International Zheng He Society (Singapore) was established in 2003. It is an association of a group of people interested in Zheng He. It aims at promoting the study of Zheng He's exploration worldwide, especially Southeast Asia and its impact on the region. It also aims to foster cooperation with other research organizations which are involved in the study and research of Zheng He.

The **Institute of Southeast Asian Studies (ISEAS)** was established as an autonomous organization in 1968. It is a regional centre dedicated to the study of socio-political, security and economic trends and developments in Southeast Asia and its wider geostrategic and economic environment.

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Admiral Zheng He & Southeast Asia

Edited by
Leo Suryadinata

International Zheng He Society
Singapore

ISEAS
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Singapore

Chapter 9

LONGYAMEN IS SINGAPORE: The Final Proof?

Chung Chee Kit

INTRODUCTION

Ever since I was a child, Admiral Zheng He[1] has held my imagination. I remember very well the stories which my father told me about his exploits. When I studied Chinese history during my secondary school days, I was disappointed that his entire enterprise was worth only three or four lines in the history text; and yet there were chapters after chapters of Columbus, Vasco da Gama, Bartholomew Diaz, Magellan and Captain Cook. I wondered whether there was a worldwide conspiracy to keep the great findings of this remarkable Asian navigator a secret. That drove me to want to find out more about him.

My fascination about him grew after I graduated in Naval Architecture, and began working as an engineer in Keppel Shipyard. My understanding of the technical aspects of seafaring made me realize that the technologies which he employed was very advanced. The shipyard where I worked was at the "Longyamen"

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itself. Many a time I stood at the wharves at Telok Blangah and Bukit Chermin and imagined the ghosts of the great Treasure Fleet sailed pass in my mind's eye.

"THE FRIENDS OF ADMIRAL ZHENG HE"

I was not alone in this fascination. My colleague in Keppel Shipyard, Mr Ng Siong Tee, held a similar passion. While mine was more technical and marine based, his interests was the historical, cultural and religious significance of Zheng He's voyages. Over the year, he accumulated a collection of models and books on the subject. Last year, we felt that it was time to put our lifelong passion into something more concrete. We decided to set up a special interest group — "The Friends of Admiral Zheng He". We were very pleasantly surprised to find that there is an underground community of secret Zheng He admirers who is beginning to make themselves known.

WHY IS THE LOCATION OF LONGYAMEN IMPORTANT TO SINGAPOREANS?

Why should Singaporeans be interested in whether Longyamen is Singapore? Is it an issue that needs to be resolved now? Why not let this controversy go on and on? The reasons are as follow:

Did Zheng He Pass by Singapore?

In 1992, the whole Western world was abuzz with activities relating to the 500th anniversary of Christopher Columbus' discovery of the New World. All over the Americas, there were celebratory events, from the Tall Ships Festivals, conventions, seminars and exhibitions, to demonstrations by native Americans. Besides its significance to the leisure and tourism industries, an important

anniversary like this serves to spur on scholarship, understanding and, indeed, reassessment of the original event.

The 600th Anniversary of Zheng He's voyages is just round the corner. His first voyage began in the summer of 1405. If the Columbus Centennial is any thing to go by, Asia will see a great revival of interest of Zheng He. And this time, the interest will not only be confined to Asia. Partly due to the growing importance of China (and therefore all things Chinese), and the effort of such people like Gavin Menzies, whose bold claims about the discovery of Zheng He's fleets have made the West sit up and notice this name, the 600th Anniversary will also attract the attention of the West.[2] How can Singapore take advantage of this celebratory event?

Certain locations and ports are clearly linked to Zheng He's voyages, examples being: Nanjing, Quanzhou, Malacca, Aceh, Semarang, Sri Lanka, Hormuz etc. Singapore as we now know it did not exist in the 15th century. There is no record of Zheng He ever landing here. Therefore we cannot claim that we were a port of call of the Treasure Fleet. However, the "Zheng He Navigation Chart" (郑和航海图) marked an important sailing route between China and the Western Oceans, and it went by a place called Longyamen. It was an important landmark. If Longyamen was indeed Singapore, the pre-colonial Singaporeans would have had the wonderful treat of watching the magnificent Treasure Fleet sailing right pass their shores. We can then claim our place in the worldwide celebration of Zheng He's anniversary as *the place whose waters the Admiral must pass on his way to the West.*

The Location of Temasek

The second reason for the importance of resolving this issue is that the location of Longyamen is related to the location of Temasek.

The *existence* of Temasek is well recorded in Chinese, Malay[3] and Javanese[4] text. The *location* of Temasek however was fixed through reference to Chinese texts alone. Several references of Temasek (Tumasik) occurred in the Chinese records as being next to or near Longyamen. Therefore, by refuting that Longyamen is Singapore (as Mr Lin Wo Ling has done[5]), we open up the Pandora box of Temasek not being Singapore.

