thesis Contributions

The historical and the archaeological aspects of the Chinese maritime expansion in Southeast Asia, when examined singularly, suffer from familiar problems typically associated with academic research. Chinese history concerning maritime aspects only appears in select, scattered documents. Often, the official version of events, most notably the Song, Yuan, and Ming imperial dynastic histories, represents an approved and abnormally altered picture of the past, not an immediate primary source. Access to material and questions arising with translations plague research efforts. Archaeological investigations in nautical history, a field relatively new in the West, proves to be even more recent in the East. This is the primary reason for the exceedingly small sample of nautical sites relating to the many centuries of Chinese maritime activity. There is the problem again, of access and translation of archaeological reports. This thesis hypothesized that a combination of the two fields, therefore, would benefit both. Now the question must be asked: has this approach produced any new perspective helpful to further nautical research?

Chapters three and four provide a summation of nautical history for the period of Chinese maritime expansion, rather than any new perspective. It is only with chapter five, the Maritime Geography of Southeast Asia, that this information is, for the first time, placed in relation to a wider field of archaeology throughout the region. A picture of the physical legacy of Chinese maritime expansion in Southeast Asia begins to take shape. The combination of historical and archaeological data reveals several locations which have significance for both

fields. The following sites, an abbreviated selection from information in chapter five, exemplify this intersection.

Table 19: Selected Sites

Philippines	
6. Ma-li-lao hsu Bolinao, or Santiago Island, west coast of Luzon	Bolinao site at entrance to Lingayen gulf revealed scattered sherds from reef shipwreck. Bolinao 2 site (nearby) is stone anchor stock, type known in China, Korea, and Japan--common during Song period. Numerous Song period coins have been recovered from Bolinao.
7. Mo-lao-yang chiang (Anchorage of Balayan) west coast Luzon	Extensive Song, Yuan, and Ming dynasty ceramics discovered near Balayan. Catalagan peninsula features one of the largest concentrations of Chinese artifacts and trade ceramics in the country, most excavated from grave sites.

Borneo	
4. Poni (also Wen-lai, or Ch'ang ning chen) later known as Brunei Town; Kota Batu, Brunei	Extensive trade site with China, from the 7th c on. Ming ceramics recovered. Chinese tomb of Quanzhou port official discovered 1972, dating to 1264. Earliest *in situ* Chinese inscription in Southeast Asia.
5. Shan-tu-wang Santubong; Sarawak river delta, Sarawak	Important seaport, 7th to 13th c. Industrial iron-smelting site 10th-14th c, intensive trade with China. Song and Yuan wares retrieved. No Ming wares found.

Thailand	
3. Hsin men t'ai (New Strait Tower) Songkhram, Mae klong river estuary anchorage; Thailand	Possible landing site for trade missions to Ratchaburi (Rat Buri). At Ratchaburi Large numbers of sherd from 10th-15th c China discovered. Possible transshipment point for re-export inland.

6. Chung pu ch'ien Hlaem Kolam spit, near Nakhon Sri Thammarat; east coast, Thai Peninsula	Large quantity of 10th-14th c Chinese ceramics retrieved, most concentrated site in Thailand. Terminus and entrepot for distribution of Chinese goods. Shipwrecks surveyed in river tributaries nearby

Peninsular Malaysia	
3. Ch'u-ma shan (or Ti-p'an shan) Tioman Island; Johore coast, Malaysia	Chinese ceramics, 11th-14th c washing ashore onto two beaches. Tioman a navigational landmark and possible supply stop.
4. Man-la-chia Malacca; Malaysia	International entrepot following support of Zheng He's missions. Repair facilities and cantonment for Chinese vessels. Ming blue-and-white ceramics, coins etc. Kuan ch'ang, "official station" located here. Chief center of diffusion of Islam in 15th c.

Sumatra	
1. Ta yu chiang (Great Fish Anchorage) Krueng Langsa estuary, east coast Sumatra	Northern access to Kingdom of Aru, near archaeological sites at Kota Cina.
5. Tan shui chiang (Fresh Water estuary) Sungai Deli estuary; east coast, Sumatra	Landing, capital of Aru country, neighbor to Semudera. Access to fresh water for mariners. (Today known as Kota Cina?)
9. Chiu chiang (formerly San-fo-ch'i, then Ku-kang, Old Haven) Palembang capital; Sumatra	Large Chinese community involved in international trade; contacts from 9th to 15th c. Important stop for tribute missions, as well as Mongol expedition of 1309. Several archaeological sites investigated: Air Bersih probably main Chinese colony. Many inhabitants living in houses above the water.

Java	
1. Tu-pan Tuban; Java	Principle port serving Majapahit empire. 14th and 15th c ceramics retrieved from offshore localized area. Site of Mongol punitive raid, 1292. Possible wreck site (or lightening anchorage) located offshore.
4. Hsin ts'un (New Village) Gresik; north coast (Rembang district), Java	Spice and wood port founded by Chinese between 1350-1400. Wealthy community of Cantonese, about 1000 families. Beach surface collections of Yuan dynasty and later period ceramics.

Burma	
2. Ta-na-ssu-li Tenasserim village; Mergui district, lower Burma	Entrepot port, coastal and offshore finds of Yuan and early Ming ceramics.

All these sites represent areas where physical evidence confirms historical documentation. Admittedly, due to the sketchy nature of historical documentation and the small size of the archaeological sample, this location list should not be mistaken for any part of an initial survey plan. The importance of this maritime synthesis lies in its usefulness to post-survey research.

The combination of nautical and terrestrial information can serve to enhance the interpretation of both fields. For instance, whereas terrestrial sites may prove difficult to date accurately due to the relatively slow pace of the site formation, shipwrecks of an immediate and violent nature portray many aspects of a time capsule, often capable of being dated to the precise year of the disaster. In other words, the site formation processes, different in most cases between wet and dry sites, lead to the preservation of different artifact collections. The indications of shipwrecks associated with the above sites, namely at Bolinao, Nakhon Sri Thammarat, Tioman, Tuban, Gresik, and Tenasserim, may possibly contain such

evidence that would prove useful to the interpretation of the terrestrial findings.[1] In like manner, while evidence from land archaeology often cannot be related directly to offshore finds, undated nautical sites found in close geographical association to these selected locations at least gain the possibility of relationship to maritime activities ashore, aiding in the formation of hypotheses in interpretation.

These are the products of the maritime synthesis concerning Chinese expansion in Southeast Asia: 1) the geographical picture of physical remains associated with the particular historical period, 2) the potential for increased understanding in the interpretation of sites, both wet and dry, 3) the formulation of a Chinese artifact typology associated with maritime sites, and 4) the formulation of a distinct Chinese ship typology for the interpretation of future sites. These products are created by the combination of two related fields of research, history and archaeology. The type of artifacts which might be expected to be associated with sites from this period (chapter six), as well as the possibility of finding more sites near these specified locations, can only be suggested from this study, not confirmed. A vast amount of work in nautical research remains to be done within this topic. Plans for the future can only benefit from an understanding of what has already been discovered, and where.

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[1]Of course, as this technique has not yet been used in Southeast Asia concerning shipwrecks of the Song--early Ming period, this exists in potential only.

Chapter Eight
Nautical Archaeology in China and Southeast Asia

Introduction

Several institutions in Asia currently investigate questions concerning not only this particular period of maritime expansion, but other nautical topics as well. For Westerners, the understanding of Asian maritime history must remain a study at least one step removed from the familiarity granted to our own history. The importance of recognizing Eastern institutions, and acknowledging differences in priorities and interpretations, therefore, cannot be too strongly emphasized.

A. China

1. Introduction

The study of history and the aims of archaeology are, perhaps, nowhere more divergent from the Western point of view than in the People's Republic of China. Though this thesis does not pretend to offer an explanation of Marxist doctrine, historical materialism and the events leading up to and following the formation of the modern Chinese state make up the most influential elements affecting nautical research today. A brief understanding of the modern Chinese classification of history helps to place the range of maritime expansion in context.

2. Background

After the communist revolution, the interpretation of archaeological finds took on new meaning. In 1950 Shang period tombs (sixteenth to eleventh century

B.C.E.), many containing the bodies of people apparently buried alive, were understood to be evidence of an ancient slave culture.[1] Further reinterpretations of the subsequent Chou period defined the nature of Chinese civilization as a feudal society, a mode that lasted into the nineteenth century. Later this classification revealed a three part division: the primitive society of prehistoric times, the slave society of the Shang and early Chou, and the feudal society of the late Chou and afterwards.[2] These basic *a priori* interpretations reflect the Marxist materialist view of history as class struggle. Historical and archaeological research in China focus on revealing evidence of this interpretation; this may be part of the meaning of Mao Zedong's doctrine "letting the past serve the present."[3]

> ...The same issue can be looked at in many different ways. If we choose to look at it in some particular way but not in others, it is because we attempt to arrange the different dimensions of the same issue in a certain hierarchical framework; and the criteria according to which we do this may depend on what we conceive to be the particular needs of our history and our society. If the Chinese archaeologists insist on classifying Chinese history into primitive society, slave society, feudal society, and so forth (a system that the American archaeologists do not employ for their own purposes), it is because it serves to bring into focus what they consider to be the primary contradiction in the historical process--namely, class struggles. We must accept that as a valid reason...There is the issue of value here: What is the appropriate scheme for China in her current historical context? It is not my purpose here to render a judgment; but in light of the Chinese context, one is compelled to wonder if it is possible in any

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[1]Albert Feuerwerker, "China's History in Marxian Dress," *American Historical Review*, vol.66 no.2(1961), 337-338.

[2]Cheng Te-K'un, "Archaeology in Communist China," *The China Quarterly*, vol.23(1965), 76.

[3]Feuerwerker, "China's History," 344.

> society to engage in archaeological interpretation at whatever level in ways that are truly value-free.[4]

The field of archaeology, in particular, may serve to emphasize the Chinese focus on materialist history. In the tradition of the French Annales school, physical artifacts emphasize the experience of the common people, often by sheer volume, rather than the documentary evidence of historically important individuals. Differences in social classes are revealed, as well as evidence of political oppression from above and the innate creativity of the masses from below.[5]

Following the creation of the People's Republic, Chinese archaeology received its greatest support. The large construction projects of the 1950's furnished investigators with a large number of newly discovered sites. The protection of these sites and the scientific planning and regulation of excavations became the responsibility of the Bureau of Cultural Relics, which also publishes one of the two main archaeological journals in China, the *Wen Wu*. Furthermore, as of 1982, all cultural relics not yet excavated became property of the state.[6] All archaeologists in China are on the government's payroll.[7] Programs nationwide (at eight universities as of 1977) average three years in length. Four radiocarbon laboratories exist to assist in creating a chronology for various artifacts. Reports

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[4]K.C. Chang, "Chinese Archaeology Since 1949," *Journal of Asian Studies*, vol.26 no.4(1977), 645.

[5]*Ibid.*, 641.

[6]Xia Nai, "A General Survey of China's Archaeological Work," *Beijing Review*, vol.26 no.44 (1983), 24.

[7]K.C. Chang, "Chinese Archaeology," 624.

usually reflect group consensus and are published under the name of the research committee or museum or both.[8]

The great resource for archaeological work in China proved to be from the common people and members of the People's Liberation Army. In a field once reserved for academic authorities, many became involved in large excavations. Experts who had received university instruction worked in close association with the "worker-peasant-soldier" class, usually trained on the site for each particular project.[9]

> During the Great Proletarian Cultural Revolution, China's archaeological workers took an active part in the revolutionary struggle and at the same time did much work in their field. They did not work in isolation but among the people, following the mass line. Workers, peasants or soldiers report ancient relics as soon as they find them and co-operate fully with the archaeological teams which follow up on these leads. This has made the archaeological work develop smoothly and yield richer results than ever before both in new finds in old sites and in the discovery of previously unknown sites.[10]

In addition to acting as a social and political instrument for the interpreting the past, Chinese archaeology has also functioned as a tool for geopolitical control. For instance, China has been involved in international disputes concerning the ownership of certain islands in the South China Sea. In 1980, the Xisha and Nansha island groups, also claimed by Vietnam, became the focus of the Ministry

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[8]Cheng Te-K'un, "Archaeology in Communist China," 69. It must be noted that some of the description of archaeology in China comes from documents no longer current.

[9]K.C. Chang, "Chinese Archaeology," 624.

[10]Xia Nai's contribution in *New Archaeological Finds in China: discoveries during the cultural revolution* (Peking, 1974), 1. Xia Nai is commonly regarded as the father of modern Chinese archaeological science, having written most of the major texts on the subject.

on Foreign Affairs. Citing many of the same references mentioned in chapters three and four of this thesis (such as the *Shun feng*), China developed historical precedence, backed up by archaeological evidence, to support its ownership of these islands.[11] China and Vietnam also dispute the ownership of the Paracel Islands, where fishermen recently discovered Buddhist statues, temples, and the remains of a late Ming dynasty village beneath 60 feet of water.[12] Other disputes have occurred along China and the interior borderlands of the former Soviet Union.

In the past, archaeologists in China have been involved in efforts of a defensive nature, as a reaction to the former practices of their Western colleagues. With the establishment of the modern state in 1949, the exportation of Chinese artifacts ended. Particularly angered by the "cultural aggression and criminal activities of American scholars, museum directors and collectors," the Chinese have, in the past, compiled lists of artifacts illegally taken, such as the relics associated with Peking Man, the treasure of the Palace and the Central Museum, and the National Library of Peking.[13] Defense against archaeological encroachment at this level may not be as well known in the West.

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[11]Harold C. Hinton (ed), *The People's Republic of China 1979-1984: a documentary survey* (Wilmington, 1986), 136-7.

[12]Alexander Besher, *The Pacific Rim Almanac* (New York, 1991), 292. These islands are approximately 425 miles south of Hong Kong.

[13]Cheng Te-k'un, "Archaeology in Communist China," 75.

3. Maritime Interpretation

What does this distinctive Chinese style of archaeological and historical interpretation mean for the period of maritime expansion? The majority of the Song through early Ming time span falls under the later part of the feudal definition for society. Inventions during the Song dynasty, such as printing, gunpowder, and the mariner's compass, highlight the genius of the masses, while neo-Confucianism (a reinterpretation of philosophy which lasted until the nineteenth century and beyond) served as an ideological weapon used by the rulers to tighten their control over the people.[14] The study of the Song dynasty shipbuilding industry features the Chinese interpretation of history: "as a result of the workers' wisdom and creativity, the Song dynasty techniques saw a great amount of advancement and development...This reflects the truth of the saying that 'the lowly are the most intelligent, the high officials are the stupidest'."[15] Also, the historical interpretation holds that during the early Ming period, the imperial navy fostered warm relations throughout Asia, while Japanese feudal landlords continued to support smugglers and pirates. Later, wealthy Chinese landlords and certain merchants in Fujian and Zhejiang provinces collaborated with the pirates.[16] The effects of the maritime prohibition known as the Ming Ban, therefore, take on additional means beyond a restrictive measure meant to control trade. Imperial intervention was also meant to protect the coastal Chinese against seagoing raiders.

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[14]Jiao Jian. "The Song Dynasty: Northern and Southern Song Culture," *China Reconstructs*, vol.29 no.4(1980), 67.

[15]Wang Ts'eng-yu, "The Shipbuilding Industry," 76.

[16]Jiao Jian. "Ming Dynasty: Foreign Relations." *China Reconstructs*, vol.29 no.9(1980), 66-7.

Historical research has, in the past, usually dealt with topics other than maritime history, such as the establishment of the modern socialist state. This is in agreement with the noted emphasis on the present, rather than on the past. Archaeological reports make direct reference to the present significance of historical sites.

> Today, we avail ourselves of the discovery of this Sung dynasty seagoing vessel to retrace and review the traditional friendship which the people of China and foreign countries have established over a long period of time; this is very significant. We firmly believe that the ocean communication between the people of China and the peoples of various countries of Asia and Africa will achieve a new development on an already existing foundation.
>
> The friendly relations between the people of China and the peoples of various countries of Asia and Africa have a long history; and the friendship between the people of China and the peoples of various countries of Asia and Africa will last forever.[17]

Even Song dynasty industry has significance for present maritime efforts.

