

The Development of Shipbuilding during the Qing Dynasty

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Introduction

A pervasive view has been that the Manchus, ruling élite of the Qing dynasty (1644–1911), were mainly good at land combat, using their cavalry, not knowing much about naval warfare and warship operations. During the early days, the Qing dynasty had only a few warships. Most of these came from surrendered generals of the Ming dynasty (1368–1644). But the Qing government adapted quickly in spite of its lack of skill in shipbuilding. Soon they learned to use surrendered Han Chinese workmen to build warships to compensate for their own lack of the required skills.

In the third year of Yongzheng 雍正 (1725), one after the other, the coastal provinces established shipyards and began to build warships. A true warship-building industry took shape. Over the years, the Qing manufacture of warships changed correspondingly as opponents changed the types of warships that they were using, but the Qing never designed their own warships. Warships built in Qing yards were never original designs and most were copies of civilian ships. Thus warships and civilian ships were of more or less the same design during the Qing.

Given this reality, Qing rulers did not devote much effort to improving their warships in design and construction. As a result the quality of Qing warships was inferior to the quality of contemporary civilian ships. Qing had to continue requisitioning civilian ships during wartime to make up for the inadequacies of naval ships.¹

The development of a civil shipbuilding industry was similarly hindered by the Qing maritime prohibition policy (*haijin zhengce* 海禁政策). It was also limited by the demands of the official tribute trade system (*chaogong maoyi* 朝貢貿易).²

1 *Guangdong haifang huilan* 12.52a.

2 Gu Hongting 2002, 21.

That Qing warship building technology did not improve very much reflected the weakness of its opponents. Weak opponents actually allowed the Qing navy to achieve a certain amount of success, when fighting against pirates for example.

Fleet organization as well as the location of shipyards also had important influence on effectiveness. Figure 1 below shows where the Qing shipyards were located.



Fig. 1 The Locations of Qing Shipyards in the Coastal Provinces of Zhejiang, Fujian and Guangdong

The Qing navy was successful in dealing with the threat of pirates through its efficient sailing tactics and swift dispatch of appropriately-mixed forces of war vessels. Nonetheless, Qing warships proved vulnerable when confronted with modern Western steam-powered vessels.

Shipyards

Each coastal province established shipyards to repair and build warships. Shipyards were concentrated in Southeast China, that is, most were found in Zhejiang, Fujian and Guangdong provinces. Fujian had the most shipyards (tab. 1).



Fig. 2 Locations of Units in Shipyards in Zhejiang, Fujian and Guangdong Provinces

Tab. 1 Shipyards in Zhejiang, Fujian and Guangdong Provinces³

| Province | Shipyards | Assigned Navy Units | Supervisors |
|----------|--|---|--|
| Zhejiang | Ningbo shipyard (<i>Ningbo chang</i> 寧波廠) | Dinghai brigade (<i>Dinghai zhenbiao</i> 定海鎮標), Xiangshan regiment (<i>Xiangshan xie</i> 象山協), Wenzhou brigade (<i>Hangzhou xie</i> 杭州協) | circuit intendant of Ningbo, Shaoxing and Taizhou prefectures (<i>Ningshaotai daotai</i> 寧紹台道臺) |
| | Wenzhou shipyard (<i>Wenzhou chang</i> 溫州廠) | Wenzhou brigade (<i>Wenzhou zhenbiao</i> 溫州鎮標) | Wenzhou circuit intendant (<i>Wenzhou daotai</i> 溫州道臺) |