Purely at an emotional level, as a Singaporean, I cannot accept this. Singapore's historical heritage is so meagre that I cannot bear the thought of losing this defining identity of our island nation. Yet, if those of us who believe otherwise choose to keep quiet, people may come to accept that Longyamen is indeed somewhere else, especially if eminent scholars also accept this view. We will lay open the possibility that one day history will be revised, perhaps by non-Singaporeans. In that day, we may have to rename Temasek Holding as Riau Holdings, or Temasek Junior College as Lingga Junior College.

Contributing to More Holistic Study of the Subject

A third reason for wanting to resolve the issue of whether Longyamen is Singapore is that in every field of study, the deep approach adopted by experts in their area of specialisation must be balanced by a broad and holistic approach moderated by understanding from other related disciplines. My sense of the past study of the Longyamen matter is that it was mostly looked upon as a historical issue, and hence there was a tendency to depend on ancient (in many cases tenuous and indirect) references to draw inferences. I believe that the validity of many such inferences can readily be checked through cross references to other disciplines. For example, much of the attempt to determine the location of a place was through the etymology of the place names. From an

outsider, I find it amusing when one scholar refuted the hypothesis of another by suggesting that his Fujian dialect is lacking. Using such a criterion, I will be totally unsuited to study ancient Chinese maritime matters, as I can only speak Cantonese. (Gavin Menzies, of course, would not qualify at all.)

It is precisely because I know that my background is different from those who traditionally commit themselves to this area of study that I hope I may be able to bring some new angles to this subject.

SUMMARY OF PAST STUDIES

The location of Longyamen has been debated by many scholars. The following is a short summary of the different proposals by these scholars.

Longyamen is Lingga Straits

This view was put forward by W. P. Groeneveldt in 1876.[6] He suggested that Longyamen is at the so-called Lingga Straits.[7] He relied on Fei Xin's *Xing Cha Sheng Lan*[8] which referred to Longyamen being "Northwest of San-Fo-Chi". Subsequent scholars, including Friedrich Hirth and W. W. Rockhill[9] endorsed this view, but used other sources (*Zhu Fan Zhi*[10] and *Dong Xi Yang Kao*[11]). In so doing, he introduced the complication of the name "Ling-ya-mon" (凌牙门) into the controversy. Rockhill recognized the possibility that Ling-ya-mon and Longyamen are different places.

Longyamen is Johor Lama

This was put forward by Mr Han Wai Toon (韩槐准) in the 1940s. His proposal was prompted by the discovery of pre-Song ceramic pieces on the eastern shore of the Johore River. According to him,

Longyamen was located at the eastern end of the Johore Straits, and Tan-Ma-Hsi Men was located at the western end of the Johore Straits between "Tanjong Tua and Tanjung Bulus". His argument was supported by his interpretation of the sailing direction noted in the "Dong Xi Yang Kao", (东西洋考). Mr Han's proposal was supported by Mr H. D. Collings of the Raffles Museum.

Longyamen is Singapore Main Straits

This view was put forward by Mr J. V. Mills, who had much sailing experience in Singapore waters. According to him Longyamen is the Main Straits of Singapore (ie. between Sentosa and Batam). He used the *Wu Bei Zhi* (武备志) (commonly known as the *Zheng He Navigation Charts*—郑和航海图) to prove his point. However, his interpretation of Chinese compass bearings have been disputed by Mr Xu Yun Qiao and lately Mr Lin Wo Ling.

Longyamen is Keppel Harbour

This was put forward by Mr Xu Yun Qiao (许云樵). According to him, Longyamen and Tan-ma-hsi is the same place. Amongst other arguments, he used the Pilots' Directory *Dong Xi Yang Kao* and the *Xing Cha Sheng Lan* to prove his point. His view was strongly supported by Mr Roland Braddell, who wrote a definitive piece arguing the case in a well-known journal.[12]

This view was taken to be orthodox until the recent publication by Mr Lin Wo Ling.

REASONS FOR CONTROVERSY ON THE LOCATION

Several reasons can be put forward to explain why it has been so difficult to firmly establish the location of Longyamen. These include:

- Existence of different places with the same Chinese name; alternatively, the same place is given different Chinese names in different records. Places such as Longyamen (龙牙门/凌牙门/龙牙大山), Chang Yao Yu (长腰屿), Jia Li Men (吉利门/吉里闷/加利闷), Bai Jiao/Shi Jiao (白礁/石礁) are such examples.
- Introduction of spurious candidates or arguments through speculation on etymology of toponyms.
- Different approaches to the interpretation of Chinese compass bearings.
- Insufficient understanding of maritime usage to fully interpret navigation data contained in the various ancient Pilots' Directories.[13]

It is in this last area that this paper hopes to contribute to the understanding of this subject.

SHORT DISCUSSION ON CHINESE MARITIME TECHNOLOGY

Part of the joy of studying Zheng He's voyages is that it reveals a wonderfully advanced state of Asian maritime technology some six hundred years ago. At the time when Prince Henry the Navigator first promoted the systematic study of the mariner's art in Portugal, most of the difficult navigational problems were already fully resolved in the Far East, and international maritime trade was flourishing to such a degree that it was common place to see Arabia dhows and Chinese junks together in the same port.