> After the establishment of the Chinese People's Republic, China's shipbuilding industry has made enormous strides compared with pre-Liberation days. We must certainly obey Chairman Mao's teachings and perpetuate and expand the glorious traditions of the Chinese people and actively develop China's shipbuilding industry in order to promote the tasks of economic and cultural interchange and friendly relations with peoples of every land.[18]

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[17]Anon (History Department of Amoy University), "Geographical Permutations of Ch'uan-chou Harbor and the Overseas Contacts duriong the Sung-Yuan Period," from *Chinese Sociology and Anthropology*, vol.9 no.3(1977), 70. It should be noted that during the 1970's when the reports on the Song vessel were being formulated, China carried out political and diplomatic measures to become involved in aid to developing African countries. The story of the giraffe (one of the gifts transported by Zheng He's fleets) and Sino-African friendship must be seen in this light.

[18]Wang Ts'eng-yu, "The Shipbuilding Industry," 84. These declarations, in the post-Cultural Revolution period, may have been toned down somewhat.

In contrast to this general trend of presentism, the voyages of Zheng He have received a great amount of attention for their own importance in historical research. In 1985, the official 580th anniversary of his voyages, a six volume series concerning Zheng He's voyages was published. Commemorative stamps, a television serial, an educational film, and a memorial hall and park in Changle county, Fujian province were all included in the ceremonies.[19] Zheng He has achieved the status of a Chinese Columbus, though his voyages took place earlier and involved fleets far larger than his Italian counterpart.

4. Current Status

Maritime history is beginning to receive more attention today in China than it has in the past. Several institutions are conducting research in this area. Dalian Maritime College in northern China, the National Museum of Chinese History in Beijing, Xiamen University's anthropology department in Fujian, and the Quanzhou Museum of Overseas Communications History, also in Fujian province, along with other provincial museums along China's coast currently provide the majority of the resources for maritime history and nautical archaeology. In 1987 the National Museum in Beijing established the Underwater Archaeology Program (UAP), which has, so far, investigated five shipwreck sites along China's coast.[20]

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[19]Anon, "580th Anniversary of Zheng He Voyages," *People's Republic of China Year Book 1986* (Beijing, 1987), 660. also Zhou Shu, "Volumes Describe Early Navigator," *Beijing Review*, vol.28 no.34(1985), 38. The Admiral's status may even be greater in overseas Chinese communities. Semarang (Java) in particular regards Zheng He, known there as Sam Po, as a minor deity. Temples are maintained not only for Sam Po, but for at least one of his officers as well.

[20]Personal communication (e-mail) with Ben An Liu, UAP staff member and guest investigator at Woods Hole Marine Policy Center, 22 December 1994.

In 1989, under the direction of the UAP, the University of Adelaide, and the Western Australian Maritime Museum, eleven Chinese archaeologists undertook a training program in underwater archaeological fieldwork, the first of its kind in China.[21] Beginning with basic diving skills, the students focused on basic non-disturbance survey methods for potential sites. The fieldwork included investigations of the three separate sites in the Dinghai area mentioned in chapter six. The innovative international program brought to light many areas in need of further improvement, particularly the improvement of communication skills to overcome the language barrier. Almost all other shipwrecks discovered in China have been dry site investigations, conducted by traditional land archaeologists.

Maritime migration between southern China and Southeast Asia has become a topic in its own right. In 1990-91, an UNESCO initiative sponsored the Conference on the Maritime Silk Route, a retracing of the traditional maritime trade from west to east.[22] The modern vessel, *Fulk al Salamah*, owned by the Sheik of Oman, hosted a rotating complement of historians and archaeologists as the ship made its way from Venice, Italy to Osaka, Japan. A number of significant articles on related topics, such as "The Politics of Trade and the Establishment of the Quanzhou Trade Superintendency" (Clark), "Zayton Port: Two-way Sustenance for the Marine Silk Route" (Fu), and "A Research into the Ship of the Song Dynasty--Private Ship of Pu" (Zhuang), were added to the two volumes of proceedings. Linguistic, sociological, and technical papers contributed to the

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[21]Karen Atkinson-Millar, "The First Stage of a Maritime Archaeological Training Programme in the People's Republic of China: a Brief Summary of the Aims, Procedures and Results," *International Journal of Nautical Archaeology*, vol. 19 no.3 (1990), 255-258.

[22]Guy, "China and the Maritime Silkroute Conference," *International Journal of Nautical Archaeology*, vol.21 no.1(1992), 70-73.

multidisciplinary approach. Hopefully other international assemblies will continue in this wide field of research.

B. Southeast Asia

1. Introduction

Several nautical programs exist in Southeast Asia, each dealing with a distinctive cultural field within a regional history noted for its international and eclectic nature. In addition, an archaeological training and research organization, known as SPAFA, involves participants from many countries. Originally started in 1972 as SEAMEO (Southeast Asian Minister of Education Organization) in Cambodia, the founding members included Indonesia, Laos, Philippines, Malaysia, Vietnam, and Singapore. Most of the staff were killed by the Khmer Rouge shortly after the organization had begun.[23] SPAFA (SEAMEO Project in Archaeology and Fine Arts), now located in Bangkok, publishes discussions, papers, and full reports on a variety of regional archaeological activities. Many of these have focused on the history of the Kingdom of Srivijaya, featuring archaeological studies in the Palembang area of southeastern Sumatra.[24] The organization's role includes nautical work, both in training and field projects. Unfortunately, however, the underwater archaeology section of SPAFA has been inactive for the past few years.[25]

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[23]Wilhelm G. Solheim II, "Archaeology and Anthropology in Southeast Asia," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 180.

[24]Of particular note, please see SPAFA workshop, *Studies on Srivijaya* (Jakarta, 1981).

[25]Jeremy Green, personal communication with author (e-mail) 11-16-94.

Other Southeast Asian organizations include ASEAN sponsored archaeological field schools, initially organized by the National Museum of the Philippines. The International Association of Historians of Asia (IAHA) holds meetings every three years. The Indo-Pacific Prehistory Association (IPPA), first known as the Far-Eastern Prehistory Association, publishes the *Bulletin of the Indo-Pacific Prehistory*. An offshoot of this journal, *Asian Perspectives*, is now published by the University of Hawai'i Press. Finally, the Pacific Science Congress, held once every five years, usually includes archaeological panels on Southeast Asian topics.[26]

2. Philippines

The National Museum, the only archaeological institution in the country with a professionally educated staff, represents the main support for archaeology in the Philippines. As a member of SPAFA, the Philippines continues to contribute to archaeological research throughout Southeast Asia. Most of the modern terrestrial work features the two major themes of Chinese trade and jar burials, and is strongly oriented towards individual sites, rather than the development of a comprehensive chronology.[27] As of 1987, the shortage of qualified archaeologists and the lack of support from the Philippine government has led to a looting problem virtually out of control.[28] Every major known land site of Asian trade ceramics has been partially or completely destroyed.

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[26]Solheim, "Archaeology and Anthropology," 180-1. As noted earlier, some of the documents describing archaeology in Southeast Asia are no longer current; the field of maritime archaeology continues to change.

[27]Karl L. Hutterer, "Philippine Archaeology: Status and Prospects," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 236, 246.

[28]*Ibid.*, 248.

Underwater research in the Philippines dates to 1967, with the joint venture excavation (National Museum and Times-Mirror-Taliba) of the remains of a Spanish galleon. Some of the other joint projects between the National Museum and a host of commercial organizations, such as Marine Archaeology Unlimited Incorporated, or MAUI (1982), Mr. Brian Homan (1983), Scientific Survey and Location Limited (1985), and World Wide First Incorporated (1985, 1986), feature surveys and excavations of supposed Asian trade vessels, Spanish galleons, and East India Company merchantmen.[29] In 1990 the National Museum began research on an eighteenth century European vessel discovered in southern Luzon. Work has also continued on thirteenth century lashed-lug planked boats found in northeastern Mindinao, examples of indigenous Philippine coastal vessels. The cooperative nature of most of these projects represents a partial solution to the National Museum's lack of underwater archaeology equipment.

Since 1986, the National Museum's draft of "Policy Guide-lines for Underwater Archaeology Applications to Explore and to Excavate in Philippine Waters" has attempted to regulate the exploitation of marine cultural resources. In 1988 bill number S-695, known as the *Protection of Underwater Cultural Heritage Act*, was placed before the Philippine Senate. This bill, stating that the "ownership of all objects of underwater cultural heritage found in territorial waters, regardless of origin is vested directly in the state," charged the National Museum with the task of enforcement.[30] Hopefully, the destruction of maritime sites for commercial gain, such as the Spratly Island shipwreck (chapter five) will not be repeated.

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[29]W.P. Ronquillo, "Philippine Underwater Archaeology: Present Research Projects and new Developments," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.14 no.1(1990), 21.

[30]*Ibid.*, 24.

3. Burma

The Archaeology Department, formerly called the Archaeological Survey of Burma, falls under the regulation of the Ministry of Culture. In the past, theoretical archaeology has been taught at the Arts and Science University in Mandalay, some of the senior archaeologists having received training from abroad.[31] As of 1987, most of the Department's budget has gone towards the conservation and restoration of terrestrial sites. The non-publication of reports concerning land (or maritime) archaeology, and the subsequent lack of information available to Western researchers, is one result of the government's strict policy towards foreign contact.

4. Vietnam

The Archaeological Committee, a section of the Committee for Social Sciences of Vietnam, has grown rapidly since its beginnings in 1959.[32] Archaeologists have relatively high status (and budgets) compared to those in other Southeast Asian countries. The main journal, *Kao Ko Hoc*, features contents in English as well as Vietnamese. Archaeological training is carried out at the University of Hanoi, and teams for fieldwork are run by the Institute of Archaeology, also in Hanoi.

The 1991 excavation of a late seventeenth century lorcha near Con Dao represents the first modern investigation of an historic Chinese shipwreck in Vietnamese waters.[33] In order to gain financial resources for the research, Visal

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[31] Solheim, "Archaeology and Anthropology," 176.

[32] *Ibid.*, 178.

[33] Flecker, "Excavation of an Oriental Vessel."

(the state owned Vietnam Salvage Corporation) signed a contract with a Swedish company in 1990 for the recovery of approximately 3000 porcelain artifacts. The commercial operation focused on surface collection at the 120 foot deep site, leaving the ship remains completely intact. In 1991 the project continued with the systematic excavation of the entire site. An unknown number of wreck sites in northern Vietnam have been reported to have been contracted by the government to commercial salvage companies.[34] With the improvement of relations between Western nations (namely, the United States) and Vietnam, greater cooperation in the form of joint maritime investigations may be possible in the near future.

5. Thailand

The National Fine Arts Department in Bangkok, once part of Silkaporn University, is currently in charge of archaeology, including historic and prehistoric research and publication.[35] Several universities, such as Silkaporn, Thammasat, Chiang Mai, and Prince of Songkhla, are also involved in archaeological training and fieldwork. Cooperative ventures with other countries, such as Denmark, the British Commonwealth, and the United States (University of Hawai'i) have led to an atmosphere hospitable to foreign researchers. The primary archaeological journals are the *Muang Boran,* featuring an occasional article in English, and the *Journal of the Siam Society*, even more accessible to English readers.

The Division of Archaeology of the Fine Arts Department also operates an underwater archaeology unit. As an important member of SPAFA, Thailand is in charge of all underwater archaeological training for member countries of Southeast

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[34]Green, "News," 257.

[35]Solheim, Archaeology and Anthropology," 177.

Asia. In 1991 the training program at the Ko Talu wreck site, a nineteenth century trade vessel, involved participants from Thailand, Indonesia, Philippines, Sabah, and Malaysia.[36] SPAFA archaeologists have also been active in earlier training programs on other shipwrecks in the Gulf of Thailand, such as Ko Si Chang 3. The joint archaeological survey between Thailand and the Western Australian Maritime Museum in the mid 1980's has furnished some of the most complete reports on the nature of Southeast Asian vessels yet published.[37] These maritime studies serve to facilitate understanding of the complex chronology of regional ceramic wares from a number of distinct cultures.

6. Indonesia

Established in 1913, the archaeological service in Indonesia, first known as Dinas Purbakala and now as the National Research Center for Archaeology (NRCA), is comprised of several divisions: prehistory, classical archaeology, and Islamic archaeology. The Islamic archaeology division focuses primarily on the coastal areas of the archipelago.[38] A separate institution, the Directorate of Protection and Preservation of Historical and Archaeological Remains, has charge of protecting existing sites. Academic institutions, such as the University of Indonesia at Jakarta, Gadjah Mada University in Yogyakarta, and Udayana University in Denpasar, conduct training and field research programs. As with

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[36]Green, "News," 256.

[37]Please refer to Jeremy Green, Rosemary Harper and Vidya Intakosi, *The Maritime Archaeology of Shipwrecks and Ceramics in Southeast Asia; [and] the Ko Si Chang 3 Shipwreck Excavation* (Victoria, 1987).

[38]R.P. Soejono, "Archaeological Research in Indonesia," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 213-215.

other Southeast Asian countries, joint ventures with foreign partners, chiefly Australia, the Netherlands, and the United States, have been carried out in the past, though the trend tends toward becoming independent of foreign agencies and resources.

Indonesia's large territory has been divided into a number of research areas, each with a branch office of the National Research Center. Maritime sites, subsequently, fall under the supervision of the branch office closest to their location. As a member of SPAFA, archaeologists from throughout Southeast Asia have received support for work in Indonesia, particularly in the Palembang region of Sumatra. Offshore, commercial salvage operators operate with government-issued permits. Song dynasty, Yuan dynasty, and eighteenth century European shipwrecks have been reported by these operators, though the reports have yet to be accompanied by any archaeological information.[39]

7. Eastern Malaysia and Brunei

Archaeology in the Malaysian area of Borneo (including the states of Sarawak and Sabah), since the period when Tom Harrisson worked as the curator of the Sarawak Museum (1946-67), has suffered from an internal lack of trained personnel and the exclusion of foreign researchers.[40] This resulted in a wealth of studies from sites outside the area, such as Kalimantan in Indonesia. Recently, scholars have been returning to Sarawak, Sabah, and Brunei, each of which supports a museum with the aim of reintroducing modern archaeological

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[39]Green, "News," 257.

[40]Vinson H. Sutlive, Lucas Chin and David McCredie, "Archaeology and Anthropology in East Malaysia and Brunei," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 182.

operations. In Sarawak, limited resources restrict fieldwork to purely rescue archaeology. As of 1987, the Sabah Museum had no qualified archaeologist on the staff. Only in Brunei, where the staff has received training at the Australian National University, has systematic archaeological research begun.[41] The museum also features the *Brunei Museum Journal*, the main publication for archaeological information in the area.

As of 1987, there were no provisions against foreign archaeologists working in areas such as Sabah, provided such work was carried out in cooperation with the Museum, and all formalities of the local Antiquities and Treasure Trove Enactment were observed. This area, as noted in chapter five, may retain the physical remains of a permanent Chinese settlement from the Yuan dynasty. In 1989 Sabah Museum divers participated in SPAFA training in underwater archaeological techniques.[42] Both Sabah and Sarawak have enacted laws protecting cultural antiquities found "to be part of the soil or of the bed of a river or lake or of the sea."[43] Hopefully, further evidence of Chinese maritime activities will come to light as resources for archaeology, both terrestrial and underwater, improve.

8. Peninsular Malaysia

Archaeological activities in Peninsular Malaysia come under the jurisdiction of the Museum Department's National Archaeological Survey and

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[41] *Ibid.*, 198.

[42] Adi Haji Taha, "Current Status of Underwater Archaeology in Malaysia." *Bulletin of the Australian Instutute for Maritime Archaeology*, vol.13 no.2(1989), 3.

[43] *Ibid.*, 4.

Research Unit (NASRU), itself a section of the Ministry of Culture.[44] NASRU is further divided into three areas: Prehistoric Archaeology, Bujang Valley Archaeological Project, and Underwater Archaeology. Since 1980 all research has been carried out by Malaysian investigators, as opposed to foreign scholars, though joint ventures proposed at the inter-governmental level may still be welcomed.[45] Training within Malaysia is carried out at three universities. The Museum Department has charge of regulating research and fieldwork, as well as the protection of historical sites. Though not a contributing member, many Malaysian archaeologists and technicians have benefited from SPAFA training at centers throughout Southeast Asia.