3 Official titles in this paper are mainly translated according to Hucker 1985.

| Province | Shipyards | Assigned Navy Units | Supervisors |
|-----------|---|--|--|
| Fujian | Fuzhou shipyard (<i>Fuzhou chang</i> 福州廠) | (Min'an regiment) <i>Min'an xie</i> 閩安協, Funing brigade (<i>Funing zhenbiao</i> 福寧鎮標), Haitan brigade (<i>Haitan</i> <i>zhenbiao</i> 海壇鎮標) | “grain and post” circuit intendant (<i>liangyi daotai</i> 糧驛道臺) |
| | Zhangzhou shipyard (<i>Zhangzhou chang</i> 漳州廠) | Nan'ao brigade (<i>Nan'ao</i> <i>zhenbiao</i> 南澳鎮標), right battalion of Jinmen brigade (<i>Jinmen zhen youying</i> 金門鎮右營) | Tingzhanglong circuit intendants (<i>Tingzhanglong daotai</i> 汀漳龍道 臺 of the Tingzhou, Zhangzhou prefecture and directly adminis- tered department of Longyan) |
| | shipyard of the Taiwan circuit (<i>jungong dao</i> <i>chang</i> 軍工道廠) | Taiwan brigade (<i>Taiwan</i> <i>zhenbiao</i> 臺灣鎮標), Penghu regiment (<i>Penghu xie</i> 澎湖協) | Taiwan circuit intendant (<i>Taiwan daotai</i> 臺灣道臺) |
| | shipyard of the Taiwan prefec- ture (<i>jungong fu</i> <i>chang</i> 軍工府廠) | military shipyard of the Taiwan prefecture (<i>jungong fu chang</i>) | Taiwan prefect (<i>Taiwan zhifu</i> 臺灣知府) |
| | Quanzhou ship- yard (<i>Quanzhou</i> <i>chang</i> 泉州廠) | left battalion of Jinmen brigade (<i>Jinmen zhen zuoying</i> 金門鎮左營), right battalion of Haitan brigade (<i>Haitan</i> <i>zhen youying</i> 海壇鎮右營) | Xingquanyong circuit intendants (<i>Xingquanyong daotai</i> 興泉永道 臺 of Xinghua, Quanzhou and Yongchun prefectures) |
| Guangdong | Henan shipyard (<i>Henan chang</i> 河南廠) ⁴ | Dongguan regiment (<i>Dongguan xie</i> 東莞協) | salt distribution commissioner (<i>yanyun shi</i> 鹽運使) |
| | Anbu shipyard (<i>Anbu chang</i> 庵埠廠) | <i>Chaozhou zhenbiao</i> (Chao- zhou brigade 潮州鎮標), Na'nao brigade (<i>Nan'ao</i> <i>zhenbiao</i> 南澳鎮標) | “grain and post” circuit intendant (<i>liangyi daotai</i> 糧驛道臺) |
| | Zhiliao shipyard (<i>Zhiliao chang</i> 芷苧廠) | Longmen regiment (<i>Longmen xie</i> 龍門協) | Gaolian circuit intendant (<i>Gao-</i> <i>Lian daotai</i> 高廉道臺, circuit intendant of Gaozhou and Lian- zhou) |
| | <i>Longmen chang</i> 龍門廠 (Long- men shipyard) | Longmen regiment (<i>Longmen xie</i> 龍門協) | Qinzhou magistrate (<i>Qinzhou zhizhou</i> 欽州知州) |
| | <i>Haikou chang</i> 海口廠 (Haikou shipyard) | Haikou regiment (<i>Haikou xie</i> 海口協) | Qiongzhou prefect (<i>Qiongzhou zhifu</i> 瓊州知府) |

4 I. e. Henan town in southern Guangdong.

Zhejiang Province

Before the shipyards were established, the system for Qing warship construction was disorganized and chaotic. Resulting were inadequate numbers of warships and corrupt governors. The Liangjiang governor-general (*Liangjiang zongdu* 兩江總督, governor-general of the two Yangzi provinces and surrounding areas) Heshou 赫壽 (1712–1717), wrote:

The ports of Guangdong province are the main areas for grain transport. But the warships there are seriously damaged and cannot be used anymore; therefore we have to hire civilian ships instead. I am afraid that this may cause delay.⁵

During the Kangxi 康熙 reign (1662–1722), the government began to pay more attention to warship construction, but discussions were protracted and inconclusive. At that time, numbers of naval warships were inadequate. The government had no choice but to requisition civilian ships. This situation continued until the early years of the Yongzheng period (1723–1735).

After the Yongzheng Emperor ascended the throne, he advanced various reforms. The warship-building system was one object. In 1725 the Liangjiang governor-general Zhabina 查弼納 (1722–1726) suggested:

We should set up shipyards in areas with access to rivers, lakes, and in various places where goods can be concentrated. It will be easier to find workers in such cases. We could appoint a circuit intendant-official in charge of the circuit (*daotai* 道臺) to supervise every year, and appoint regional vice commanders (*fujian* 副將), or assistant regional commander (*canjiang* 參將), to oversee the entire system.⁶

This suggestion was adopted. The government began to set up shipyards in the coastal provinces in accordance with their respective demands for warships.

The Zhejiang provincial government set up shipyards in Ningbo and Wenzhou. Warships of the Dinghai brigade (*Dinghai zhenbiao* 定海鎮標) and patrol ships of the Xiangshan regiment (*Xiangshan xie* 象山協) and the Hangzhou regiment (*Hangzhou xie* 杭州協) were constructed by the Ningbo shipyard (*Ningbo chang* 寧波廠). Warships of the Wenzhou brigade (*Wenzhou zhenbiao* 溫州鎮標) were constructed by the Wenzhou shipyard (*Wenzhou chang* 溫州廠). The shipyards' construction was under the control of the Ningshaotai circuit intendant (*Ningshaotai daotai* 寧紹台道臺) and the Wenzhou circuit in-

5 *Shengzu Ren huangdi shilu* 255.527: 廣東省運米，疏稱京口戰船今係大修之年，俱各修理，不堪應用。請雇民船運米等語。沿海各省，設立戰船者，特為防護地方，裨益民生、以備急需也。

6 *Taiwan zhibi* 2.64: 雍正三年，兩江總督查弼納題准設立總廠於通達江湖百貨聚集之所，鳩工辦料，較為省便；歲派道員監督，再派副將或參將一員同監視焉。

tendant (*Wenzhou daotai* 溫州道臺). Officers chosen by the regional vice commanders and assistant regional commanders would be responsible for oversight.⁷ In 1728 the government issued a decree: each shipyard should deliver warships to the governor-general for inspection when completed. Although the shipyards were governed by fixed regulations, there were still problems with corruption. To prevent this, the government approved the following in 1793:

If anybody is involved in illegal activities or is receiving monopoly profits, they and the officials responsible for undertaking repairs (*chengxiu guan* 承修官) and the officials involved in the illegal activities or monopoly profits should be dismissed. And according to the new law, the responsible inspector should be downgraded three levels and transferred; the responsible *dufu* 督撫 (governor-generals and governors) by one level and transferred.⁸

Although Zhejiang province had two shipyards, and there were keel factories in Wenzhou prefecture (*Wenzhou fu* 溫州府),⁹ Fujian had the richest resources in keel lumber and in skilled shipbuilding labour and technology. Zhejiang thus often commissioned Fujian shipyards to manufacture its warships, in 1726 and 1784, for example. Thus, each province not only built ships of their own, but could also take orders from other shipyards.¹⁰

Fujian Province

In 1725, the Fujian government established shipyards in Fuzhou and Zhangzhou. Construction output from the Fuzhou shipyard was shared between two circuit intendants, “grain and post” circuit intendant (*liangyi daotai* 糧驛道臺) and Xingquanyong circuit intendants (*Xingquanyong daotai* 興泉永道臺), who oversaw the area’s courts, law enforcement, civic defense, canals, and customs collection. The Zhangzhou shipyard was established by the office of the Tingzhanglong circuit intendant (*Tingzhanglong daotai* 汀漳龍道臺).¹¹ The shipyards’ workers were commissioned by regional vice commanders (*fujian* 副將) and by assistant regional commanders (*canjiang* 參將). The Taiwan and Penghu regiments established shipyards in Taiwan under the control of the Taiwan circuit intendant (*Taiwan daotai* 臺灣道臺) and Taiwan regional vice

7 *Guangxu huidian shili* 936.315-316.

8 *Qianlong huidian zeli* 23.280: 水師修造戰船，如有不肖營員希圖射利、包修者，將承修官與該營將官皆革職，督修官照徇庇例，降三級調用，督撫降一級調用。

9 *Gongzhong dang Yongzheng chao zouzhe*, vol. 5, 655.

10 Li Qilin 2013, 17.

11 *Guangxu huidian shili* 936.316.

commanders (*Taixie fujiang* 臺協副將). The civil officials were commissioned by the Taiwan circuit intendant while the military officials were commissioned by the Taiwan regional vice commanders. Fujian now had what became standard shipyards, the first of their kind established during the Qing dynasty.

The early development of sea transportation there meant that Fujian shipbuilding carried on a long tradition. Early in the Song dynasty (960–1279), there was a saying: “The best seagoing vessels are from Fujian.”¹² During that time, Zhangzhou, Quanzhou, Fuzhou, and Xinghua, the so-called four great shipbuilding bases, could already build huge ships more than 30 metres in length.¹³ In the fifth year of Hongwu 洪武 (1372), the government ordered Zhejiang and Fujian to construct 660 ships as well as so-called *duolu kuaichuan* 多櫓快船 (lit.: many-oared fast boats) to overpower Japanese pirates.¹⁴

In 1725 the governor-general of Fujian and Zhejiang (*Min Zhe zongdu* 閩浙總督), Gioro Manbō 覺羅滿保 (1673–1725), suggested establishment of shipyards in Fuzhou, Zhangzhou and Taiwan and the appointment of a high official to supervise them. His palace memorial reads as follows:

Both Fuzhou and Zhangzhou prefectures, located in estuaries have been all important ports for commercial cargos. Taiwan prefecture should have its own shipyards as Taiwan is located far across the ocean.¹⁵

The Quanzhou shipyard was established in 1729 (the seventh year of Yongzheng), but its workers had to be transferred from Fuzhou by Quanzhou prefecture. To make up for the deficiency in personnel, the governor-general of Fujian and Zhejiang Gao Qizhuo 高其倬 (1676–1738), assigned 53 warships from Jinmen and Haitan to the new Quanzhou shipyard. The circuit intendants of Xinghua, Quanzhou and Yongchun prefectures were overseers.¹⁶ After the Quanzhou shipyard had been established, the warship quotas of other shipyards were changed accordingly.

Quanzhou shipyard received the 53 warships transferred from the Fuzhou shipyards but because Zhangzhou and Quanzhou shipyard manufacturing were not on a par, the Qing government also transferred the Zhangzhou shipyard commander-in-chief (*shuishih tibiao* 水師提標) and the 26 warships of the

12 *Zhongmu ji* 2.14.

13 *Zhangzhou jiaotong zhi*, 241.

14 *Fujian tongzhi* 4.1686.