An understanding of the ship operations and maritime usages in the 15th century will not only bring new insights to the study

of the life and deeds of Zheng He, but will also help separate facts from fiction by sieving out those events that are not technically possible by the technology of that time. With that in mind, I would like to give a short summary of the achievement of Chinese[14] maritime practices at the time of Zheng He.

The Junk — A Misnomer

There is a tendency to think of the Junk as somehow technologically backwards. However, in the 15th century, and right up to the time of the steamship, the Junk was the most efficient vessel afloat. In 1405, when Zheng He was setting sail with his magnificent fleet, the maritime nations of the West were sailing with small carracks. These are square rigged vessels with rather unstreamlined hull forms that were slow and inefficient. One reason was that they were developed for coastal trading, as for example, amongst the nations of the Hanseatic League in Northern Europe. Up till the age of Diaz and Vasco da Gama, there was no requirement for transocean voyages in Europe.

In contrast, regular transocean voyages have been attempted before the Tang dynasty in Asia. Persian vessels regularly call Chinese ports. There are records of sea voyages by Buddhist pilgrims to Srivijaya, India and beyond abound. Therefore, in the year 1405, the Chinese junk already had the following characteristics:

- Seaworthy and seakindly — providing for the safety as well as the comfort of the crew.
- Economically efficient — economical use of men and material, making it a viable vehicle for trade.
- Technologically advanced — with ability to sail close to the wind at good, dependable speeds.

Watertight Compartments

The Chinese have been building vessels with watertight compartments. Travellers like Ibn Battuta and Marco Polo all marveled at this safety feature, which was not introduced into Western shipping until the mid-nineteenth century. We are all familiar with the sinking of the Titanic, which boasted of its watertight compartments as an advanced technology. That was in the beginning of the 20th century! The Chinese vessels had as much as 13 or 14 compartments. Chinese vessels were built with this feature as far back as the 2nd century AD.

The presence of these watertight partitions (or bulkheads) also affected the shipbuilding and designs of Chinese junks. They provided many strong points from which masts can be erected. Therefore, multi-masted vessels appeared in China long before they appeared in Europe. Ibn Battuta reported seeing Chinese vessels off the Malabar coast with 12 sails and 1000 men on board (600 sailors and 400 soldiers) during the Yuan period. The famous Baochuan of Zheng He had 9 masts.

Because the hull of the ship is constructed more like a piece of bamboo rather than a basket (like the Carrack), there is no need for a strong centerline keel. Therefore, there is no need to locate sails on the center line of a vessel. Chinese junks therefore often had staggered masts, arranged in such a way as to take best advantage of the local wind conditions of a particular trade.

Stabilisers

Excessively rapid pitch and roll on a vessel is not only uncomfortable, but also dangerous. Long ago, the Chinese had understood the principle of reduction of the "metacentric height" of a vessel by introducing floodable compartments. In

cases where the boatman requires the vessel to roll less violently from side to side (eg. for fishermen who needs to work standing up on a sampan), he sometimes allowed the forward and after compartment to be flooded. This made the boat relatively less "stable" and therefore reduced the roll of a vessel. In open waters in a following sea,[15] junkmen often open the stern compartment to the sea, so that the stern wave could quickly flood it. This raised the bow of the vessel in an instant, helping it ride out the trough of the wave. Western vessels did not employ the concept of stabilizers[16] until the nineteenth century.

Sails

To the uninitiated, the sail of a junk is often a very sorry sight. It often looks like a patchwork of different kinds of fabric roughly stitched together. Often it is full of holes. However, herein lies its technological brilliance: the sail of a junk can make use of cheap, even scrap, material, whereas western sailing ships must have the entire sail made of good quality and expensive sailcloth.

The secret of the Chinese sail is firstly in the use of battens for stiffening, and secondly in its "balanced lugsail" arrangement. The bamboo battens that are a common feature of junks serve to stiffen the sail, so that it is always more or less flat, and hence aerodynamically efficient. The western sail sometimes bellows in the middle, causing unnecessary turbulence, and reducing its efficiency. This is particularly true when sailing close to the wind.[17] The Chinese sailors were very proud of this close hauling ability of their ships, and said: "The wind has eight directions; the good ship can sail seven."

Most people will notice another feature of the Western sailing ship which is absent in the junk: the shrouds and ratlines. In a

storm, or in port, Western sailors need to climb up to the top of the sails to "reef" or furl up the sail. This is often done in anticipation of a storm, because if the sails are not furled up tight, they may be shredded to bits. This operation is extremely dangerous. Hence, sailors had an expression: "One hand for the ship, the other hand for yourself." They needed the shrouds and ratlines to climb up. Chinese sailors, on the other hand, never had to climb up any sail. In storm or in port, they haul down the entire sail from the deck, which is a much safer operation. On the rare occasions a Chinese sailor needs to climb up the sail (eg. to adjust the weathercock) he uses the sail battens.