The underwater archaeology section, first established in 1982, currently suffers from a lack of trained personnel, resources, and a defined long-term program.[46] Archaeologists, however, recognize the strategic position of the Malay Peninsula to the maritime traffic of historic Southeast Asia and the potential for cultural resources underwater.

> In the later history of Southeast Asia, the geographical position of Peninsular Malaysia, being situated half-way between the major trade centers of China in the east and India and the Arab world in the west, also seems to point out the significant role it might have contributed in the early maritime trade. At the time when long distance navigation depended to a great extent on monsoon winds, the Malay Peninsula served as an ideal port to break the journey whilst waiting for

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[44] Adi Haji Taha, "Archaeology in Peninsular Malaysia: Past, Present, and Future," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 205-209.

[45] *Ibid.*, 208, 210.

[46] *Ibid.*, 209.

> the appropriate monsoon, and this claim could be proved archaeologically.
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> In view of this strategic position, data on the archaeology...of Peninsular Malaysia is indispensable towards resolving the culture history of Southeast Asia on the whole and for any understanding of the cultural flows and movements into, within and from this part of the world.[47]

Spanish, Dutch, Portuguese, English, Southeast Asian, and Chinese ships represent a wealth of material waiting to be discovered in Malaysian waters.[48] In 1984 Malaysian authorities, under the guidance of the Museum Department and with the cooperation of Royal Malaysian Navy divers, as well as the governments of the Netherlands and Australia, took over the survey and excavation of the *Risdam*, a fluit-type Dutch East Indiaman which was in the process of being looted by a Singapore-based salvage company. The project generated the first large-scale publicity forum for underwater archaeology. Today the site is reserved for training purposes. The Department of History at the University of Malaya then organized a seminar on "Ships and Sunken Treasures," and attention turned towards the Portuguese *Flor de la Mar*, sunk in 1512 off the coast of Sumatra.

The Malaysian government recognizes two types of shipwrecks in territorial waters: 1) those with no Malaysian cultural significance, or transients, and 2) local Malay or Chinese ships directly related to Malaysian culture and history.[49] Revenue from permits issued for the controlled (accompanied by an archaeologist) salvage of the first type is used to finance the scientific investigation of the second.

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[47]*Ibid.*, 205-6.

[48]Taha, "Current Status," 3.

[49]*Ibid.*, 4.

A host of institutions, such as the Museum Department, the Marine Department, the Marine Police, the Royal Malaysian Navy, and the individual state governments, are involved in monitoring aspects of submerged cultural resources. There is no legislation, however, which specifically pertains to shipwrecks, except the land-based Antiquities Act of 1976. From the perspective of nautical archaeology, peninsular Malaysia and the adjacent waters may contain one of the greatest material collections and potential for the growth of underwater research.

Chapter Nine
Postword

In the past there has been a general underestimation by Westerners of the expansive maritime aspects of China in Southeast Asia, a situation mirrored by the lack of understanding by Chinese leaders when faced with the advanced Western naval technology of the early nineteenth-century. This is a reflection of the difficulties involved in maintaining a truly global perspective. The lack of transmission in either direction is neither the fault of one hemisphere nor the other. Rather, it is a deficit borne of extreme geographical distances and profound cultural differences, one which calls for greater effort from both Eastern and Western scholars in the comprehension of a global maritime history.

Historic Chinese maritime activity, nonetheless, has played an important role from the western Pacific to across the Indian Ocean for more than a thousand years. For instance, Zheng He's Port of Malacca (as does now the island of Singapore) stood at the commercial and geographic confluence of six great bodies of water: the South China Sea, the Gulf of Thailand, the Java Sea, the Straits of Malacca, and through these the Indian and Pacific Oceans. Many sites in Indonesia and around the Straits of Malacca, some described in this study, witnessed centuries of intensive sea-going traffic. Chinese nautical activity in Southeast Asia represents the most extreme development of maritime history in the region prior to European contact. This type of broad overview, covering a range of several hundred years, has not exhausted the topic, but serves to highlight maritime history questions previously unfamiliar to Western researchers.

On a personal note, this study has also served to open many other doors in topics related to the maritime history of China and of the Pacific Ocean. China's

attitudes towards maritime contact changed little between the Ming dynasty and the Opium Wars of the nineteenth century. The conditions which brought Western warships into armed conflict with Chinese forces, however, were purely based on the new economies of early maritime trade across the Pacific Ocean. For instance, the sandalwood and fur traders, who in short order depleted resources in the South Pacific, Hawai'i, and the Pacific Northwest, raced to barter with Cantonese merchants in a trade still regarded at that time by the Chinese emperor as appropriate tribute from barbarian kingdoms. The traditional fire ships and cannon of the underdeveloped Chinese navy proved no match for modern British vessels. Advanced naval technology soon ended any chance at peaceful resolution.

Studying the skills and resources of the maritime Chinese populations in Fujian, Guangdong, and Zhejiang, also raises many more questions than answers. The emigration of the coastal populations, particularly with the phase beginning in the early Ming dynasty, sent southern Chinese further abroad than at any time in the past. These same coastal mariners later boarded European vessels and were transported as cheap labor to locations such as Peru, California, Hawai'i, Australia, and South Africa, in what might be thought of as a type of Pacific slave trade.[1] Those mariners who remained in China practicing their traditional occupations have lately been associated with the 'Tanka' or Sea Peoples. Certain Chinese mariners have lived exclusively on the water for centuries, as they still do today in ports like Hong Kong. Obviously, the Chinese maritime story does not end with the Ming Ban of the fifteenth century.

This thesis exists, not only as a synthesis of Chinese maritime research, but as a document which makes available a small portion of the Chinese maritime

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[1]My own great grandfather emigrated to Hawai'i from Guangzhou in this manner in the early 1850's.

experience to Western scholars. The large disparity between the richness of the maritime experience in China and Southeast Asia and the current state of research provides an opportunity to bridge cultural and other barriers to the benefit of both East and West. Obstacles such as different languages, cultural unfamiliarity, and the great distances involved provide researchers with challenges, rather than insurmountable barriers. The effort is rewarded, however, with the chance to study one of the most interesting maritime cultures in history, the seafarers of historic China.

Appendix A: Stele Translation

This document, originally transcribed and published in modern version by Chin Yunming in the Journal of the Fujian Christian University in Foochow, vol.26 December 15th 1937, represents the second such stele discovered regarding Zheng He's maritime voyages.[1] The tablet was found by a government official in the yamen of Changle in Fujian where it had been transported at some earlier date from the nearby Temple of the Celestial Spouse. It was erected by Zheng He and his officers in the year 1432 C.E.[2] As one of the more reliable "primary" sources of the period, the stele illuminates several aspects of the Ming voyages, such as the chronology of the journeys, the dedication to a state-sanctioned goddess, and the general attitude held towards the southern and western foreigners.

Record of the miraculous answer (to prayer) of the goddess, the Celestial Spouse.

The Imperial Ming Dynasty in unifying the seas and continents, surpassing the three dynasties even goes beyond the Han and the T'ang dynasties. The countries beyond the horizon and from the ends of the earth have all become subjects and to the most western of the western or the most northern of the northern countries, however far they may be, the distances and the routes may be calculated. Thus the barbarians from beyond the seas, though their countries are

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[1]The first, discovered at Liujia jiang, also at the Temple of the Celestial Spouse (Tien Fei), was erected by Zheng He and his companions in 1431. The text closely resembles the second example.

[2]Duyvendak presents a copy of this early transcription in "The True Dates of the Chinese Maritime Expeditions," 349-355.

truly distant, "with double translation" have come to audience bearing precious objects and presents.

The Emperor, approving of their loyalty and sincerity, has ordered us (Cheng) Ho and others at the head of several tens of thousands of officers and flag-troops to ascend more than a hundred large ships to go and confer presents on them in order to make manifest the transforming power of the (imperial) virtue and to treat dustant people with kindness. From the 3rd year of Yung-lo (1405) till now we have seven times received the commission of ambassadors to the countries of the western ocean. The barbarian countries which we have visited are: by way of Chan-ch'eng (Champa), Chao-wa (Java), San-fo-ch'i (Palembang) and Hsien-lo (Siam) crossing straight over to Hsi-lan-shan (Ceylon) in South India, Ku-li (Calicut), and K'o-chih (Cochin), we have gone to the western regions Hu-li-mo-ssu (Hormuz), A-tan (Aden), Mu-ku-tu-shu (Mogadisho), all together more than thirty countries large and small. We have traversed more than one hundred thousand *li* of waterspaces and have beheld in the ocean huge waves like mountains rising skyhigh, and we have set eyes on barbarian regions far away hidden in a blue transparancy of light vapours, while our sails loftily unfurled like clouds day and night continued their course (rapid like that) of a star, traversing those savage waves as if we were treading a public thoroughfare. Truly this was due to the majesty and the good fortune of the Court and moreover we owe it to the protecting virtue of the divine Celestial Spouse.

The power of the goddess having indeed been manifested in previous times has been abundantly revealed in the present generation. In the midst of the rushing waters it happened that, when there was a hurricane, suddenly there was a divine lantern shining in the mast, and as soon as this miraculous light appeared the danger was appeased, so that even in the danger of capsizing one felt reassured

that there was no cause for fear. When we arrived in the distant countries we captured alive those of the native kings who were not respectful and exterminated those barbarian robbers who were engaged in piracy, so that consequently the searoute was cleansed and pacified and the natives put their trust in it. All this is due to the favours of the goddess.

It is not easy to enumerate completely all the cases where the goddess has answered (prayers). Previously in a memorial to the Court we have requested that her virtue be registered in the Court of Sacrificial worship and a temple be built at Nanking on the bank of the dragon river where regular sacrifices should be transmitted for ever. We have respectfully received an Imperial commemorative composition exalting the miraculous favours, which is the highest recompense and praise indeed. However the miraculous power of the goddess resides wherever one goes. As for the temporary palace on the southern mountain at Ch'ang-lo, I have, at the head of the fleet, frequently resided there awaiting the (favourable) wind to set sail for the ocean. Thereupon in the tenth year of Yung-lo (1412) I reported in a memorial that the place where the government troops pray and report their success had already been completely put in order. On the right hand side (i.e. the Westside) there was on the Southern mountain a pagoda of very great antiquity which was in a neglected and dilapidated condition. On each visit repairs were made and after a lapse of several years the priciple halls and meditation chambers now greatly surpass the former standard. This year in the spring having started once more for the barbarian countries I have moored the ships in this port and, having again repaired the halls of the Buddhas and the palaces of the gods with even more splendour, I furthermore resolve to spend funds for the building of a Precious Hall for the Three Pure ones to the left of the palace, to have wholly new and beautiful images of the gods sculpted and decorated, and to provide

completely all the bells, drums and sacrificial utensils. It was declared unanimously that thus it would be possible to serve with the utmost reverence the heart of divine intelligence of heaven and earth, and all vowed that it should be thus, so that all gladly hasten hither to serve. The buildings, grand and beautiful, will be completed before long, the painted beams rise up to the clouds in a vigorous flight. Moreover there are green pinetrees and bamboo of kingfisherblue giving a pleasant shade on either side. The gods having a peaceful dwelling and men rejoicing, it surely is a remakable spot. How would such a place and such people not all receive happiness and prosperity? If men are able to serve their prince with the exertion of all their loyalty then all things will be successfully established, if they are able to serve the gods with the utmost sincerity then all their prayers will be answered.

We, Cheng Ho and others, on the one hand have received the high favour of a gracious commission of our Sacred Lord, and on the other hand carry to the barbarians the benefits of respect and good faith (on their part). Commanding the ultitudes on the fleet and (being responsible for) a quantity of money and valuables in the face of the violence of the winds and the nights our one fear is not to be able to succeed; how should we then dare not to serve our dynasty with exertion of all our loyalty and the gods with the utmost sincerity? How would it be possible not to realize what is the source of the tranquillity of the fleet and the troops and the salvation on the voyage both going and returning? Therefore we have made manifest the virtue of the goddess on stone and have moreover recorded the years and months of the voyages to the barbarian countries and the return in order to leave (the memory) for ever.

I. In the third year of Yung-lo (1405) commanding the fleet we went to Ku-li (Calicut) and other countries. At that time the pirate Ch'en Tsu-yi had gathered

his followers in the country of San-fo-ch'i (Palembang), where he plundered the native merchants. When he also advanced to resist our fleet, supernatural soldiers secretly came to the rescue so that after one beating of the drum he was annihilated. In the fifth year (1407) we returned.

II. In the fifth year of Yung-lo (1407) commanding the fleet we went to Chao-wa (Java), Ku-li (Calicut), K'o-chih (Cochin) and Hsien-lo (Siam). The kings of these countries all sent as tribute precious objects, precious birds and rare animals. In the seventh year (1409) we returned.

III. In the seventh year of Yung-lo (1409) commanding the fleet we went to the countries (visited) before and took our route by the country of Hsi-lan-shan (Ceylon). Its king Ya-lieh-k'u-nai-erh (Alagakkonara) was guilty of a gross lack of respect and plotted against the fleet. Owing to the manifest answer to prayer of the goddess (the plot) was discovered and thereupon that king was captured alive. In the ninth year (1411) on our return he was presented (to the throne) (as a prisoner); subsequently he received the Imperial favour of returning to his own country.

IV. In the eleventh year of Yung-lo (1413) commanding the fleet we went to Hu-lu-mo-ssu (Ormuz) and other countries. In the country of Su-men-ta-la (Samudra) there was a false king Su-kan-la (Sekandar) who was marauding and invading his country. Its king Tsai-nu-li-a-pi-ting (Zaynu-'l-Abidin) had sent an envoy to the Palace Gates in order to lodge a complaint. We went thither with the official troops under our command and exterminated some and arrested (other rebels), and owing to the silent aid of the goddess we captured the false king alive. In the thirteenth year (1415) on our return he was presented (to the Emperor as a prisoner). In that year the king of the country of Man-la-chia (Malacca) came in person with his wife and son to present tribute.

V. In the fifteenth year of Yung-lo (1417) commanding the fleet we visited the western regions. The country of Hu-lu-mo-ssu (Ormuz) presented lions, leopards with gold spots and large western horses. The country of A-tan (Aden) presented *ch'i-lin* of which the native name is *tsu-la-fa* (giraffe), as well as the long-horned animal *ma-ha* (oryx). The country of Mu-ku-tu-shu (Mogadisho) presented *hua-fu-lu* (striped zebras) as well as lions. The country of Pu-la-wa (Brawa) presented camels which run one thousand *li* as well as camelbirds (Ostriches). The countries of Chao-wa (Java) and Ku-li (Calicut) presented the animal *mi-li-kao*. They all vied in representing the marvellous objects preserved in the mountains or hidden in the seas and the beautiful treasures buried in the sand or deposited on the shores. Some sent a maternal uncle of the king, others a paternal uncle or a younger brother of the king in order to present a letter of homage written on gold leaf as well as tribute.

VI. In the nineteenth year of Yung-lo (1421) commanding the fleet we conducted the ambassadors of Hu-lu-mo-ssu (Ormuz) and the other countries who had been in attendance at the capital for a long time back to their countries. The kings of all these countries prepared even more tribute than previously.

VII. In the sixth year of Hsuan-te (1431) once more commanding the fleet we have left for the barbarian countries in order to read to them (an Imperial edict) and to confer presents. We have anchored in this port awaiting a north wind to take the sea, and recalling how previously on several occasions we received the benefit of the protection of the divine intelligence we have thus recorded an inscription in stone.

The sixth year of Hsuan-te, the cyclical year *hsin-hai*, the second winter month (December 5th--January 3rd 1432). on a lucky day, erected by the principal envoys, the Grand Eunuchs Cheng Ho and Wang Ching-hung, the assistant-

envoys, the Grand Eunuchs Li Hsing, Chou Liang, Chou Man, Hung Pao, Yang Chen, Chang Ta and Wu Chung, and the Commanders Chu Chen and Wang Heng.

The superior resident monk Yang Yi-ch'u (whose religious name is) Cheng-Yi (Correct and One), knocking down his head, begs to erect this stone.

Appendix B:
Time Line: Star Raft Expeditions

The end of China's maritime expansion came about very swiftly compared to the long period of evolution. Military and political events of the early Ming dynasty reflect this fast change.