15 *Ming Qing shiliao* 7, 614-615: 福州府、漳州府二處地方俱通海口，百貨雲集，應於此二處設立一廠，臺灣水師等營戰船，遠隔重洋，應於臺灣府設廠。

16 *Xiamen zhi* 5.153.

middle and right anchorages to Quanzhou shipyard in 1736. Thus, Quanzhou shipyard became responsible for a total of 79 warships.¹⁷ After the Qianlong 乾隆 period (1736–1796), the assignment of the Zhangzhou shipyard remained only 73 warships, and Taiwan shipyard was also reduced from 98 to 96. At the same time, government established a Quanzhou shipyard branch in Xiamen, hence Quanzhou had two shipyards as a result (cf. tab. 2-4).

Tab. 2 Warships of Fujian in 1725¹⁸

| Shipyards | Total Warships | Assigned Navy Units | Supervisors | Overseers |
|---|----------------|---|---|---|
| Fuzhou shipyard (<i>Fuzhou chang</i>) | 133 | Haitan brigade (<i>Haitan zhenbiao</i>) | Liangyi circuit intendant, Xingquanyong circuit intendants | regional vice commander (<i>fujian</i> 副將), assistant regional commander (<i>canjiang</i> 參將) |
| Zhangzhou shipyard (<i>Zhangzhou chang</i>) | 101 | Fujian navy provincial command (<i>Fujian shuisbi tibiao</i> 福建水師提標) | Tingzhanglong circuit intendants | regional vice commander, assistant regional commander |
| shipyard of the Taiwan circuit (<i>junong dao chang</i>) | 98 | Taiwan navy regiment (<i>Taiwan shuisbi xiebiao</i> 臺灣水師協標) | Taiwan circuit intendant | regional vice commander |

Tab. 3 Warships of Fujian in 1729¹⁹

| Shipyards | Total Warships | Assigned Navy Units | Supervisors | Overseers |
|---|----------------|-----------------------------------|---|---|
| Fuzhou shipyard (<i>Fuzhou chang</i>) | 80 | Haitan brigade | Liangyi circuit intendant, Xingquanyong circuit intendants | regional vice commander (<i>fujian</i>), assistant regional commander (<i>canjiang</i>) |
| Zhangzhou shipyard (<i>Zhangzhou chang</i>) | 101 | Fujian navy provincial command | Tingzhanglong circuit intendants | regional vice commander, assistant regional commander |
| shipyard of the Taiwan circuit (<i>junong dao chang</i>) | 98 | Taiwan naval regiment | Taiwan circuit intendant | regional vice commander |
| Quanzhou shipyard (<i>Quanzhou chang</i>) | 53 | Jinmen brigade, Haitan brigade | Xingquanyong circuit intendants | major (<i>youji</i> 遊擊) |

17 *Guangxu huidian shili* 936.319.

18 Source: *Xiamen zhi*, 153.

19 Source: *Xiamen zhi*, 153; *Jiaqing huidian shili* 707.5a.

Tab. 4 Warships of Fujian in 1736²⁰

| Shipyards | Total Warships | Assigned Navy Units | Supervisors | Overseers |
|---|----------------|-----------------------------------|--|---|
| Fuzhou shipyard (<i>Fuzhou chang</i> 福州廠) | 76 | Haitan brigade | salt control circuit (<i>Yanfa dao</i> 鹽法道) | regional vice commander, assistant regional commander |
| Zhangzhou shipyard (<i>Zhangzhou chang</i> 漳州廠) | 73 | Zhangzhou navy provincial command | Tingzhanglong circuit intendants | regional vice commander, assistant regional commander |
| shipyard of the Taiwan circuit (<i>jungong dao chang</i>) | 96 | Taiwan naval regiment | Taiwan circuit intendant | regional vice commander |
| Quanzhou shipyard (<i>Quanzhou chang</i>) | 79 | Jinmen brigade, Haitan brigade | Xingquanyong circuit intendants | major |

The Taiwan shipyard was established in Tainan (fig. 3) and its importance was no less than that of the three shipyards of Fujian. It constructed 105 warships and became the largest shipyard of all.²¹ At one time, Taiwan had three shipyards. The Taiwan circuit intendant was established (cf. tab. 6.17) in 1727. But after it silted up, shipbuilding became difficult there, and orders could not be completed on time. At the suggestion of Sun Erzhun 孫爾準 (1772–1832), the shipyard of Taiwan prefecture (*Taiwan fu*) was established in the 5th year of Daoguang 道光 (1825). The Taiwan prefecture shipyard was a temporary one. Its mission was to build the ship that Taiwan circuit intendant shipyard could not finish. After these ships had been completed, it would be discontinued. In 1863 (the 2nd year of Tongzhi 同治, 1862–1875), in accordance with the suggestion of Taiwan circuit intendant Ding Yuejian 丁曰健, a new Taiwan circuit intendant shipyard was established to replace the old one.²² After the Fuzhou ship council (*Fuzhou chuanzhengju* 福州船政局) was founded in the fifth year of Tongzhi (1866), Taiwan nearly ceased shipyard operations. But in sum, the Qing government in the end established a total of three shipyards in Taiwan.

20 Source: *Jiaqing huidian shili* 707.10b.

21 *Ming Qing shiliao* 8, 773.