Chinese junks are designed to sail close to the wind. This requires tacking, which requires the sails to be switched from one side of the ship to another. This is a relatively easy operation on a junk. In the case of a Western full rigged ship, setting the sail from one side to another involved resetting a huge numbers of individual sails, and often there is not enough time to do it all at once. Hence, square rigged ships cannot tack effectively. Instead, they "wear" — ie. going against the wind in a figure-of-eight pattern. This is extremely inefficient.

Rudder

Until the 12th century AD, rudders were unknown in the West. Like the compass, it was introduced through contacts with Chinese sailors. On the other hand, the stern rudder that we are so familiar with had been used at least from the Han dynasty. Early Western ships steered using a "steering oar" or "steering board". These are ineffective for larger vessels, and require great physical effort to handle. Without the introduction of the stern rudder to Europe, it is unlikely that the great voyages of discovery of Columbus and Diaz could be conducted.

The Chinese had refined the rudder to a very high state of efficiency. Very long ago, they discovered that a rudder that had holes in it made it easier to turn, and yet has no effect on the turning circle of the ship. They developed what is called the "fenestrated" rudder.[18] They also found that a rudder with the rudder stock somewhere near the centre is easier for turning. They developed the "balanced rudder". These features did not appear in the West, until the power and speed of steamships required such great force in turning the rudder that both the fenestrated and balanced rudder were adopted by the Royal Navy torpedo boats in the late nineteenth century.

Propulsion

Besides wind power, Chinese vessels are propelled by several different methods:

- Paddling
- Rowing[19]
- Poling
- Tracking
- Sculling

The various propulsion methods deserve a Paper on their own. The first four are also common in the West. However, the method called "sculling" or "yuloh" (摇橹) is uniquely Chinese. It involves an oar-like device pivoted at the stern of a vessel,[20] held in place with a rope. The boatman pulls the handle backwards and forwards in a rocking action, causing the scull to behave like a fish tail. This propels the vessel forward.

Sculling is not made for speed, but is particularly useful in the Chinese environment, for example, in the busy inland waterways and canals of Jiangnan. A boatman can scull non-stop for a day

and is not fatigued. Located at the rear end of the boat, it leaves the rest available for cargo. It takes up little space on the water except the width of the boat, and therefore can proceed even in very congested waters.

Some of Zheng He's vessels are fitted with these sculls to aid them during port maneuvers and period of calm.[21]

The Compass

The early invention of the magnetic compass by the Chinese is a generally known fact. The first use was in geomancy, and its maritime use probably came in the 9th century. The Chinese also knew about magnetic declination as early as the 11th century. In our study of the sailing directions in the various Pilots' Directories, we have not taken magnetic declination into account. In future studies, this issue should be investigated.

Dead Reckoning[22]

Measuring speed and distance traveled at sea poses many challenges. Account needs to be taken of wind, current and the drift of the ship. It is truly an art instead of a science.

In this area, the Chinese and Western methods are very similar. In both case, the sailor stands at the bow of the ship and throws overboard a small piece of wood. He then walks towards the stern of the vessel at a brisk, standard pace. When he reaches the stern, he observes whether the wood is slower or faster than him, and by how much. If the wood is faster, the ship is said to be "exceeding the watch"; if slower, "short of the watch" (上更/不上更). The sailor then observes the wind, current and drift of the vessel, and mentally corrects the vessel's speed based on his experience against a standard "watch" or "geng".

A "geng" is both a measure of time and a measure of distance. The 24 hour day is divided into 10 "gengs", each "geng" being 2.4 hours. Distances are then quoted as being so many "gengs" apart — of course assuming a standard ship speed. Coincidentally, Chinese sailing ships commonly travels at roughly the speed of a man walking.

In the past, scholars have not studied in detail the effect of ship speed in the pin-pointing of locations. In this paper, a preliminary statistical analysis has been performed to establish the "average" speed of vessels trading in Southeast Asia, thereby eliminating some obviously untenable candidates for Longyamen.

Sounding

Sounding is the taking of water depth. It is important not only from a safety point of view, but also as a navigational aid. When the sailor is not sure of his location, the depth of a place can guide him. Sounding also establishes the nature of the seabed — whether there are corals, sand, mud or stones. The sailor ties a weight (rock or metal) to a rope and coats it with some grease or other sticky substance. He then lowers this until it touch bottom. He then pulls it up, measuring the rope by counting how many times it goes between his two outstretched hands. Each stretch is about 5–6 feet, known as a "tuo" (一托) in Chinese. The depth is thus recorded as being so many "tuos".

It is interesting to note the Western parallel. Depths are measured in "fathoms", each fathom being 6 feet, the distance between the outstretched arms of a European. This shows the universality of the family of seafarers!

Celestial Navigation

The various Chinese Pilots' Directories reveals that for coast navigation, the junkmen relied on sighting of landmarks such

as islands and headlands, assisted by the compass. In the open ocean, however, they relied on the stars.