1356	Zhu Yuanzhang (first Ming emperor) establishes capitol at Nanjing and continues to battle rivals for rule of China.
1363	Ming naval forces are victorious at Poyang Lake Campaign.
1368	Emperor ascends the throne, Ming Dynasty officially begun.
1371	Zheng He born in Yunnan Province.
1380	Mass production of barreled weapons is begun.
1382	Yunnan province subdued by Imperial forces. Zheng He enters the imperial service.
1387	Relations with Japan severed.
1390s	Zheng He fights in campaigns against the Mongols north of the Great Wall as an aide to the Prince of Yen (future Yongle emperor).
1398	Zhu Yuanzhang dies.
1399	Jian Wen takes the throne, contested by the Prince of Yen.
1403	Yongle takes the throne. Shipyards begin to build baochuan. Zheng He named Sanbao Taijian.
1405-1407	1st star raft expedition, pirate chief's forces in Palembang defeated.
1406	Yongle invades Annam (northern Vietnam).

1407-1409	2nd star raft expedition, confers official status on Paramesvara.
1407	Su Yikuan, college for training interpreters, established by the emperor.
1409-1411	3rd star raft expedition, troops fight battle in Ceylon, capture king and court.
1412	*The Fire Drake Artillery Manual* published.
1413-1415	4th star raft expedition, troops intercede in civil war in Sumatra (Sekandar).
1415	Giraffe arrives at the imperial court in October. Eunuch Hou Xian sent to India.
1417-1419	5th star raft expedition, exploration of Arabia and Africa. Siege of Mogadishu?
1420	First large-scale naval defeat of Chinese forces in Annam.
1421-1422	6th star raft expedition, exploration of Arabia and Africa.
1421	Xia Yuanji, revenue minister, sentenced to prison.
1424	Yongle dies. Xia Yuanji, released from prison.
1425	Hung Xi takes the throne. Another large scale naval defeat in Annam.
1426	Xuan Te takes the throne. School for palace eunuchs established.
1431-1433	7th star raft expedition, members of fleet reach Mecca.
1434	Zheng He dies. Expeditions cancelled.
1436	Zheng Tong takes the throne. All ocean-going ship construction halted.

1480 Certain officials request another set of maritime expeditions, emulating Zheng He--denied. Records of the missions destroyed.

1511 Portuguese forces conquer the Malaccas.

1516 Portuguese forces arrive in the South China Sea.

1525 Imperial edict issued commanding the destruction of all seagoing junks with more than two masts. (See quote at end of chapter three.)

Appendix C: Auxiliary Charts

Defense Mapping Agency Charts, published by the Defense Mapping Agency Hydrographic/Topographic Center, Washington D.C., are copied from author's collection. All others courtesy of the Berkeley Map Collection, University of California. Citations appear inset on chart reproductions.

Qui Nhon and Area (Vietnam)

Saigon and Area (Vietnam)

Hlaem Kolam Spit and Area (Thailand)

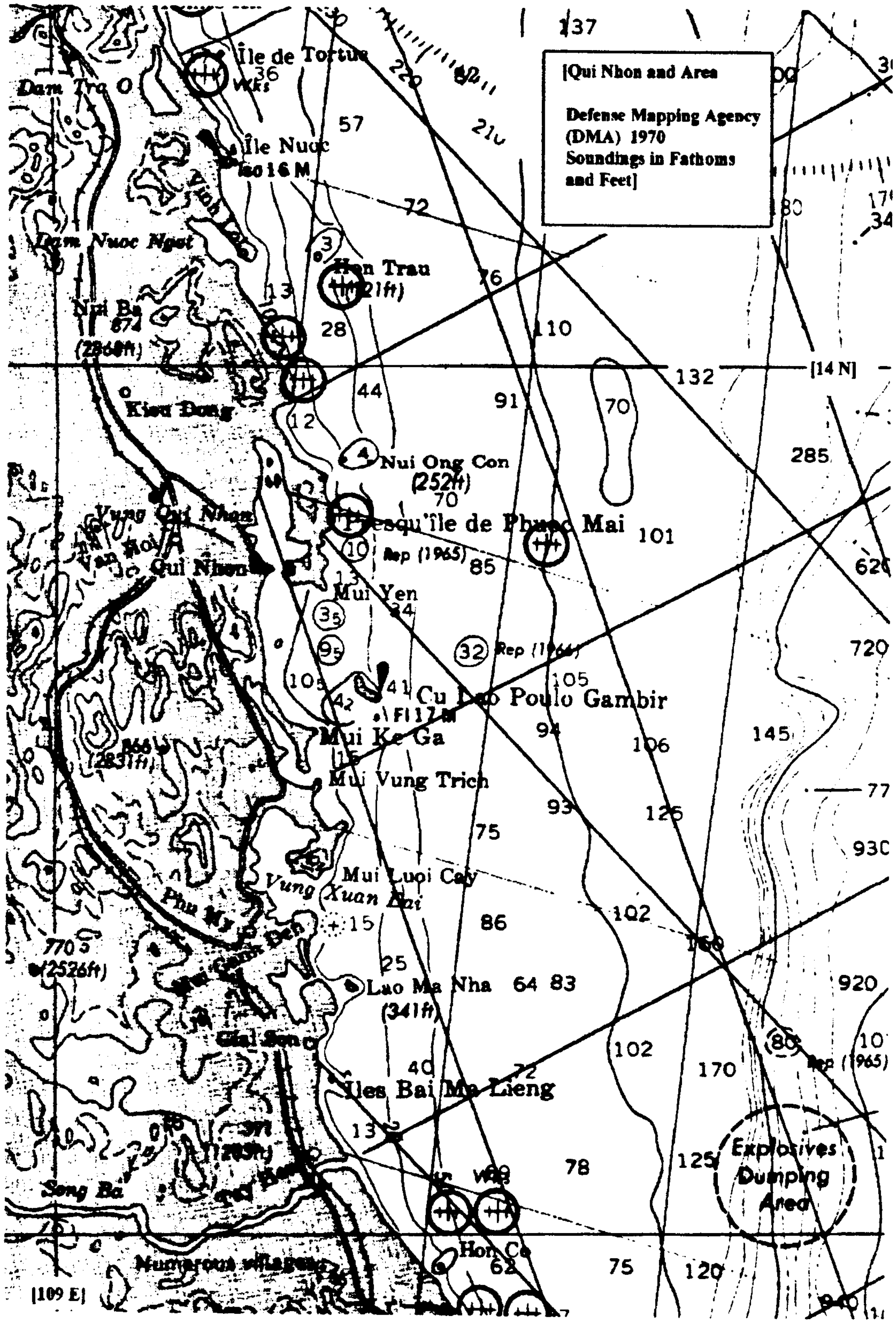
Gulf of Thailand -- Nothern Area (Thailand)

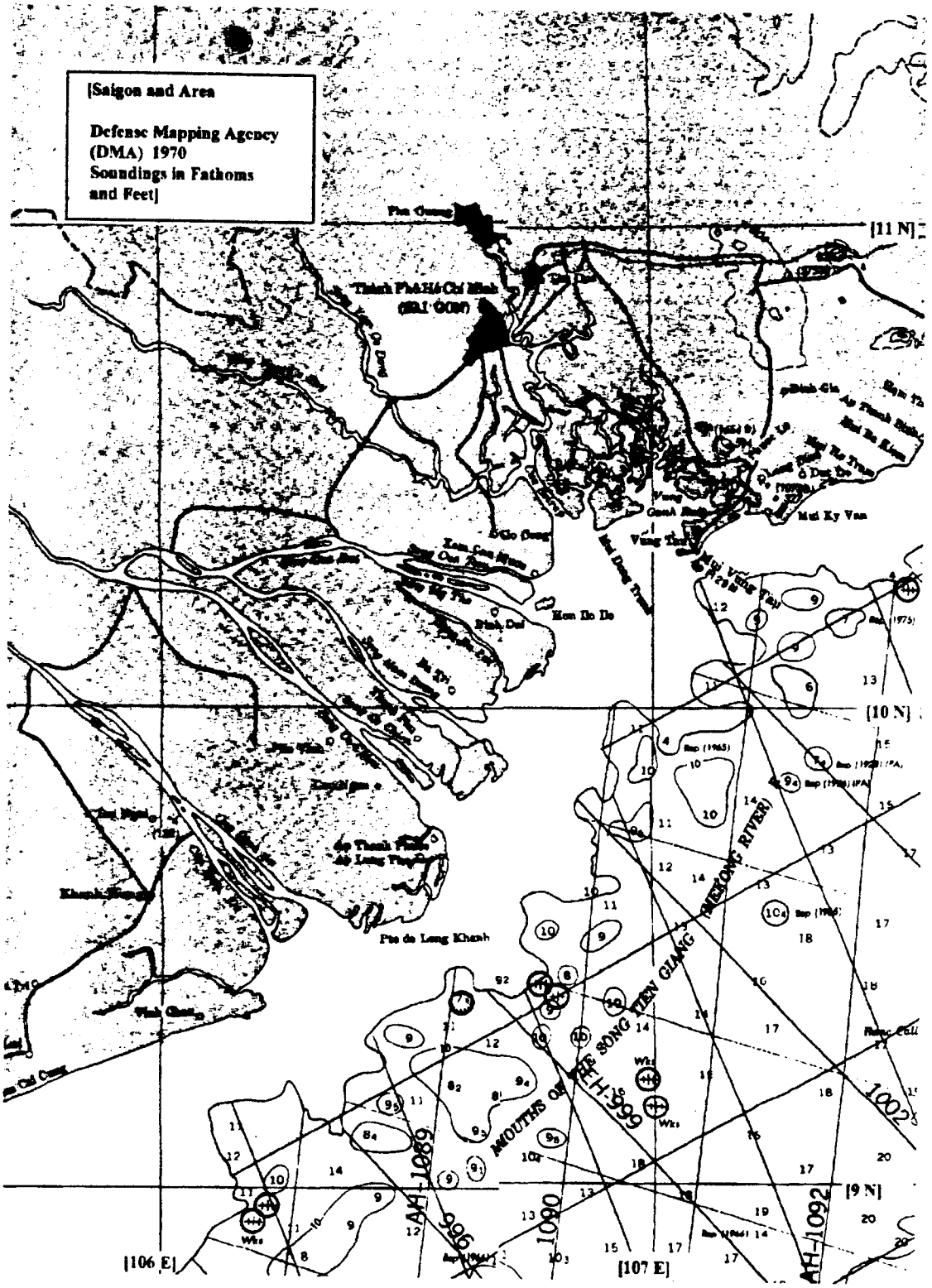
Singapore Strait and Area (Singapore/Malaysia)

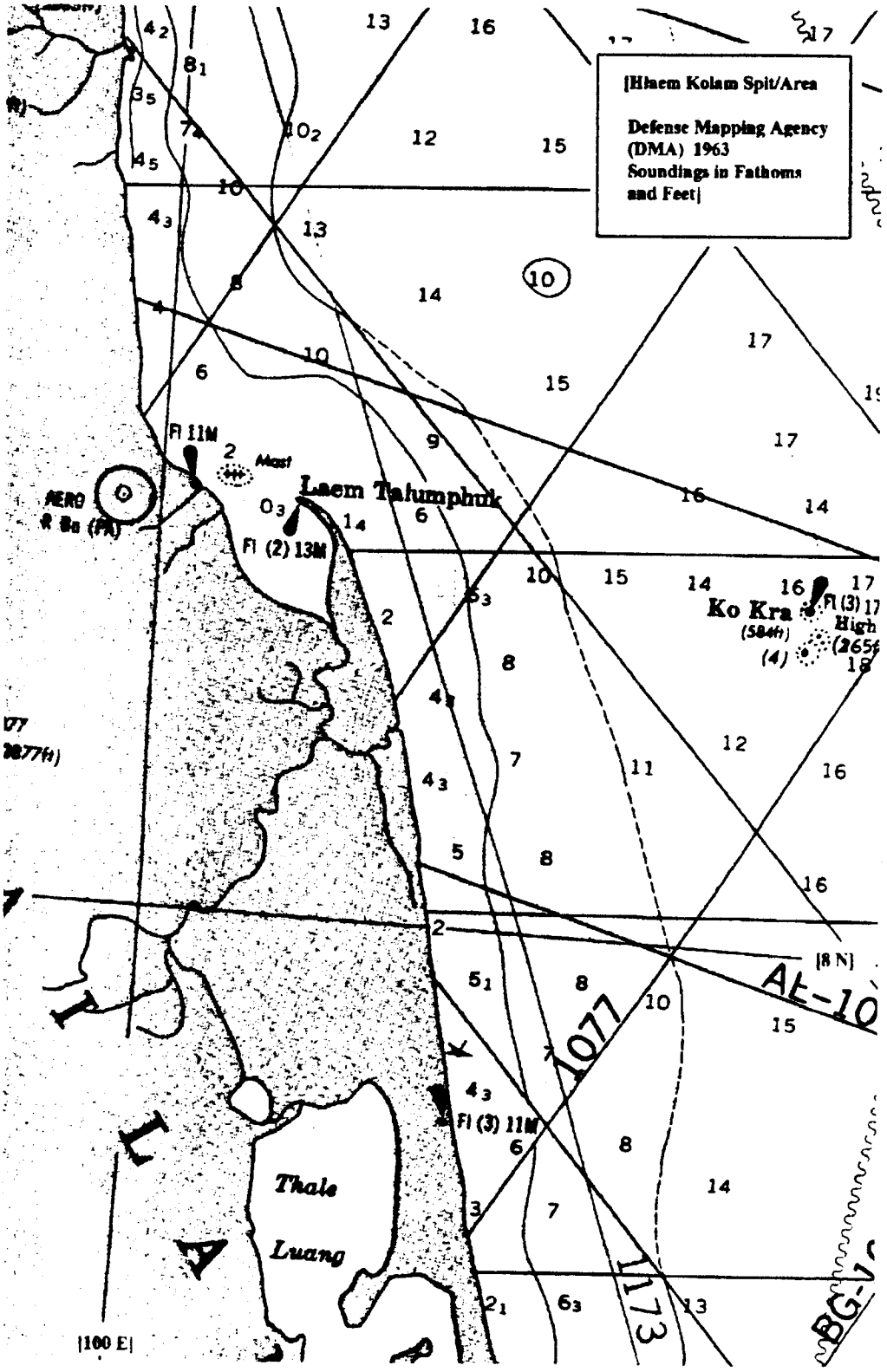
Malacca and Area (Malaysia/Sumatra)