22 Li Qilin 2013, 40–46.

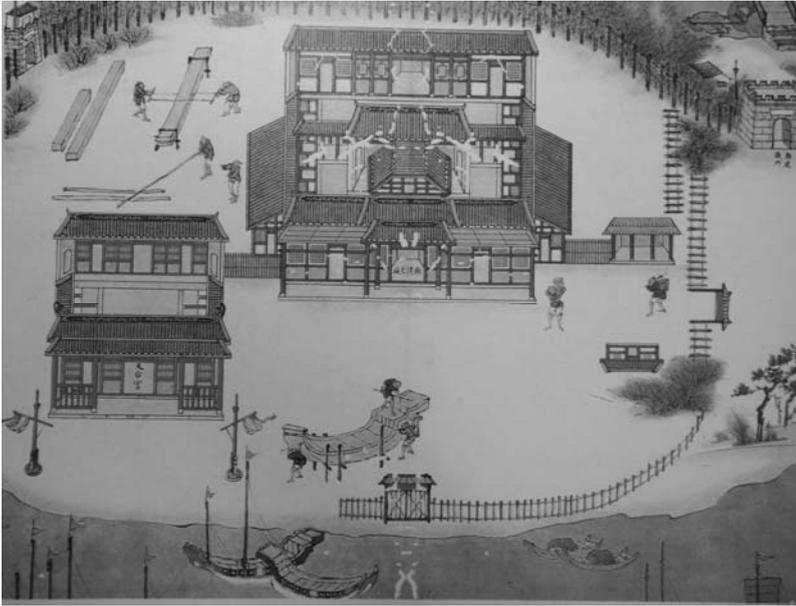


Fig. 3 Taiwan Circuit Shipyard (1778)²³

Guangdong Province

Before the establishment of its shipyards, Guangdong province had already begun building warships like other provinces. In the seventeenth year of Kangxi (1678), Guangzhou prefecture had built 20 “bird boats” (*niaochuan* 鳥船), around 50 “pursuers” (*ganzeng chuan* 趕繒船) and 30 “watercrafts” (*juchuan* 艍船).²⁴ In 1725, Guangdong province established four shipyards. The one established in Henan, at Quanzhou, served warships belonging to Guangzhou, Huizhou and Zhaoqing prefectures. The one in Anbu was responsible for the warships of Chaozhou. The one in Zhiliao was responsible for the warships of Gaozhou, Leizhou, and Lianzhou, and the one in Haikou for the warships of Qiongzhou. These four shipyards were supervised by circuit intendants (*daotai* 道臺), and military affairs were managed by regional vice commanders (*fujian* 副將), majors (*youji* 游擊), or captains (*shoubei* 守備).²⁵ In 1737, because of the

23 Source: *Chongxiu Taijun ge jianzhu tushuo*, 42. The Taiwan *dao* shipyard was located in the vicinity of today's Liren Elementary School in Tainan (Tainan shi Liren guoxiao 臺南市立人國小), Taiwan.

24 *Pingmin ji* 5.134.

25 *Guangxu huidian shili* 936.316.

shortage of wooden materials in Gaozhou, another shipyard was established at Longmen. The Longmen shipyard was to build warships for the Longmen regiment. The Qinzhou magistrate (*Qinzhou zhizhou* 欽州知州) was responsible for the construction, and the Gaozhou brigade (*Gaozhou zhen*) in charge of inspections.²⁶

Although Guangdong province had established five shipyards, some of them had to be shifted to other places due to shortages of lumber. For example, the Zheliao shipyard in Gaozhou had a sub-factory, but it had not built any ships even after twenty years of operation. The ships built by the Longmen shipyard were likewise few and far between. In order to solve such problems of ship shortage, in the eighth year of the Qianlong reign (1743) a new shipyard was constructed in Henan, at Guangzhou, to replace the Zhiliao shipyard.²⁷ Gaozhou and Leizhou officials were to be commissioned to supervise construction. Review and budgeting would be carried out by the circuit intendants (*daoyuan*). As construction of the new shipyard went forward, the Longmen sub-shipyard would remain as before. In addition, after establishing the new shipyard in Guangzhou, the “grain and post” circuit intendant (*liangyi daotai*) became the supervisor due to the changing of the location. In addition, supervision over the “oared and paddled boats” (*luxiang chuan* 櫓槳船) was assigned to Gaozhou dao circuit intendant and Leizhou circuit intendant on a fifty-fifty basis.²⁸

In 1752, most warships in Guangdong province were damaged; hence assignments to yard work were rearranged. The government approved the following:

The ocean-going shipbuilding of both Gaozhou and Leizhou in Guangdong province has become vulnerable since shipbuilding had been transferred from Zhiliao to Henan. Those ships have mostly suffered damage from strong winds while sailing in rough seas. The repairment of the warships of the Hai'an battalion (Hai'an ying 海安營) and the right battalion of Leizhou brigade (*Leizhou xie youying* 雷州協右營) should be realigned to the Haikou shipyard of Qiongzhou while those of Wuchuan 吳川, Dianbai 電白, and Naozhou 碓洲 should be realigned to the Zheliao shipyard in Gaozhou.²⁹

26 *Guangxu huidian shili* 936.319.