The use of the Pole Star (北斗星) to establish the latitude of a place was widely used. However, the Chinese also use other stars, such as the Southern Cross (灯笼骨), the three stars on the constellation of the Hunter (参宿三星), alpha & gamma on the Ursa Minor (华益星) etc. The use of multiple stars allows sighting to be made when part of the sky is covered by clouds. Except for the Pole Star, the height of the other stars above the horizon is measured when they transit the meridian.

The altitude of the stars, which relates to the latitude of a location, is measured by a method called "Qian Xing Shu" (牵星术) (loosely translated as "The Art of Star Tethering"). This method is said to be Arabian in origin. It derives from the fact that for most individuals, the angle subtended by a finger set horizontally with the arm outstretched is roughly constant. Hence, the Chinese developed the "digit" (指) as the angular unit of measure for altitudes. Thus, on the Zheng He Navigation Charts, Aden (阿丹－兮亚丁) was recorded as being "5 digits by the Beichen (Pole) Star." This corresponds to Aden's true latitude of 12° 52'.

Zheng He's sailors needed something more accurate than their fingers to establish the stars' altitude. Unlike the European sailors who developed the cross-staff and astrolabe, the Chinese developed "Star Tethering Boards" (牵星板). These are a set of square boards fitted with a silk cord of fixed length. Each board corresponds to a fixed number of "digits". Thus there is a board for 9, 10, 11 digits and so on. To use the board, one end of the cord is placed next to an eye, and the board is held upright with the cord pulled taut. The board is aligned so that the bottom edge sights the horizon and the top edge sights the star. The appropriate star altitude could thus be established through the use of the appropriate board. For measurement of a fraction of a "digit", an additional attachment is held together with the main board to give quarter, half and three quarter "digit" measures.

Ancient "Pilots' Directories"

The "Pilot Directories" are wonderful sources of information about ancient Chinese navigation practices. Not all are scientific. In fact, these pilot books start with instructions for the proper offering of prayers to the numerous deities that need to be appeased for a safe voyage. These include Tian Hou (天后/天妃), Zhou Gong (周公), Lu Ban (鲁班), Guardians of the 24 Directions etc.

Information contained in these directories include: winds, weather, currents, procedure for taking water, measuring speeds, sounding, landmarks, sailing directions, observation of celestial bodies, direction setting through use of paired landmarks, etc. The collection of such information must have been highly organized, and I believe that one of the missions of Zheng He voyages was the collection of such maritime survey information. It is indeed a pity that such information was lost.

Why did Chinese Maritime Technology Lose to the West?

In the days of Zheng He, the state of development of Chinese maritime technology was way ahead of the rest of the world. Why then did it go into decline? This matter is a subject for further extensive study, but some reasons can be put forward to explain this:

- The discontinuity in the development of maritime technology arising from the Ming ban on international voyages arrested its further growth. Valuable skills were lost.

- Chinese shipbuilding methods required the use of some specific material which quickly became scarce. In particular, the giant junks of the Yuan and Ming period required huge masts which were constructed in one piece. This led to the depletion of tall, straight trees in areas of easy access to the shipyards. Eventually, the cost of construction rose exponentially as special timbers need to be transported over greater distances.[23] Large junks became economically unviable, though technically possible.
- Up to the early nineteenth century, Chinese junks could easily compete with European sailing ships for trading. However the coming of steam drastically changed this equation. Because junks sailed with the monsoons, the typical round trip lasted a year. It was a leisurely affair, with much time spent in local waters to collect and distribute local cargoes. Steamships did not have to wait for the wind. They could make half a dozen round trips between China and Southeast Asia within a year. This drastically upset the economics of junk trading.

THE WORK OF MR LIN WO LING

When Mr Lin Wo Ling reawakened the controversy of Longyamen with his publication "Longyamen Reidentified"[24] in 1999, he was already 88 years old. This testifies to his enthusiasm and dedication on this subject.

Mr Lin made a very valuable contribution to the study of this subject. His book is a useful reference to scholars because he used the following methodology:

- He summarized all the major views to date on the subject.
- He put forward clear and strong arguments against views that he considered untenable.

- He supplemented his research of historical records with the study of modern Admiralty Charts and Pilot Books.[25]
- He conducted an on-site survey of his proposed location on a boat.

Thus, his work brings research to another multi-disciplinary level.