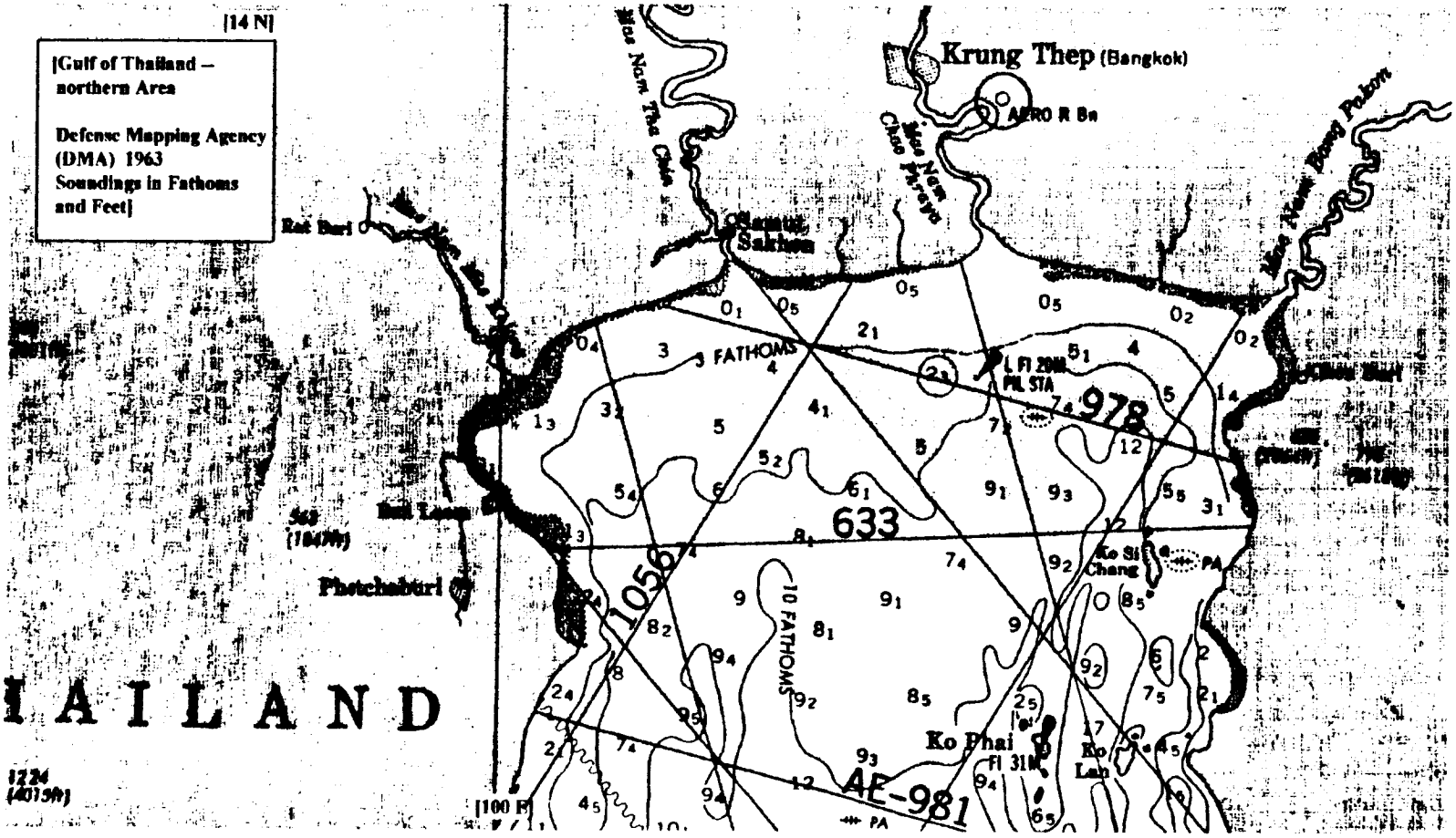
Gresik and Surabaya (Java)

Northwestern Sumatra Area (Sumatra)


[Qui Nhon and Area
Defense Mapping Agency (DMA) 1970
Soundings in Fathoms and Feet]
Île de Tortue
Dam Tra O
Île Nuoc
Dam Nuoc Ngot
Hon Trau
Nui Ba
Kieu Dong
Nui Ong Con
Vung Qui Nhon
Qui Nhon
Presqu'île de Phuoc Mai
Mui Yen
Cu Lao Poulo Gambir
Mui Ke Ga
Mui Vung Trich
Mui Luoi Cay
Vung Xuan Dai
Phu My
Lao Ma Nha
Iles Bai Ma Lieng
Song Ba
Hon Co
Numerous villages
Explosives Dumping Area
[14 N]
[109 E]

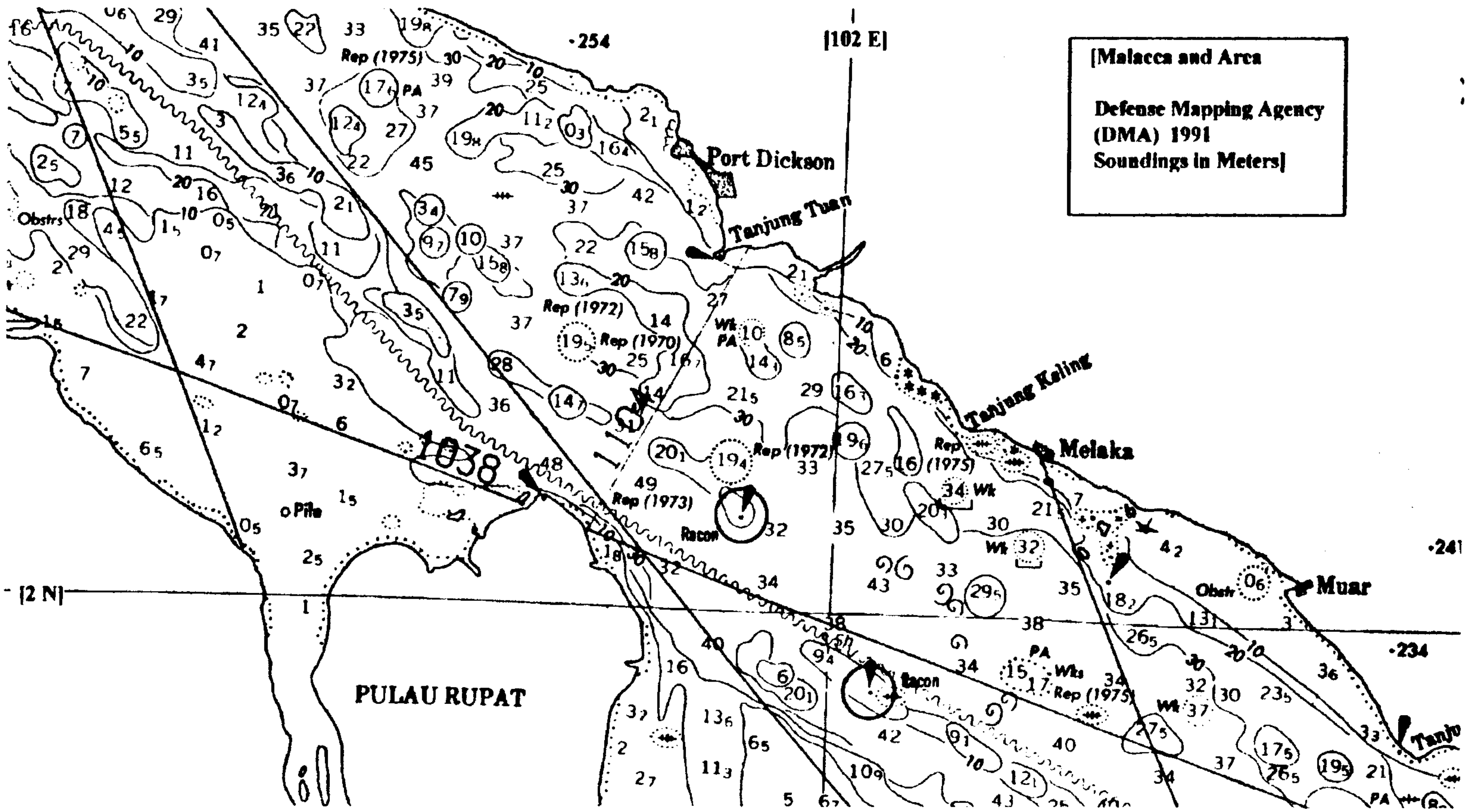

[Saigon and Area
Defense Mapping Agency
(DMA) 1970
Soundings in Fathoms
and Feet]
[11 N]
[10 N]
[9 N]
[106 E]
[107 E]
Thanh Pho Ho Chi Minh
Pho de Long Khanh
MOUTHS OF THE SONG TIEN GIANG (MEKONG RIVER)
AH-1089
AH-1090
AH-1092


[Hlaem Kolam Spit/Area
Defense Mapping Agency
(DMA) 1963
Soundings in Fathoms
and Feet]
Fl 11M
Mast
Laem Talumphuk
Fl (2) 13M
AERO
R Bn (PA)
Ko Kra
Fl (3)
High
(584ft)
(4)
Fl (3) 11M
Thale
Luang
[100 E]
[8 N]
1077
1173


[14 N]
[Gulf of Thailand – northern Area
Defense Mapping Agency (DMA) 1963 Soundings in Fathoms and Feet]
Krung Thep (Bangkok)
AERO R Bn
Mae Nam Chao Phraya
Mae Nam Bang Pakong
Mae Nam Tha Chin
Rat Buri
Samut Sakhon
3 FATHOMS
L Fl 20M
PHL STA
978
633
1056
10 FATHOMS
Ko Si Chang
PA
Ko Phai
Fl 31M
Ko Lan
AE-981
Phetchaburi
THAILAND
[100 F]

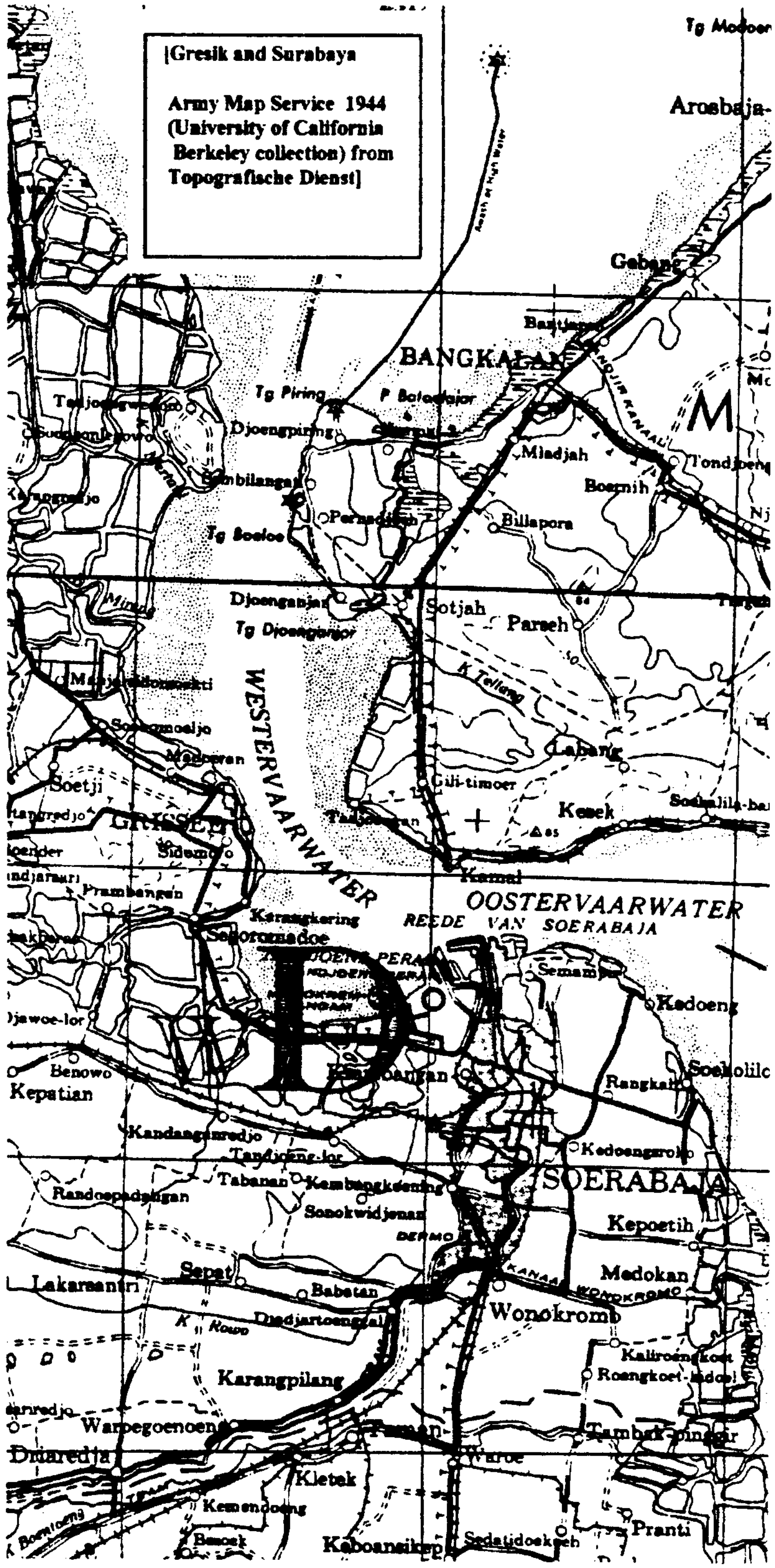
[Singapore Strait and Area

Auteursrecht voorbehouden
Batavia 1934
(University of California
Berkeley Map Collection)]



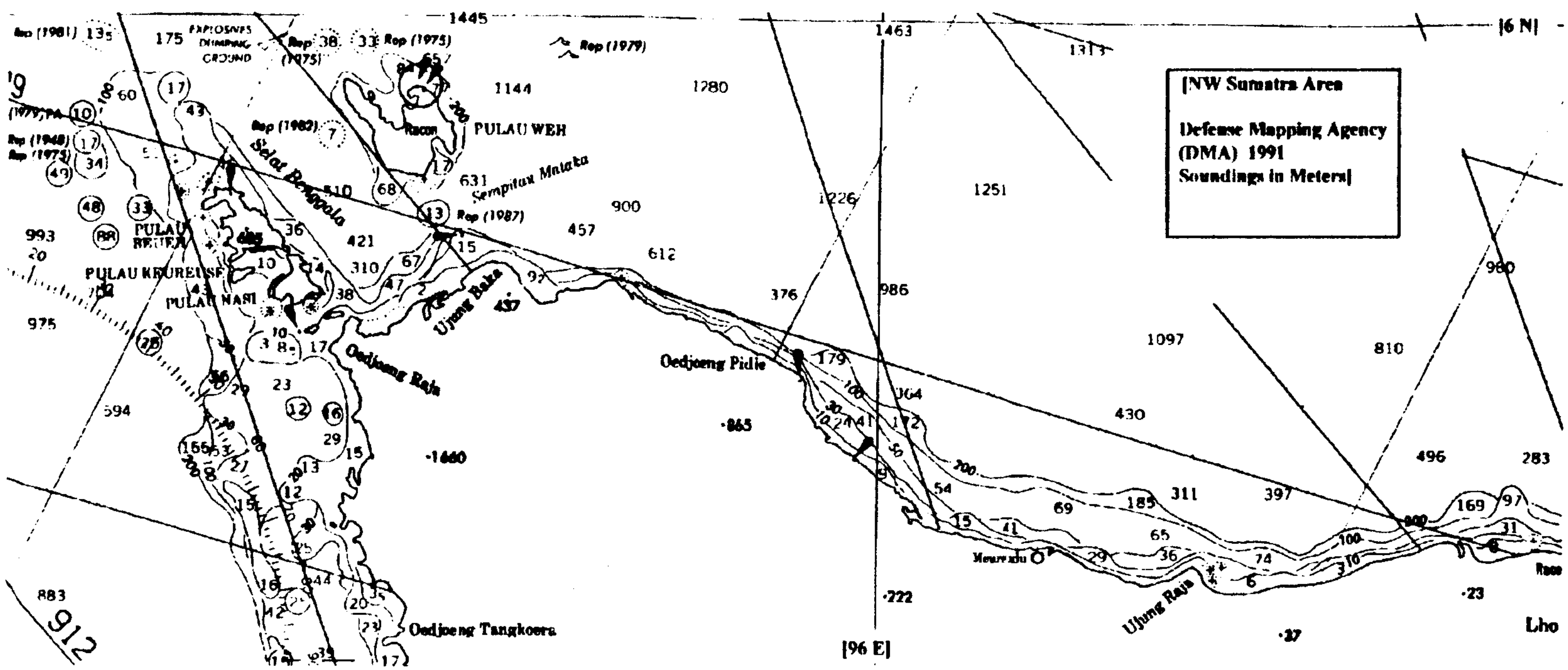
[Malacca and Area

Defense Mapping Agency
(DMA) 1991
Soundings in Meters]



[Gresik and Surabaya

Army Map Service 1944
(University of California
Berkeley collection) from
Topografische Dienst]



[NW Sumatra Area
Defense Mapping Agency
(DMA) 1991
Soundings in Meters]
[6 N]
[96 E]
PULAU WEH
PULAU BREUEH
PULAU KREUREUSE
PULAU NASI
Selat Benggala
Sempitan Malaka
Ujung Raja
Oedjoeng Raja
Oedjoeng Pidie
Oedjoeng Tangkoera
Ujung Raja
Meurudu
Lho
EXPLOSIVES DUMPING GROUND
Rep (1975)
Rep (1979)
Rep (1982)
Rep (1987)
Rep (1981)
Racon