27 *Shengzu Ren huangdi shilu* 196.520.

28 *Guangxu huidian shili* 936.321.

29 *Guangxu huidian shili* 937.745. 廣東省高雷二府屬外海戰船。自改歸省城河南地方修造。緣屆修之船。已不堅固。遠涉重洋。多遭風擊碎。應將海安營、雷州協右營戰船大小修。歸瓊州之海口廠。吳川、電白、碓洲、三營戰船大小修。歸高州之芷芷廠。

Although there were five shipyards in Guangdong province, the building of warships could not be completed in time. Therefore, they had to be flexible in terms of the distribution of shipbuilding and support each other. This quotation ends with the thirty third year of Guangxu 光緒 (1908).

The Types of Warships

The Qing dynasty used various types of warships inherited from the Ming dynasty. During the Shunzhi period 順治 (1644–1661), warships were classified by styles and sizes, e.g. as small “water craft” (*shuiju chuan* 水艭船), “spiked boats” (*lizeng* 犁繒; literally “plow fishnets”, a type of spiked boat), sand boats (*sha chuan* 沙船), “bird boats” (*niaochuan* 鳥船), “fire boats” (*paochuan* 砲船 or 礮船, literally cannon boats), “patrol boats” (*shaochuan* 哨船) and “flat boats” (*yichuan* 戈船).³⁰ By function, there were two kinds of warships: those for fighting and those for patrol. The battleships were sailed by the navy, and the patrol ships were controlled by the sub-prefectures (*zhou* 州), county (*xian* 縣), and prefecture (*fu* 府) officials. There were no specifically naval patrol ships in the Qing dynasty.

After the Qing dynasty took control, it continued the traditions of Ming shipbuilding, mainly in Fujian and Guangdong ship styles, such as bird boats (*niaochuan* 鳥船), pursuers (*ganzeng chuan* 趕繒船), and watercrafts (*juchuan* 舡船). These kinds of ships were all originally civilian and merchant ships, and fishing boats. In other words, the Qing government procured their warships by remodelling various kinds of civilian ships. Civilian shipbuilding technologies were of high standard, but further improvement in them was limited due to the restrictions placed on shipbuilding by the government.³¹

In the thirteenth year of Shunzhi (1656), Fujian established a navy with 3,000 serving crews and hundreds of *huchuan* 唬船 (also known as *balabu chuan* 叭喇唬船; the name comes from the Chinese transcription of Malay word for sailing vessels, *perahu*) (fig. 4), patrol boats, pursuers, and *shuanpeng chuan* 雙篷船 (double matted sail boats).³² The different types of ships varied in size. In the twenty ninth year of Kangxi (1690), there was a regulation for

30 *Yongzheng huidian* 209.13898.

31 Liu Xufeng 2005, 338.

32 *Qingshi gao* 135.4014.

building warships used for patrol.³³ In any case, according to the *Qingshi gao* 清史稿: “Fujian had many types of warships, just like Zhejiang and Guandong.”³⁴

The warships built by the three provinces of Zhejiang, Fujian and Guangdong were mainly pursuers and small watercrafts (*juchuan*). Warships of these two kinds were large and became the main warships prior to the Jiaqing 嘉慶 reign (1796–1821). When the pirate problem became more serious after the Jiaqing reign, the government built the more mobile Tong’an ships in order to fight the pirates. These in turn became the main warships during the Jiaqing and Daoguang reigns. Nearly all the warships destroyed by the British Royal navy during the Opium War were of these two types.



Fig. 4 *Balabu chuan* 叭喇唬船³⁵

Following are the various types of the warships in use:

Pursuers

Pursuers (*ganzeng chuan* 趕繒船), as depicted in *Minsheng shuishi ge biao zhen xieying zhanshao chuan zhi tushuo* 閩省水師各標鎮協營戰哨船隻圖說 (“Illustra-

33 *Fujian sheng waihai zhanchuan zeli* 1.1a.

34 *Qingshi gao* 135.4014.

35 Also known as *buchuan*. Source: *Wubei zhi* 117.1b.

tions of the ships of Fujian province's naval bases", fig. 5), were originally civilian fishing boats. In the twenty seventh year of Kangxi (1688), ships of this type became the main warships.³⁶ Pursuers usually had two sails. They had other key features: high bulwarks, broad hulls, tall battens, and round bottoms. This type of ship could sail very fast and navigate the open seas. There were three types of pursuers: large, medium, and small. The large one had an amount of 80 and 42 guns, the medium size of 60 and 30 guns, and the small one of 50 and 25 guns.³⁷

The largest pursuer was 29 metres in length, and the second largest was 23 metres long.³⁸ Huge pursuers could be used for "ploughing attack, collision combat" (*lichong* 犁衝). Other details can be found in the *Gazetteer of Jinmen*.³⁹