Countering Existing Claims

Combining the use of historical records, modern charts and modern Pilot Books, he countered the four views of the location of Longyamen. The following are some of his arguments:

- Against the claim that Longyamen is Keppel Harbour or the Singapore Straits, he pointed to the sailing instructions recorded in the Zheng He Navigation Charts: "From Karimun, sailing for five watches, vessel using 112.5 deg and 120 degree, *reaches*[26] Long Waisted Island (长腰屿), exit Longyamen." He pointed out that from Karimum, taking the bearings 112.5 degrees or 120 degrees will not lead to Singapore but to Batam instead. He also mentioned that the recorded size of Zheng He's Treasure Ship made it too big to sail through this channel.
- Again, against the claim that Longyamen is Keppel Harbour or Singapore Main Straits, he interpreted the distance between Karimum to Longyamen to be 300 Chinese *li* (里). Likewise, from Longyamen to Pedra Blanca, the distance is also 300 Chinese *li*. The total distance of 600 *li* (roughly 200 miles) does not correspond to the actual direct distance between Karimun and Pedra Blanca. Hence, he inferred that the route must have taken a detour around the Riau islands.
- Against the claim that Longyamen is Singapore Main Straits, he argued that from his personal experience and from the report

of Mr C. C. Best (who supported J. V. Mills' view), tidal swirls almost amounting to whirlpools are worrying, and taking account of the strong tides, the anchoring of small vessels along the straits is impossible. Also, he noted that this claim is based on the course from Longyamen to Pedra Blanca being broken up into two sections (75 degrees and 90 degrees). This is not consistent with Chinese practice.

- Against the claim that Longyamen is Johor Lama, Mr Lin questioned Mr Han's view that Johor Lama is related to the Huang Zhi Guo[27] of the Han period, and that Longyamen is related to the ancient kingdom of Langkasuka (凌牙斯加/龙牙犀角). He did not agree with Han's assertion that Longyamen is the gateway to Langkasuka. He also disputed Han's attempt to identify his proposed location through reference to Palembang.
- Against the claim that Longyamen is in the Lingga Straits, he disputed the existence of such a strait. However, he accepted that an alternate Longyamen did exist in this area, and he identified this Longyamen as the southeast cape of Lingga Island. This Longyamen is the one referred to by the Sung and Yuan texts. Another Longyamen (the subject of this Paper) referred to by the Ming and Qing text was at another location, which he identified as Selat Riau.

The present writer agrees with Mr Lin's argument on most points except that which denies the claim that Longyamen is Keppel Harbour.

"Longyamen is at Selat Riau"

Having disputed the existing claims, Mr Lin proposed that Longyamen is at the northern entrance of Selat Riau (between

Batam and Bintan), wile Temasek is at the southern end of the same strait.

His arguments are as follows:

- From the Zheng He Navigation Chart, a bearing of 112.5 degrees from Karimun. This points to the entrance of the Selat Durian.
- He claimed that Long-Waist Island (长腰屿) is Bintan, on account of its shape.
- He disclaimed that Wang Da Yuan's "Dao Yi Zhi Lue[28] account of Temasek and Longyamen pointed to Singapore, but instead it should point to Lingga Peak (龙牙大山) on Lingga Island. Mr Lin felt that Singapore cannot be Wang's 14th century description of Temasek , for he assumed that Singapore was then inhabited by Orang Laut, and had no produce to trade. This assumption is perhaps not born out by archaelogical evidence.
- He chose to reject the commonsensical belief that the most logical route between the South China Sea and the Straits of Malacca (and the western oceans) is through the channel(s) south of Singapore main island. Instead, he chose the roundabout route of going down Selat Durian and up Selat Riau. His explanation is that the Singapore channels are treacherous, while the Riau channels are calm.

REFUTATION OF MR LIN'S PROPOSAL

My Methodology

I am in full agreement with Mr Lin's approach of using a better understanding of ancient and modern navigation knowledge to interpret the historical records. My methodology is therefore similar to Mr Lin's. However, I came to different conclusions:

Counter Arguments

- *Ambiguous Bearings on Ancient Sailing Instructions*: The two most authoritative references to the location of Longyamen can be found in 1) Zheng He Navigation Charts and 2) the Pilots' Directory "Shun Feng Xiang Song — Directions from Guangdong to Malacca'.[29] In both cases, the bearing (or back bearing) taken from Pedra Blanca indicates that Longyamen is Keppel Harbour. Therefore there is no ambiguity between Longyamen and Pedra Blanca. The confusion comes from the bearing between Karimun and Longyamen. This confusion clears when we consider that the Karimun is meant only as a landmark, not a destination (see note 44). The vessel did not reach Karimun, only sail till Karimun is sighted. Combined with the fact that the stretch between Karimun and Longyamen are scattered with numerous islands, it is obvious that this leg is not steered by compass alone. Rather, it is sailed by sight. To support this, I quote the "Shun Feng Xiang Song" which clearly gave the instruction that Longyamen was not be transited at night.[30]
- *Long Waist Island*: In the Zheng He Navigation Chart, the sailor was instructed to sight Long Waist Island before transiting Longyamen (sailing west to east). In "Shun Feng Xiang Song", the sailor was instructed to pass Longyamen and then sail parallel to Long Waist Island. Clearly, if Longyamen is Keppel Harbour, then Long Waist Island must be Singapore mainland. Is this consistent with the facts? The answer is yes. Singapore was referred to as Pulo de Isle Panjang, or Long Island, on a 1755 map by Bellin. From the sea, the Kent Ridge and Faber Ridge with a lower ridge in between fits the description of a "long waist". In contrast, Mr Lin did not offer strong support for his claim that this island was Bintan, which must be key to his argument.
- *Sailing Time Between Karimun via Longyamen to Pedra Blanca*: The total sailing time between Karimun (or more accurately the turning point after the sighting of Karimun) via Longyamen to Pedra Blanca is 10 "watches" or 24 hours, assuming some notional "standard speed" of a 15th century junk. This sailing time is reaffirmed in the "Shun Feng Xiang Song". The question is: how to establish this "standard speed"?