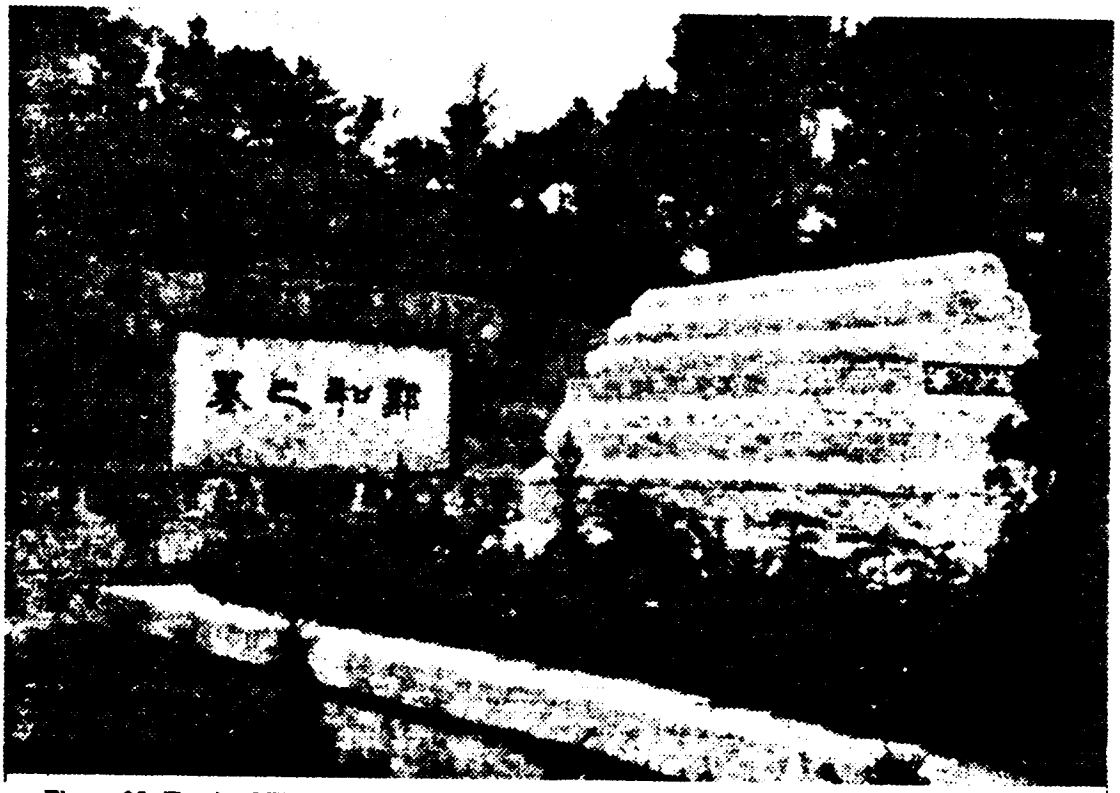


Figure 22: Tomb of Zheng He, Nanjing (Kong, *Sam Po Kong Dan*, 35)

Bibliography

Abinion, O.V. "The Recovery of the 12th century Wooden Boats in the Philippines," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.13 no.2(1989), 1-2.

Anon. *The Archaeology of Peninsular Siam: collected Articles from the Journal of Siam Society, 1905-1983*, Bangkok: Siam Society, 1986.

Anon (History Department of Amoy University). "Geographical Permutations of Ch'uan-chou Harbor and the Overseas Contacts during the Sung-Yuan Period," from Merwin, Douglas (translator), "Selections from *Wen Wu* on the excavation of Sung Dynasty vessel in Quanzhou," *Chinese Sociology and Anthropology*, vol.9 no.3(1977), 54-71.

Anon. "Ancient Wooden Sea-vessel Unearthed," *Peking Review*, no.27(1975), 31.

Anon. "More Money to Protect Relics," *Beijing Review*, vol.35 no.21(1992), 10-11.

Anon. "580th Anniversary of Zheng He Voyages," *People's Republic of China Year Book 1986*, Beijing: Xinhua Publishing House, 1987.

Anon. *New Archaeological Finds in China: discoveries during the Cultural Revolution*, Peking: Foreign Languages Press, 1974.

Atkinson, Karen and Jeremy Green, Rosemary Harper, and Vidya Intakosi. "Joint Thai Australian Underwater Archaeological Project 1987-1988 Part 1: Archaeological Survey of Wreck Sites in the Gulf of Thailand, 1987-1988," *International Journal of Nautical Archaeology*, vol.18 no.4(1989), 299-315.

Atkinson-Millar, Karen. "The First Stage of a Maritime Archaeological Training Programme in the People's Republic of China: a Brief Summary of the Aims, Procedures and Results," *International Journal of Nautical Archaeology*, vol. 19 no.3 (1990), 255-258.

Ayers, J. "The Discovery of a Yuan ship at Sinan, southwest Korea (first report)," *Oriental Art*, N.S. XXIV: 1 (1978), 79-85.

Bard, S.M. "Junk Island," *Journal of the Hong Kong Archaeological Society*, vol.9(1980-81), 12-15.

Barker, Richard. "The Size of the 'Treasure Ships' and Other Chinese Vessels," *Mariner's Mirror*, vol.75 no.1(1989), 273-5.

Besher, Alexander. *The Pacific Rim Almanac*, New York: Harper/Collins, 1991.

Birch, Alan and Y.C. Jao and Elizabeth Sinn (editors). *Research Materials for Hong Kong Studies*, Hong Kong: Centre of Asian Studies, 1984.

Biringuccio, Vannoccio. *Pirotechnia.* 1540, Trans. C.S. Smith. Reprint New York: Institute of Mining Engineers, 1942.

Bixler, Paul. *Southeast Asia: Bibliographic Directions in a Complex Area*, Choice: Connecticut, 1974.

Bloodworth, Dennis and Ching Ping. *The Chinese Machiavelli: 3000 Years of Chinese Statecraft,* New York: Farrer Strous and Giroux, 1976.

Bosselier, Jean. *Ceylon,* Trans. James Hogarth, Geneva: Nagel Publishing, 1979.

Bretschneider, E. "Chinese Intercourse with the Countries of Central and Western Asia during the Fifteenth Century," *China Review,* vol.4(1875), 312.

Bronson, Bennet, and Jan Wisseman. "Palembang as Srivijaya: the Lateness of Early Cities in Southern Southeast Asia," *Asian Perspectives*, vol.19 no.2(1976), 220-239.

Brown, R. "Preliminary Report of the Ko Kram sunken ship," *Oriental Art*, N.S. XXI:4 (1975), 356-70.

Cardwell, Robert. "Pirate Fighters of the South China Sea," *National Geographic,* ser. 6, 89 (May 1946), 787-792.

Carter, George F. "Chinese Contacts with America: Fu Sang Again," *Anthropological Journal of Canada*, vol.14 no.1(1976), 10-24.

Casson, Lionel. "Rome's Maritime Trade with the Far East," *The American Neptune*, vol.48 no.3(1988), 149-153.

Chan, Albert. *The Glory and Fall of the Ming Dynasty,* Norman: University of Oklahoma Press, 1982.

Chan Cheung. "The Smuggling Trade Between China and Southeast Asia during the Ming Dynasty," in Drake, F.S. (ed) *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region*, Hong Kong University Press: Hong Kong, 1967, pp.223-227.

Chan, David B. *The Usurpation of the Prince of Yen, 1398-1402*, Berkeley: University of California Press, 1957.

Chang, Chun-shu. *Premodern China, a Bibliographical Introduction*, Ann Arbor, Michigan: Center for Chinese Studies, 1971.

Chang, K.C. "Chinese Archaeology Since 1949," *Journal of Asian Studies*, vol.26 no.4(1977), 623-646.

Chang, Kuei-sheng. "The Maritime Scene in China at the Dawn of the Great European Discoveries," *Journal of the American Oriental Society*, vol.94 no.3(1974), 347-359.

Chang, Pin-tsun. "The Evolution of Chinese Thought on Maritime Foreign Trade from the Sixteenth to the Eighteenth Century," *International Journal of Maritime History*,vol.1 no.1(1989), 51-65.

Chang, Pin-tsun. "Maritime China in Historical Perspective," *International Journal of Maritime History*, vol.4 no.2(1992), 239-255.

Chang Pin-tsun, "First Chinese Diaspora in Southeast Asia in the Fifteenth Century," in Roderich Ptak and Dietmar Rottermund (eds), *Emporia, Commodities and Entrepreneurs in Asian Maritime Trade, c. 1400-1750* (Stuttgart, 1991), pp.13-28.

Chang, Pin-tsun. "Chinese Maritime Trade: the Case of Sixteenth century Fukien," PhD dissertation Princeton University, 1983.

Chuadhuri, K.N. "Indonesia in the Early Seaborne Trade of the Indian Ocean," *Indonesia Circle*, no.33(1984), 3-13.

Chaudhuri, K.N. *Trade and Civilization in the Indian Ocean*, Cambridge: Cambridge University Press, 1985.

Chen, C.M. and Richard B. Stamps (comps.) *An Index to Chinese Archaeological Works Published in the People's Republic of China, 1949-1965*, Michigan State University Asian Studies Center, 1972.

Chen Yan, "On the Maritime 'Silk Road' and the Cultural Exchange between China and Foreign Countries," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.1-6.

Chen, Ying-chieh. "She Calms the Waves and Cures the Sick," *Free China Review*, vol.22 no.6(1972), 19-22.

Cheng Te-k'un. "Archaeology in Communist China," *The China Quarterly*, vol.23(1965), 67-77.

Cheng Te-k'un. *Studies in Chinese Archaeology*, Hong Kong: Chinese University Press, 1982.

Chen Da-sher. "Synthetical Study Program on the Islamic Inscriptions on the Southeast Coastland on China," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.159-182.

Chin, John M. *The Sarawak Chinese*, Kuala Lumpur: Oxford University Press, 1981.

Chittick, Neville. "Stone Anchor-shanks in the Western Indian Ocean," *International Journal of Nautical Archaeology*, vol.9 no.1(1980), 73-76.

Chiu Ling-Yeong. "Sino-Javanese Relations in the Early Ming Period," in Drake, F.S. (ed) *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region*, Hong Kong University Press:Hong Kong, 1967, pp.214-222.

Chu chieh-chu, "Notes on the Ancient Junks," *Journal of the South Seas Society*, vol.2(?) 1948. (in Chinese)

Chu Yun-ming. *Ch'ien-wen chi* (a record of things once heard) c 1526. Trans. Mayers. *China Review*, vol III (1875), 329.

Christides, Vassilios. "The Transmission of Chinese Maritime Technology by the Arabs to Europe," *The American Neptune*, vol.52 no.1(1992), 38-45. VI A4

Clark, Hugh Roberts "Consolidation on the South China Frontier: the Development of Chuan-chou 699-1126," PhD dissertation, University of Pennsylvania, 1981.

Clark, Hugh R. *Community, Trade, and Networks: Southern Fujian Province from the 3rd to 13th Century*, Cambridge: Cambridge University Press, 1991.

Clark, Hugh R. "The Politics of Trade and the Establishment of the Quanzhou Trade Superintendency," in *China and the Maritime Silk Route*, UNESCO, Fujian, 1991, pp.376-394.

Clark, Paul and Eduardo Conese, Norman Nicolas, and Jeremy Green. "Philippines Archaeological Site Survey, February 1988," *International Journal of Nautical Archaeology*, vol.18 no.3 (1989), 255-262.

Clark, Paul and Zhang Wei. "A Preliminary Survey of Wreck sites in the Dinghai Area, Fujian Province, China," *International Journal of Nautical Archaeology*, vol.19 no.3(1990), 239-241.

Clephan, R. Coltman. "The Ordnance of the Fourteenth and Fifteenth Centuries," *Archaeological Journal*, ser.18, 68 (1911), 49-138.

Colless, B.E. "The Early Western Ports of the Malay Peninsula," *Journal of Tropical Geography*, vol.29(1969a), 1-9.

Crawford, Robert B. "Eunuch Power in the Ming Dynasty," *T'oung Pao*, 49(1961), 144.

Davis, S.G. "History of Archaeology in Hong Kong," *Asian Perspectives*, vol.12(1971), 19-26.

Davis, Tenny L. and J.R. Ware. "Early Chinese Military Pirotechnics," *Journal of Chemical Education*, vol.24(1947), 522-537.

Davis, Tenny L. "Early Pirotechnics: I, Fires for the Wars of China, II, Evolution of the Gun," *Ordnance*, vol.33(1948), 52-3, 180-181.

Dickinson, R.L. "Sketching boats on the China coast," *Proceedings of the Charaka Club*, vol 7 (1931), 97.

Donnelly, Ivan A. *Chinese Junks and Other Native Craft*, Singapore: Graham Brash, 1924.

Drake, F.S. (ed) *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region*, Hong Kong: Hong Kong University Press, 1967.

Dreyer, E.T. *Early Ming China; a Political History 1355-1435*, Stanford: Stanford University Press, 1982.

Duyvendak, J.J.L. *China's Discovery of Africa*, London: Arthur Probsthain, 1949.

Duyvendak, J.J.L. "The True Dates of the Chinese Maritime Expeditions in the Early 15th Century," *T'oung Pao*, XXXIV (1938), 341-412.

Duyvendak, J.J.L. "Desultory Notes on the *Hsi Yang chi*," *T'oung Pao*, vol 42(1953), 1-35.

Ebrey, Patricia Buckley. *Chinese Civilization: a Sourcebook*, New York: Free Press, 1993.

Echevarria, Raymon. "In Search of Ma-yi: is Today's Cebu that Ancient Trading Post?" *Archipelago*, vol.2 no.18(1975), 41-46.

Ecke, Gustav and Paul Demieville. *The Twin Pagodas of Zayton*, Cambridge, Mass.: Harvard University Press, 1935.

Edkins, J, "Chinese Names for Boats and Boat Gear, with Remarks on the Chinese use of the Mariner's Compass," *Journal of the North China Branch of the Royal Asiatic Society*, 2 (1977), 123.

Edwards McKinnon, E.P. "Research at Kota-Cina, a Song-Yuan Period Trading site in East Sumatra," *Archipel*, vol.14(1977), 19-32.

Emmerson, Donald K. The Case for a Maritime Perspective on Southeast Asia," *Journal of Southeast Asian Studies*, vol.11 no.1(1980), 139-145.

Fairbank, John K., ed. *The Chinese World Order*, Cambridge: Harvard University Press, 1968.

Fairbank, John K. and Edwin O. Reischauer and Albert M. Craig. *East Asia Tradition and Transformation*, Boston: Houghton Mifflin Co., 1973.

Farmer, Edward L. *Comparative History of Civilizations in Asia*, Reading, Mass.: Addison Wesley, 1977.

Farmer, Edward L. *Early Ming Government: the Evolution of Dual Capitols*, London: Cambridge University Press, 1976.

Farmer, Edward L. "An Agenda for Ming History: Exploring the Fifteenth Century," *Ming Studies*, no.26(1988), 1-15.

Fenton, Thomas P. and Mary J. Heffron. *Asia and Pacific: a Directory of Resources*, Orbis books: New York, 1986.

Filesi, Teobaldo. *China and Africa in the Middle Ages*, London: Frank Cass, 1972.

Fitch, R.F. "Life Afloat in China," *National Geographic*, 51(1927), 665-686.

Flecker, Michael. "Excavation of an Oriental Vessel of *c.* 1690 off Con Dao, Vietnam," *International Journal of Nautical Archaeology*, vol.21 no.3(1992), 221-244.

Feuerwerker, Albert. "China's History in Marxian Dress," *American Historical Review*, vol.66 no.2(1961), 323-353.

Foccardi, Gabriele. *The Chinese Travelers of the Ming Period*, Venice: Harrowitz, 1986.

Fox, Robert B. "The Archaeological Record of Chinese Influences in the Philippines," *Philippine Studies*, vol.15(1967), 41-62.

Franke, Herbert. "A Song Embassy Diary of 1211-1212, the *Shih-chin Lu* of Ch'eng Cho," *Bulletin de l'ecole Francaise d'extrem Orient*, vol.69(1981), 171-207.

Franke, Wolfgang. *An Introduction to the Sources of Ming History*, Singapore, 1968.

Franke, Wolfgang. "China's Overseas Communications with Southeast Asia as reflected in Chinese Epigraphic Materials," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, 309-322.

Franke, Wolfgang and Ch'en T'ieh-fan. "A Chinese Tomb Inscription of A.D. 1264, Discovered Recently in Brunei," *Brunei Museum Journal*, vol.3 no.1(1973), 91-99. Reprinted in *Sino Malaysiana: Selected Papers*, Wolfgang Franke editor, Singapore: South Seas Society, 1989.