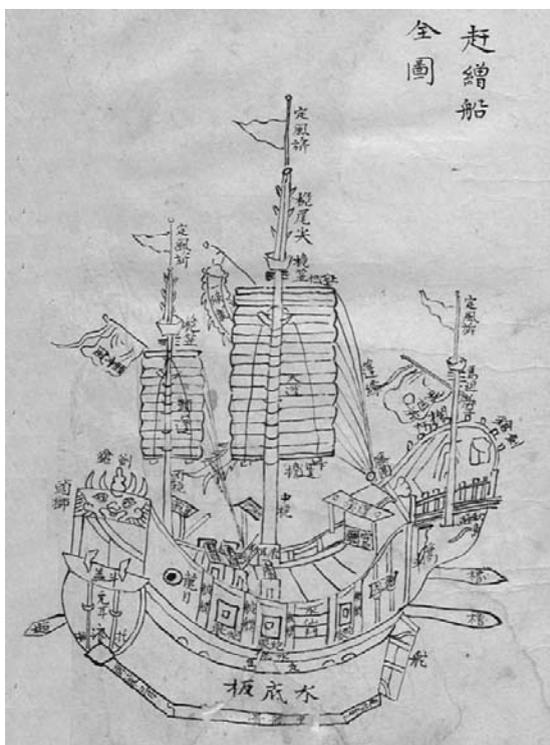


Fig. 5 Ganzengchuan 趕繒船⁴⁰

36 *Minsheng shuishige biaozhen xieying zhanshao chuan zhi tushuo*, 12v.

37 *Guangxu huidian shili* 710.835-836.

38 *Guangxu huidian shili* 936.316.

39 *Jinmen zhi* 5.95.

40 Source: *Minsheng shuishige biaozhen xieying zhanshao chuan zhi tushuo*, 12r.

The pursuer was not only a warship, but was also often used for ocean-going voyages by civilians. Such ships carried passengers and traded with the Philippines (Luzon, Lūsōng 呂宋). Pursuers were thus used for battle, commerce and fishing.⁴¹

Watercrafts

Watercrafts (*juchuan* 舢舨, *shuangpeng chuan* 雙篷船, fig. 6) were smaller than pursuers, but the shapes of the two types of warships were very much alike and it was hard to distinguish between them. Watercraft had a slightly lower bow and lacked the pursuer's lion's head carving at the bow.⁴² The stem was high.

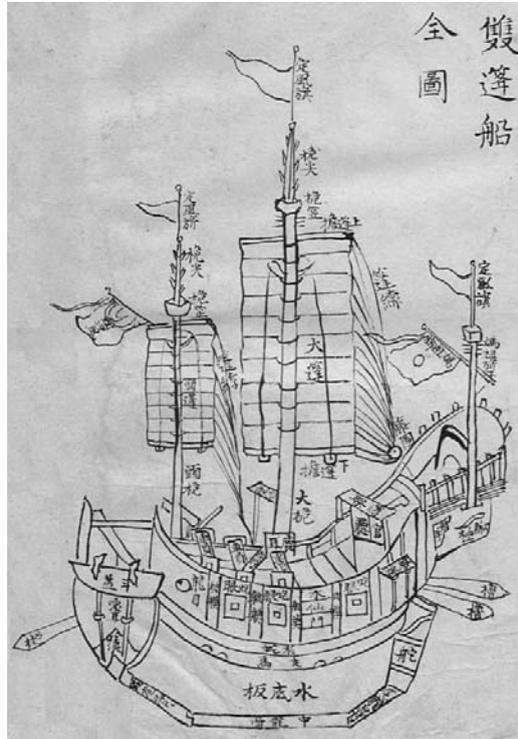


Fig. 6 *Shuangpeng chuan* 雙篷船⁴³

41 Liao Dake, 2002, 296.

42 *Minsheng shuishi ge biaozen xieying zhanshao chuan zhi tushuo*, 13v.

43 Also known as *juchuan*. Source: *Minsheng shuishi ge biaozen xieying zhanshao chuan zhi tushuo*, 13r.

It entered navy service after 1688.⁴⁴ A white bottom was a distinguishing feature of the watercraft, so the ship was sometimes called *baidi juchuan* 白底艍船 (literally white-bottom *juchuan* boat); also *shui juchuan* 水艍船 (literally “water” *juchuan*, meaning, in this case, small *juchuan*). *Juchuan* are usually illustrated with double matted sails, and were also called *shuangpeng juchuan* 雙篷艍船 (double matted sail *juchuan*).⁴⁵ Pursuers and *Juchuan* were both originally varieties of civilian fishing boats. For this reason, they were similar, and the Qing government and common people sometimes referred to the ships together as *zeng juchuan* 繒艍船, meaning “pursuer and watercraft”.