This can be established by statistical analysis of indicated standard sailing time between clearly identified (ie. unambiguous) port pairs derived from the Pilots' Directories. Both "Shun Feng Xiang Song" and "Zhi Nan Zheng Fa" provides many examples of such standard sailing times. Since the distances between these port pairs are known, it is easy to calculate the assumed ship speed. From this analysis (see Appendix), we established that the absolute ship speed (ie. relative to land) is 3.8 knots, and ranges between 2.8 knots to 5.3 knots. With this information, we can combine with the indicated bearings to narrow down the possible location of a place.

Mr Lin Wo Ling proposed that Longyamen is in the north entrance of Selat Riau. According to him, vessels from Malacca to China went pass Karimun, through the Selat Durian, round Pulau Galang in the Riau group, up Selat Riau (passing his proposed site for Temasek), exit the north entrance of Selat Riau towards Pedra Blanca. This represents a total distance of 280 kilometres, or 151 nautical miles. To make this distance in the time indicated in the Pilots' Directories would require the vessel to travel at 6.3 knots — a speed not recorded in the sample of port pairs that I studied. For this routing to be valid, the junk will have to travel at almost twice the average recorded speed. Furthermore, this

U-shaped route will require running, reaching and tacking on a given wind direction. Based on this alone, Mr Lin's proposal cannot be right.

Mr Lin's approach fell short on the following counts:

- Like the many scholars before him, no systematic account has been taken of the ship speeds. They therefore ignored a valuable criterion for cross-checking to limit the range of possibilities. His acceptance of the old standard that one "geng" represents 60 *li*[31] caused him to assume a more lengthy route than the direct one between Karimun and Pedra Blanca.
- Inconsistent reliance on the Pilots' Directories. In his proposal, he added detours and changes in directions in an area filled with waterways and islands. It does not make sense for the Pilots' Directories not to put these changes in if indeed his proposed route was the actual one taken. After all, Pilots' Directories are not spurious pieces of literature, but specific manuals whose strict observance can mean life and death to the sailors. He put complication into an otherwise simple matter.
- Too much emphasis is put on the one ambiguous bearing (Karimun to Longyamen), without considering the possibility that in this sector, due to the number of islands, sailing by sight took precedence over sailing by the compass.
- Over emphasis on the dangers of the Singapore Main Channel in order justify a more circuitous route in "calmer waters". After all, this has become the main channel between East and West for the tens of thousands vessels, large and small, that sail yearly through it.