Franke, Wolfgang. *China and the West*, (trans. by R.A. Wilson) Columbia: University of South Carolina Press, 1967.

Frost, R.J. and H.C. Hin and B. Ng. "Sha Tsui, High Island," *Journal of the Hong Kong Archaeological Society*, vol.5 (1974), 22-33.

Fu Zhongwen. "Zayton Port: Two-way Sustenance for the Marine Silk Route," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, 332-343 (in Chinese).

Gernet, Jacques. *Daily Life on the Eve of the Mongol Invasion*, (trans. H.M. Wright) Stanford: Stanford University Press, 1962.

Gladney, Dru C. "Contemporary Ethnic Identity of Muslim Descendants along the Chinese Maritime Silk Route," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.449-483.

Goodrich, L. Carrington and Chao Ying Fang, eds. *Dictionary of Ming Biography, 1368-1644*, New York: Columbia University Press, 1976.

Goodrich, L.Carrington and Feng Chia-sheng. "The Early Development of Firearms in China," *Isis*,vol. 35 (1944), 114-123.

Goodrich, L. Carrington. "Firearms among the Chinese; a Supplementary note," *Isis*, 39(1948), 63.

Goodrich, L. Carrington. "Query on the Connection between Nautical Charts of the Arabs and those of the Chinese before the Days of the Portuguese Navigators," *Isis*, vol.44(1953), 177.

de Graaf, H.J. and Th. G. Th. Pigeaud (translators). *Chinese Muslims in Java in the Fifteenth and Sixteenth Centuries: the Malay Annals of Semarang and Cerbon*, Semarang: Monash University, 1984.

Green, Jeremy. "News, Australia and Southeast Asia," *International Journal of Nautical Archaeology*, vol.20 no.3(1991), 255-257.

Green, Jeremy. "The Ko Si Chang Excavation Report 1983," *Bulletin Australian Institute for Maritime Archaeology*, vol.7 no.2 (1983), 9-37.

Green, Jeremy. "Eastern Shipbuilding Traditions: a review of the evidence," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.10 no.2(1986), 1-6.

Green, Jeremy and Rosemary Harper and Vidya Intakosi. "The Ko Si Chang One Shipwreck Excavation 1983-1985: progress report," *International Journal of Nautical Archaeology*, vol.15 no.2 (1986), 105-122.

Green, Jeremy and Rosemary Harper. "The Excavation of the Ko Kradat wreck site, Thailand," *International Journal of Nautical Archaeology*, vol.11, no.2 (1982), 1164-171.

Green, Jeremy and Rosemary Harper and Vidya Intakosi. *The Maritime Archaeology of Shipwrecks and Ceramics in Southeast Asia; [and] the Ko Si Chang 3 Shipwreck Excavation*, Victoria NSW: Australian Institute for Maritime Archeaology, special publication no. 4, 1987.

Green, Jeremy and Rosemary Harper. *The Excavation of the Pattaya Wreck Site and Survey of Three Other Sites: Thailand, 1982*, Special Publication no. 1. Freemantle: Australian Institute for Maritime Archeology, 1983.

Green, Jeremy. "The Song Dynasty shipwreck at Quanzhou, Fujian Province, People's Republic of China." *International Journal of Nautical Archaeology*, vol.12, no.3 (1983), 253-261.

Green, Jeremy. "The Shinan Excavation, Korea: an interim report on the hull structure," *International Journal of Nautical Archaeology*, vol.12 no.4(1983), 293-301.

Green, Jeremy and Zae Guen Kim. "The Shinan and Wando Sites, Korea: further Information," *International Journal of Nautical Archaeology*, vol.18 no.1(1989), 33-41.

Grijns, C.D. and S.O. Robson, eds. *Cultural Contact and Textural Interpretation*, Holland: Foris publication, 1986. (Travelogue of de Varthema, 1517.)

Groeneveldt, W.P. *Notes on the Malay Archipelago and Malacca compiled from Chinese Sources*, Batavia: W. Bruining, 1876.

Guy, John S. *Oriental Trade Ceramics in Southeast Asia, Ninth to Sixteenth Centuries*, Oxford: Oxford University Press, 1986.

Guy, John S. "Ceramic Excavation Sites in Southeast Asia: a Preliminary Gazatteer," published as *Research Centre for Southeast Asian Ceramics Papers number 3*, Adelaide: Art Gallery of South Australia, 1987.

Guy, John S. "China and the Maritime Silk Route Conference--Quanzhou, South China," *International Journal of Nautical Archaeology*, vol.21 no.1(1992), 70-73.

Hall, D.G.E. *History of South East Asia*, Toronto: MacMillan and Co., 1964.

Harrisson, Barbara. review of *Maritime Archaeology of Shipwrecks and Ceramics in Southeast Asia, Australian Institute for Maritime Archaeology Special Publication No. 4, International Journal of Nautical Archaeology*, vol.19 no.3 (1990), 269-70.

Hartwell, Robert. "Markets, Technology, and the Structure of Enterprise in the Development of the Eleventh-century Chinese Iron and Steel Industry," *Journal of Economic History*, vol.26(1966), 29-58.

Hartwell, Robert M. *Tribute Mission to China, 960-1126*, Philidelphia: RM Hartwell, 1983.

Helsdingen, Willem Henri van. *Cultural Treasures of the East Indies*, New York: Netherlands Information Bureau, 1946.

Heine-Geldern, R. "Research on Southeast Asia: Problems and Suggestions," *American Anthropologist*, vol.48(1946), 149-175.

Heuken, Adolf S.J. *Historical Sites of Jakarta*, Jakarta: Cipta Loka Caraka, 1982.

Hirth, F. *China and the Roman Orient*, Chicago: Ares Publications, 1885.

Ho Chuimei. "Chinese Presence in Southern Thailand before 1500 A.D. from Archaeological Evidence," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.290-306.

Hoffmann, Per and Kwang-nam Choi and Yong-han Kim. "The 14th Century Shinan Ship-Progress in Conservation," *International Journal of Nautical Archaeology*, vol.20 no.1(1991), 59-64.

Hook, Brian, ed. *The Cambridge Encyclopedia of China*, Cambridge: Cambridge University Press, 1982.

Hornell, J. "The Origin of the Junk and Sampan," *Mariner's Mirror*, 20 (1934), 331.

Hoshi, Ayao. *The Ming Tribute Grain System*, Trans. Mark Elvin, Ann Arbor: University of Michigan, 1969.

Howitz, Pensak Chagsuchinda. "Two Ancient Shipwrecks in the Gulf of Thailand: A Report on Archeological Investigations," *Journal of Siam Society*, 65 (1977), 1-22.

Hsiang Ta. "A Great Chinese Navigator," *China Reconstructs*, vol.5 no.7(1956), 11-15.

Hsu Yun-ts'iao. "The Revamping of Oceangoing Sea Routes Made in the Yuan and Ming Dynasties and Repercussions in Southeast Asian History," *Chinese Culture*, vol.19 no.3(Sept. 1978), 49-54.

Hsu Yun Ts'iao. "Notes Relating to Admiral Cheng Ho's Expeditions," *Journal of the Malaysian Branch of the Royal Asiatic Society*, vol.49 no.1(1976), 134-140.

Hsu Hui-lin. "Gunpowder and Ancient Rockets," *China Reconstructs*, no.10, 29(1980), 58-61.

Hucker, Charles O. *The Ming Dynasty; its Origins and Evolving Institutions*, Ann Arbor: Michigan papers in Chinese Studies no. 34, 1978.

Hucker, Charles O. *China: a Critical Bibliography*, Tucson: University of Arizona Press, 1962.

Hucker, Charles O. *China's Imperial Past*, Stanford: Stanford University Press, 1975.

Hucker, Charles O. *China to 1850: a short history*, Stanford: Stanford University Press, 1978.

Hummel, A.W. "Ocean Transport in the Sixteenth Century," *Annual Reports of the Librarian of Congress (division orientalia)*, 1938.

Hutterer, Karl L. "Philippine Archaeology: Status and Prospects," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 235-249.

Ibn Battuta. *Travels in Asia and Africa 1325-1354*, translated by H.A.R. Gibb, London: Routledge and Kegan Paul, 1929 (reprinted 1983).

Intakosai, Vidya. "Rang-Kwien and Samed Ngam shipwrecks," *SPAFA Digest, Journal of SEAMEO Project in Archaeology and Fine Arts*, vol.4 no.2(1983), 30-34.

Inoue, Takahito. "A Nautical Archaeological Study of Kublai Khan's Fleets," Master's thesis, Texas A&M University, 1991.

Jack-Hinton, Colin. *A Sketch Map History of Malaya, Sarawak, Sabah and Singapore*, Singapore: Hilton Educational Publications, 1966.

Jao Tsung-I. "Some place names in the South Seas in the *Yung-Lo Ta-Tien*," in Drake, F.S. (ed) *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region*, Hong Kong University Press:Hong Kong, 1967, pp.191-197.

Jiao, Jian. "Ming Dynasty: Foreign Relations," *China Reconstructs*, vol.29 no.9(1980), 66-7.

Jiao, Jian. "The Yuan Dynasty: Foreign Relations, Science and Culture," *China Reconstructs*, vol.27 no.7(1980), 69-71.

Jiao, Jian. "The Song Dynasty: Northern and Southern Song Culture," *China Reconstructs*, vol.29 no.4(1980), 66-7.

Johnson, David et al eds. *Popular Culture in Late Imperial China*, Berkeley: University of California Press, 1985.

Kapitan, Gerhard. "Ancient two-armed stone-stocked Wooden Anchors--Chinese and Greek," *International Journal of Nautical Archaeology*, vol.19 no.3(1990), 243-245.

Keith, Donald H. and Christian J. Buys, "New Light on Medieval Chinese Seagoing Ship Construction," *International Journal of Nautical Archaeology*, vol.10 no.2(1981), 119-132.

Keith, D.H. "A Fourteenth Century Cargo Makes Port at Last," *National Geographic*, 156:2 (1979), 230-43.

Keith, D.H. "A Fourteenth Century Shipwreck at Sinan-gun," *Archaeology*, 33:2(1980), 33-43.

Kierman, Frank A., ed. *Chinese Ways in Warfare*, Cambridge: Harvard University Press, 1974.

Kim, Z.G. *Report on the Shinan Seabottom Relics Excavation: a study of the submerged hull*, Seoul: Cultural Properties Maintenance Office, 1980.

Kobata, Atsushi and Matsuda Mitsugu. *Ryukyuan Relations with Korea and South Sea Countries*, Kyoto: Kobata (and Harvard-Yenching Inst.), 1969.

Kong Yuan Zhi. *Sam Po Kong Dan Indonesia*, Jakarta: Cv Haji Masagung, 1973.

Kuwabara, Jitsuzo. "P'u Shou-keng, a Man of the Western Regions, who was the Superintendent of the Trading Ships' Office in Ch'uan-chou towards the End of the Sung Dynasty," *Memoirs of the Research Department of the Toyo Bunko*, vol.2(1928), 1-15.

Landstrom, Bjorn. *The Ship*, Netherlands: Allen and Unwin, 1961.

Lao Bomin. ""A 7000 Year-old Oar," in *Ancient Discoveries in Chinese Archaeology*, Beijing: Foreign Language Press, 1984.

Lent, John A. and Kent Mulliner (eds). *Malaysian Studies: Archaeology, Historiography, Geography, and Bibliography*, DeKalb, Illinois, Northern Illinois University, Center for Southeast Asian Studies, 1985.

Leslie, Donald Daniel. *Islam in Traditional China: a Short History to 1800*, Canberra: College of Advanced Education, 1986.

Levathes, Louise. *When China Ruled the Seas: the Treasure Fleet of the Dragon Throne, 1405-1433*, Simon and Schuster: New York, 1994.

Li Guo-Qing. "Archaeological Evidence for the Use of 'chu-nam' on the 13th Century Quanzhou Ship, Fujian Province, China," *International Journal of Nautical Archaeology*, vol.18 no.4(1989), 277-283.

Li Guo-Qing. "Chinese Medieval Sunken Vessels Salvaged in Underwater Archaeology," in *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference*, John Broadwater editor, Society for Historical Archaeology: Richmond, Virginia, 1991, pp.54-57.

Li Yu Kuen. "On the Guardian Angel of the Maritime Silk Route," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.149-157 (in Chinese).

Li Zhi-yan. "The Effect of the Open-up of the Maritime Silk Route on the Development of Chinese Ceramics," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.85-94 (in Chinese).

Lim, Linda Y.C. and Peter Gosling, *The Chinese in Southeast Asia*, Singapore: Maruzan Asia, 1983.

Lin Mingyang. "The Giraffe and Sino-African Friendship," *People's Daily*, Peking. 6/1/83.

Lin Shimin, Du Genqi (translator) and Jeremy Green. "Waterfront Excavations at Dongmenkou, Ningbo, Zhe Jiang Province, PRC," *International Journal of Nautical Archaeology*, vol.20 no.4(1991), 299-311.

Lind, Andrew W. *Nanyang Perspective: Chinese Students in Multiracial Singapore*, Hawaii, University of Hawaii Press, 1974. (Asian Studies Program 13.)

Ling Yang. "Seminar on Archaeological Studies in Asia," *Beijing Review*, vol.26 no.44(1983), 21-22.

Lo Jung-pang. "The Decline of the Early Ming Navy," *Oriens Extremus*, vol. 5(1958), 149-168.

Lo, Jung-pang. "The Emergence of China as a Seapower during the Late Sung and Early Yuan Periods," *Far Eastern Quarterly*, 14 (1955), 489-503.

Lo, Jung-pang. "Maritime Commerce and its Relation to the Sung Navy," *Journal of the Economic and Social History of the Orient* (Netherlands), XII:2 (1969), 57-104.

Locsin, L & C. *Oriental Ceramics discovered in the Philippines*, Tuttle: Japan and USA, 1967.

Lou Tsu-k'uang. "Chinese in Sabah--an Historical Sketch," in *Asian Folklore and Social Life Monographs* (vol.67), Lou Tsu-k'uang editor, Taiwan: Orient Cultural Service, 1975, pp.20-32.

Lou Tsu-k'uang and Wolfram Eberhard. "The Boat People of South China," in *Asian Folklore and Social Life Monographs* (vol.19), Lou Tsu-k'uang editor, Taiwan: Orient Cultural Service, 1972, pp.10-20.

Lou Tsu-k'uang and Wolfram Eberhard. "The Happy Heavenly Bureaucracy: Supernaturals and the Hong Kong Boat People," in *Asian Folklore and Social Life Monographs* (vol.19), Lou Tsu-k'uang editor, Taiwan: Orient Cultural Service, 1972, pp.1-10.

Ma Chao-chun. "I have Received a Profound Class Education," *Chinese Sociology and Anthropology*, vol.5 no.4(1973), 75-79.

Ma Huan. *Triumphant Tour of the Ocean's Shores* (*Ying yai sheng lan*), 1433. Trans. J.V.G. Mills. Reprint London: Cambridge University Press, 1970.

Mackie, J.A.C., ed. *The Chinese in Indonesia: five essays,* Honolulu: University of Hawaii Press, 1976.

MacKnight, C.C. "The Nature of Early Maritime Trade: Some Points of Analogy from the Eastern Part of the Indonesian Archipelago," *World Archaeology*, vol.5 no.2(1973), 198-208.

Makoto Sugawara. "The Divine Wind that Didn't Blow [Mongol Invansion]," *The East*, vol.21 no.4(1985), 9-12.

Manguin, Pierre-Yves. "The Southeast Asian Ship: An Historical Approach," *Journal of Southeast Asian Studies*, vol.11, no.2 (1980), 266-276.

Marr, David G. and A.C. Milner. (eds) *Southeast Asia in the 9th to 14th centuries,* Singapore: Institute of Southeast Asian Studies; Canberra: Research School of Pacific Studies, ANU, 1986.

Mathew, Gervase. "Chinese Porcelain in East Africa and on the Coast of South Arabia," *Oriental Art,* vol. II, ser.2 (1956) 50-55.

Mayers, WF. "Chinese Explorations of the Indian Ocean during the Fifteenth Century, " *China Review*, vol.3(1875), 219- 331.