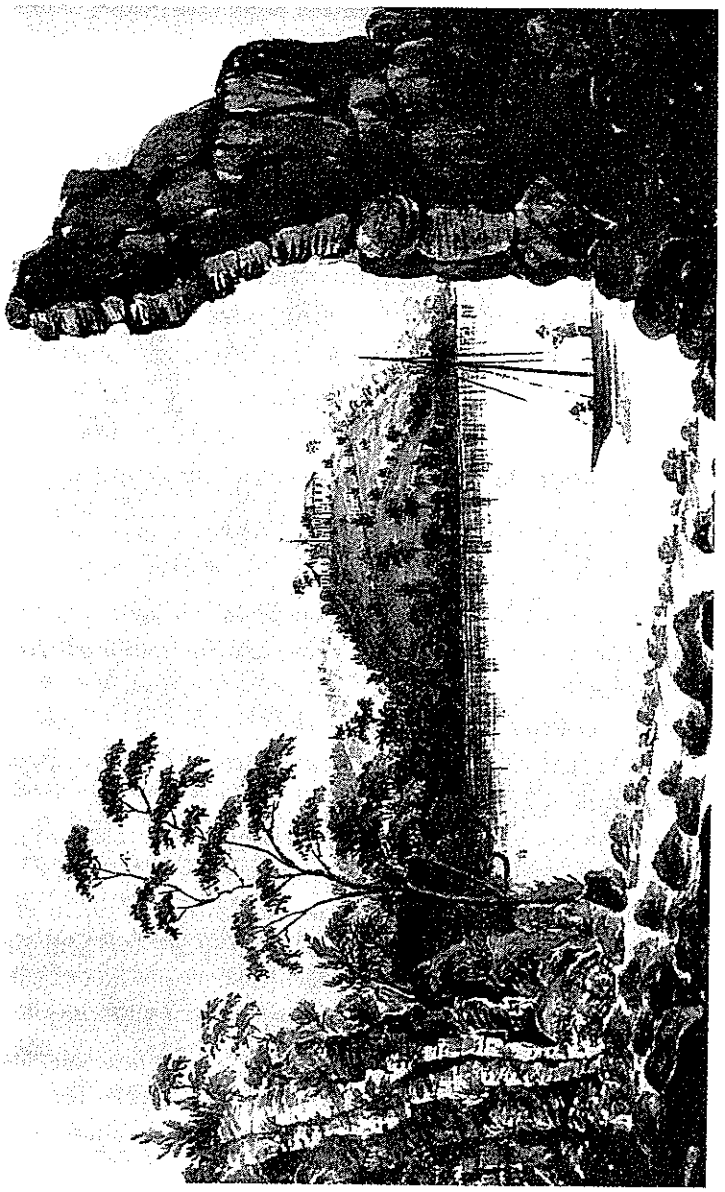

FIGURE 9.1
Long Yamen

Source: The Zheng He Epic, p. 260.

CONCLUSION

This paper does not contest the claim that Lingga Peak/Lingga Island is the other Longyamen (of the Song and Yuan) dynasty. This claim is most probably valid.

We can safely say that the arguments put forward by Mr Lin and others have demolished the claim that Johor Lama was Longyamen.

That Longyamen is Singapore there is no longer any doubt. There is a possibility that the Singapore Main Straits is the Longyamen, but the likelihood is low. Historical description of Longyamen is that of a place. This leaves Keppel Harbour as the most likely. After all, this is the place of the Batu Berlayer (Lot's Wife). This, after all, is the best reason for our claim!

Notes

This paper is based on a talk given on 28 March 2003, organized by Friends of Admiral Zheng He, Singapore and sponsored by Cable Car (Pte.), Singapore.

1. Zheng He, also spelled as Cheng Ho.
2. Gavin Menzies, *1421: The Year China Discovered America*, (New York: William Morrow, 2002).
3. *Sejarah Melayu,* or *Malay Annals*; an annotated translation by C.C. Brown (Kuala Lumpur: Oxford University Press, 1970).
4. Prapantja, *Nagarakretagama* (Djakarta: Siliwangi, 1953); and *The Pararaton: A Study of the Southeast Asian Chronicle* (New Delhi: Sundeep Prakashan, 1996).
5. 林我铃: 《龙牙门新考》, 新加坡南洋学会出版, 1999。
6. W.P. Groeneveldt, *Notes on the Malay Archipelago and Malacca,* compiled from Chinese source (first published in 1876; reappeared in the Dutch Journal in 1880; reprinted in Jakarta: Bahratara, 1960).

7. There is no Straits so named. It is believed that Groeneveldt meant the straits between Lingga Island and Singkep Island.
8. 费信: 《星槎胜览》。冯承钧校注, 北京: 中华书局, 1954。
9. *Chau Ju-Kua, His Work on the Chinese and Arab Trade in the Twelfth and Thirteenth Centuries*, entitled Chu-Fanshi. Translated from the Chinese and annotated by Friedrich Hirth and W.W. Rockhill (New York: Paragon Book Reprint Corp., 1966).
10. 赵汝适: 《诸蕃志》, 冯承钧校注本, 台湾商务印书馆, 1962年版。
11. 张燮: 《东西洋考》之《舟师考·西洋针路》, 谢方点校本, 中华书局, 1981年版。
12. Roland Braddell, "Lung Ya-Men and Tan Ma-His", *Journal of the Malaysian Branch of the Royal Asiatic Society* 42, 1 (July 1969): 10–24.
13. 针经, 如《指南正法》, 《顺风相送》等。
14. Arabian, Indian and Southeast Asian navigation arts were also very advanced, except that I am not competent to comment of these areas.
15. Swells coming from the stern of the junk and overtaking it.
16. Technically known as "flume tanks".
17. Sailing almost against the wind.
18. Fenestrated rudders can still be seen in our Tongkangs.
19. Chinese rowing method is different from the West. Chinese rowers dig their oars almost vertically into the water.
20. In larger vessels they may be positioned on the sides.
21. 罗懋登: 《西洋记》上海: 上海古籍出版社, 1985。
22. The art of measuring distance covered at sea.
23. In contrast, the colonial naval powers such as Portugal, Spain and Britain overcame this by building their ships overseas, where virgin forests can be found. Thus India, the Philippines and America became the place where these powers eventually built their vessels for their subsequent expansion.
24. 《龙牙门新考》, 新加坡南洋学会出版, 1999。

25. He used the "Indonesian Pilot" published by the British Admiralty for much of the information on the appearance of landmarks, winds, currents etc.
26. Mr Lin took the word 取 to mean "going towards" or "reach". A more accurate meaning according to the present writer is "look for" or "sight".
27. 黄支国：《汉书：地理志》。
28. 汪大渊：《岛夷志略·龙牙门条》。
29. 《顺风相送》广东往磨六甲针。
30. 《顺风相送》广东往磨六甲针："夜不可行船，防南边有牛屎礁"。
31. Recent scholars have estimated a vessel traveled 40 *lis* in one "geng".