McRoberts, R.W. "Notes on Events in Palembang: 1389-1511, the Everlasting Colony," *Journal of the Malayan Branch of the Royal Asiatic Society*, vol.59 no.1(1986), 73-84.

Merwin, Douglas (translator). "Selections from *Wen Wu* on the excavation of Sung Dynasty vessel in Quanzhou," *Chinese Sociology and Anthropology*, vol.9 no.3(1977), 3-106.

Meskill, J. (trans. and ed.) *Phyohae-Rok (Chhoe Pu's diary: a record of drifting across the sea), 1488*, Reprint Arizona: University of Arizona Press, 1965.

Mills, J.V. "Notes on Early Chinese Voyages," *Journal of the Royal Asiatic Society* (1951), 17-24.

Mills, J.V. "Chinese Navigators in Insulinde about A.D. 1500," *Archipel*, vol.18(1979), 69-93.

Mitamura, Taisuke. *Chinese Eunuchs: the Structure of Intimate Politics*, Rutland, Vermont: Tuttle Co., 1970.

Moreland, W.H. "Ships of the Arabian Sea about 1500 AD," *Journal of the Royal Asiatic Society*, 63 (1939), 63-75.

Mote, F. and D. Twitchett, ed.s. *The Cambridge History of China*, vol. 7, part 1, Cambridge: Cambridge University Press, 1988.

Mozai, Torao. "The Lost Fleet of Kublai Khan," *National Geographic*, November 1982. 634-649.

Mui, Hoh-cheung. Review of *Essays on the History of Chinese Overseas and Oceanic Development* by Editorial Committee, Academia Sinica, Taiwan 1985, in *International Journal of Maritime History*, vol.1 no.1(1989), 392-5.

Mulder, W.Z. "The Wu Pei Chih Charts," *T'oung Pao*, vol. 37(1944), 1-15.

Natkiel, Richard and Anthony Preston. *The Weidenfeld Atlas of Maritime History*, London: Weidenfeld and Nicolson, *1986.*

Needham, Joseph. *A History of Science and Civilization in China*, vol. IV part 3, vol.V part 7, London: Cambridge University Press, 1971.

Needham, Joseph. "China's Trebuchets, Manned and Counterweighted," In *Humana Civilitas,* edited by Lynn White Festschrift, Cambridge: Hall and West, 1976, pp.107-138.

Needham, Joseph. *Science in Traditional China,* Cambridge: Harvard University Press, 1981.

Nicolle, David. *The Mongol Warlords*, New York: Firebird Books, 1986.

O'Conner, Stanley J. "Tambralinga and the Khmer Empire," in *The Archaeology of Peninsular Siam: Collected Articles from the Journal of the Siam Society*, Bangkok: Siam Society, 1986, pp.135-149.

O'Niell, Hugh. *Companion to Chinese History,* New York: Facts on File Publications, 1983.

Pao Tsun-peng. *On the Ships of Cheng Ho (chung-hua Tshung-shu),* Hong Kong: National Historic Museum collected papers on the history and art of China, no. 2, 1961.

Pearson, Richard. "Archaeological Investigations in Eastern Taiwan," *Asian Perspectives*, vol.11(1968), 137-139.

Pearson, Richard. "The Ryukyus," *Asian Perspectives*, vol.15 no.2(1972), 184-196.

Peralta, J.T. "Ancient Mariners in the Philippines," *Archaeology*, vol.33 no.5(1980), 41-48.

Phillips, G. "The Seaports of India and Ceylon, Described by Chinese Voyagers of the 15th century, together with an Account of Chinese Navigation," *Journal of the Royal Asiatic Society/North China Branch*, vol.20(1885), 209-214.

Polo, Marco, *The Travels,* trans. Ronald Latham, London: Penguin books, 1965.

Ptak, Roderich. "China and the Trade in Tortoise Shell (Sung to Ming Periods)," in Roderich Ptak and Dietmar Rottermund (eds), *Emporia, Commodities and Entrepreneurs in Asian Maritime Trade, c. 1400-1750* (Stuttgart, 1991), pp.195-230.

Purcell, Victor. *The Chinese in Southeast Asia.* London: Oxford University Press, 1951.

Purcell, Victor. *The Chinese in Modern Malaysia*, Singapore: Eastern Universities Press Ltd., 1960.

Qin Zhang Yang. "South-Song Stone Anchors in China, Korea and Japan," *International Journal of Nautical Archaeology*, vol.19 no.2(1990), 113-121.

Quimpo, Emilie Mae F., and Dempsey Pagan jr. "Diving for a Shipload of Porcelain, [with afterword]: Many More Ancient Shipwrecks await Discovery," *Filipinas Journal of Science and Culture* (Makati), vol.4(1982), 33-49.

Raban, Avner. "Medieval Anchors from the Red Sea," *International Journal of Nautical Archaeology*, vol.19 no.4(1990), 299-306.

Ray, Haraprasad. "Bengal's Textile products Involved in Ming Trade during Cheng Ho's Voyages to the Indian Ocean and Identification of the hitherto Undeciphered Textiles," in Roderich Ptak and Dietmar Rottermund (eds), *Emporia, Commodities and Entrepreneurs in Asian Maritime Trade, c. 1400-1750* (Stuttgart, 1991), pp.81-94.

Ray, Himanshu Prabha. "Early Maritime Contacts Between South and Southeast Asia," *Journal of Southeast Asian Studies*, vol.20 no.1(1989), 42-54.

Reid, A. "The Structure of Cities in Southeast Asia, 15th to 17th Century," *Journal of Southeast Asian Studies*, vol.11 no.2(1980), 235-250.

Reid, Anthony. "Southeast Asian Cities before Colonialism," *Hemisphere*, vol.28 no.3(1983), 144-149.

Reid, Nancy Mills and Michelle Berry. "Joint Thai-Australian Underwater Archaeological Project 1987-1988 Part 2: Thailand Project, Conservation Activities in 1987," *International Journal of Nautical Archaeology*, vol. 18 no.4(1989), 317-320.

Reischauer, Edwin O. Notes on T'ang Dynasty Sea Routes," *Harvard Journal of Asiatic Studies*, vol.5(1940), 142-164.

Rockhill, W.W. "Notes on the Relation and Trade of China with the Eastern Archipelago and the Coasts of the Indian Ocean during the 14th century," *T'oung Pao*, vol.16(1915), 61-159.

Ronquillo, W.P. "Philippine Underwater Archaeology: Present Research Projects and new Developments," *Bulletin of the Australian Institute for Maritime Archaeology*, vol.14 no.1(1990), 21-24.

Rossabi, Morris. *China Among Equals: 10th-14th Century Foreign Relations*, Berkeley: University of California Press, 1983.

Rossabi, Morris. *Khubilai Khan, his Life and Times,* Berkeley: University of California Press, 1988.

Rossabi, Morris. "Cheng Ho and Timur: any Relation?" *Oriens Extremis*, vol.20 no.2(1973), 129-136.

Sarton, George and L. Carrington Goodrich. "A Chinese Gun of 1378," *Isis*, vol.35 (1944), 177 and 211.

Schlegel, G. "On the Invention and Use of Firearms and Gunpowder in China, Prior to the Arrival of the Europeans," *T'oung Pao*, vol.3 (1902), 1-11.

Schwartzberg, Joseph E. (ed) *A Historical Atlas of South Asia,* New York: Oxford University Press, 1992.

Scott, William Henry. "Boat-building and Seamanship in Classic Philippine Society," *Philippine Studies*, vol.30 no.3(1982), 335-375.

Selling, Eleanor. "The evolution of trading states in Southeast Asia before the 17th century," PhD dissertation, Columbia University, 1981.

Shee Sung. "The Contribution of Chinese Merchants to the Trade Relations between Sung China and Koryo," *Chinese Culture*, vol.18 no.4(1977), 1-18.

Siu Kwok-Kin and William Meacham. "On the Question of an Early Customs House at Junk Island," *Journal of the Hong Kong Archaeological Society*, vol.9(1980-81), 95-99.

Snow, Phillip. *The Star Raft, China's Encounter with Africa,* New York: Weidenfeld and Nicholson, 1988.

Soejono, R.P. "Archaeological Research in Indonesia," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 212-216.

Solheim, Wilhelm G, II. "Archaeology and Anthropology in Southeast Asia," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 175-181.

Somaratne, G.P.V. "Grand Eunuch Ho and Ceylon," *Journal of the Royal Asiatic Society/Ceylon Branch*, n.s., XV, 36-47.

Song Shipwreck Archaeological Group. "The Song Dynasty Shipwreck Excavated at Quanzhou Harbor," *Wen Wu*, 10, a (1975), 1-18.

Song Shipwreck Archaeological Group. "The Song Dynasty Shipwreck Excavated at Quanzhou Harbor," Report, (in Chinese).

Song Shipwreck, Department of History Xiamen University. "History of the Port of Quanzhou in the Song and Yuan Dynasties," *Wen Wu*, 10, b(1975), 19-23.

Song Shipwreck Reconstruction Group. "The Reconstruction of the Ship after Recovery," *Wen Wu*, 10, d (1975), 28-34.

Sopher, David Edward. *The Sea Nomads: a Study based on the Literature of the Maritime Boat People of Southeast Asia,* Singapore: Memoirs of the National Museum 5, 1965.

SPAFA workshop. *Studies on Srivijaya*, Jakarta: Proyek Penelitian Purbakala, 1979.

Suryadata, Leo. *The Ethnic Chinese in the ASEAN States: bibliographical essays.* Singapore: Institute of Southeast Asian Studies, 1989.

Su Chung-jen. "Places in Southeast Asia, the Middle East, and Africa visited by Cheng Ho and his Companions (A.D. 1405-1433)," from Drake, F.S. (ed) *Symposium on Historical, Archaeological, and Linguistic Studies on Southern China, South East Asia and the Hong Kong Region*, Hong Kong University Press:Hong Kong, 1967, pp.198-211.

Sun Tzu. *The Art of War,* circa 400 B.C. Trans. Samuel B. Griffith. Reprint London: Oxford University Press, 1963.

Sung, Shee. "The Contributions of Chinese Merchants in the Trade Relations between Sung China and Koryo," *Chinese Culture*, vol.18 no.4(1977), 1-18.

Sutlive, Vinson H. and Lucas Chin and David McCredie. "Archaeology and Anthropology in East Malaysia and Brunei," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 182-204.

Swanson, Bruce. *Eighth Voyage of the Dragon,* Annapolis: Naval Institute Press, 1982

Taha, A.H. "Current Status of Underwater Archaeology in Malaysia," *Bulletin of the Australian Instutute for Maritime Archaeology*, vol.13 no.2(1989), 3-4.

Taha, Adi Haji. "Archaeology in Peninsular Malaysia: Past, Present, and Future," *Journal of Southeast Asian Studies*, vol.18 no.2(1987), 205-211.

T'ien Ju-k'ang. "Zheng He's Voyages and the Distribution of Pepper in China," *Journal of the Royal Asiatic Society*, no.2(1981), 186-197.

Temple, Robert. *The Genius of China; 3000 Years of Science, Discovery, and Invention*, New York: Simon and Schuster Inc., 1986.

Tjan Tjoe Som. "Chinese Historical Sources and Historiography," in *An Introduction to Indonesian Historiography*, Soedjatmoko *et al* editors, New York: Cornell University Press, 1965, pp.194-205.

Underwood, H.H. *Korean Boats and Ships*, Seoul: Yonsei University Press, 1979.

UNESCO. *China and the Maritime Silk Route*, (Quanzhou International Seminar) Fujian: Fujian People's Publishing House, 1991.

van Nouhuys, J.W. "Chinese Anchors," *Mariner's Mirror*, vol II (1925), 96.

Vermeer, Eduard B. *Chinese Local History*, Boulder: Westview Press, 1991.

Vogel, J.P. "The Ship of Boro-Budur," *Journal of the Royal Asiatic Society* (1917), 367.

Wang Gungwu. "The Nanhai Trade: a Study of the Early History of Chinese Trade in the South China Sea," *Journal of the Malayan Branch of the Royal Asiatic Society*, vol.31(1958), 1-133.

Wang Gungwu "Early Ming relations with Southeast Asia: a Background Essay," in JK Fairbank (ed) *The Chinese World Order*, Cambridge: Harvard University Press, 1968, pp.34-62.

Wang Gungwu. *Community and Nation: Essays on Southeast Asia and the Chinese*, Singapore: Asian Studies Assoc. of Australia, 1981.

Wang Gungwu. *China and the Chinese Overseas*, Singapore: Times Academic Press, 1991.

Wang Ts'eng-yu. "The Shipbuilding Industry in the Sung Dynasty," in Merwin, Douglas (translator), "Selections from *Wen Wu* on the excavation of Sung Dynasty vessel in Quanzhou," *Chinese Sociology and Anthropology*, vol.9 no.3(1977), 72-87.

Wang Yi-t'ung. *Official Relations between China and Japan, 1368-1549*, Cambridge: Harvard University Press, 1953.

Waters, D.W. "Chinese Junks: the Pechili trader," *Mariner's Mirror*, 25: (1939), 62-87.

Waters, D.W. "Chinese Junks: the Antung Trader," *Mariner's Mirror*, vol. 24(1938), 49-67.

Wheatley, Paul. "Geographical Notes on Some Commodities Involved in Sung Maritime Trade," *Journal of the Malayan Branch RAS*, vol.32 no.2(1959), 5-140.

Wilkinson, Endymion. *The History of Imperial China: a research guide*, Cambridge: Harvard University Press, 1974.

Willets, William. "The Maritime Adventures of Grand Eunuch Ho," *Journal of South-East Asian History*, vol.2 (1964), 25-42.

Willmott, Donald Earl. *The Chinese of Semarang: a Changing Minority Community in Indonesia*, New York: Cornell University Press, 1960.

Wills, John E. jr. "Maritime Asia, 1500-1800: The Interactive Emergence of European Domination," *American Historical Review*, vol.98 no.1(1993), 83-105.

Wolters, Oliver W. "Landfall on the Palembang Coast in Medieval Times," *Indonesia*, no.20(1975), 1-57.

Woodside, A.B. "Early Ming Expansionism (1406-1427): China's Abortive Conquest of Vietnam," *Papers on China* (Seminars at Harvard University), vol.17 (1963), 1-37.

Woodside, Alexander. Review of *The Southern Expansion of the Chinese People* by C.P. Fitzgerald, Praeger pub. New York, 1972, in *Harvard Journal of Asiatic Studies*, vol.33(1973), 282-286.

Worcester, G.R.G. "The Chinese War Junk," *Mariner's Mirror*, vol.34 (1948), 16.

Worcester G.R.G. *Sail and Sweep in China*, London: HMSO, 1966.

Worcester, G.R.G. *The Junks and Sampans of the Yangtze*, Reprint, Annapolis: Naval Institute Press, 1971.

Wright, Leigh J. "Pirates of the Archipelagoes," *Orientations*, vol.11 no.6(1980), 50-54.

Wu Chi-hua. "Basic Foreign-policy Attitudes of the Ming Dynasty," *Journal of Oriental Studies*. vol.16 no.1(1978), 102 (English abstract of Chinese article).

Wu Pei-yi. *The Confucian's Progress*, Princeton: Princeton University Press, 1990.

Xia Nai. "A General Survey of China's Archaeological Work," *Beijing Review*, vol.26 no.44 (1983), 23-25.

Xie Fang, "A Brief Account of the Chinese Pirates in the Sixteenth-Seventeenth Centuries and the Silk Road on the Sea," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.46-64 (in Chinese).

Yang Qin Zhang. "New Evidence of Cultural Contacts Between Quanzhou and Southern India During the Yuan Dynasty," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.194-207 (in Chinese).

Yu Lu. *South China in the 12th Century: a translation of Lu Yu's travel diaries, July 3-Dec. 6, 1170*, Chun-shu Chang and Joan Smythe translators, Hong Kong: Chinese University Press, 1981.

Zhou Shu. "Volumes Describe Early Navigator," *Beijing Review*, vol.28 no.34(1985), 38.

Zhuang Wei Ji. "A Research into the Ship of the Song Dynasty--Private Ship of Pu," in *China and the Maritime Silk Route*, Fujian: UNESCO, 1991, pp.344-353 (in Chinese).