Juchuan were found in several sizes. The small-sized watercraft could carry 21 people.⁴⁶ The medium-sized could carry 30 people. The Guangzhou general, Xiteku 錫特庫 (?–1666), suggested sending a type of medium-sized watercraft with a crew of 30 people to Humen 虎門, in Dongguan county in Guangdong province.⁴⁷ Watercrafts were also a kind of v-bottom ship and could navigate the ocean seas; thus it could be used to carry rice, and regularly voyaged between Taiwan and Fujian.⁴⁸ Zhejiang and Guangdong also had watercrafts, and the importance of this type was no less than that of the pursuer.

Tong’an Ships

Tong’an ships (*Tong’an chuan* 同安船, fig. 7) were merchant ships used in Tong’an, Fujian. These types of ships gradually replaced the pursuers and became the main warships of the Qing dynasty due to their good sailing qualities. Later, Zhejiang and Guangdong also began to use Tong’an ships. In 1805 (10th year of the Jiaqing reign), the pursuers in Taiwan were replaced by Tong’an ships. To confirm that Tong’an ship operations were superior to those of pursuers, in 1806 (11th year of Jiaqing reign), before wide-spread construction was undertaken, the governor-general of Zhili (Zhili *zongdu* 直隸總督), Wen Chenghui 溫承惠 (1754–1832), asked the provincial military commander of Zhejiang (Zhejiang *tidu* 浙江提督), Li Changgeng 李長庚 (1752–1807), and other related officials, about their use. They responded that the Tong’an ships were just as stable as commercial transport ships.⁴⁹ This shows that Tong’an ships were approved of by officials.

44 *Shengzu Renhuangdi shilu* 79.247.

45 *Shengzu Ren huangdi shilu* 79.247.

46 *Guangdong baifang huilan* 15.5b.

47 *Shengzu Ren huangdi Shilu* 462.996-997.

48 *Gaozong Chun huangdi shilu* 1357.188-189.

49 *Renzong Rui huangdi shilu* 161.87.

The redesigned Tong'an ships carried armaments vastly more powerful. *Ji* 集 and *cheng* 成 types were the first level of Tong'an ships and were relatively larger in size. The *ji* type could carry a crew of 50; the no. 1 subtype, according to the (*Qinding Junqi zeli* 欽定軍器則例 (Imperially Endorsed Regulations and Precedents on Weapons), could carry a crew of 30-40. Other levels carried fewer crew members.⁵⁰

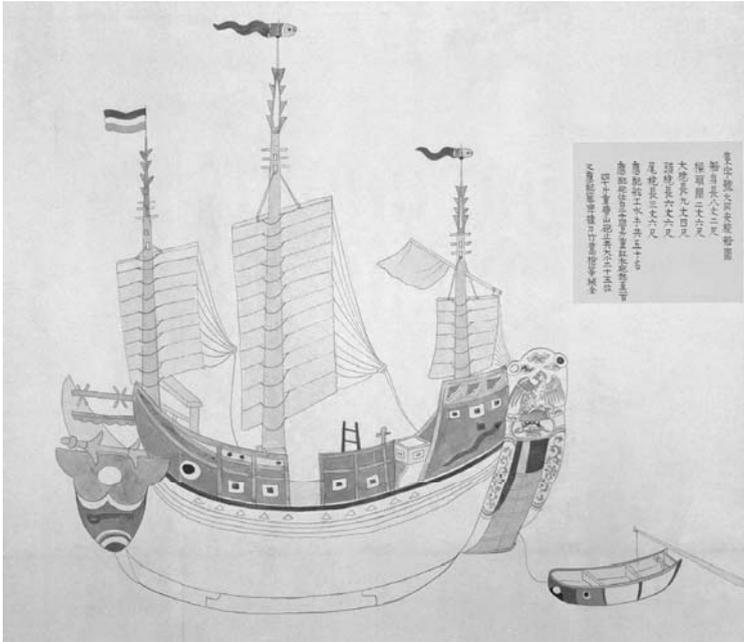


Fig.7 *Ji* Type Tong'an Ship⁵¹

The redesigned Tong'an ships carried armaments vastly more powerful. The *ji* type (fig. 7) was equipped with two 2,000 *jin* 觔 (1,180 kg) *hongyi pao* 紅夷礮 or 紅夷礮 (lit.: “red coating cannon” or “red barbarian cannon”, fig. 8), four pieces of 1,500 *jin* (885 kg) *hongyi pao*, one piece of 800 *jin* (472 kg) *xiben pao* 洗笨礮 (smaller cannon), sixteen pieces of 140 *jin* (82.6 kg) *pishan pao* 劈山礮 (literally “splitting mountain,” a smaller cannon), 400 *jin* (236 kg) of *wofengzi* 窩峰子 (lit.: “a nest of bees,” similar to grape shot), 30 *tengpai paidao* 藤牌牌刀 (rattan shields and sabres, fig. 9, 10), 60 *kouda dao* 口撻刀 (*kouta*

50 *Junqi zeli* 24.435.

51 Source: Chen Guodong 2013, 29. There is a Dutch flag on the Taiwan ship during the Qing dynasty!

blades, similar to machetes, fig. 11), and 60 *zhugao qiang* 竹篙槍 (long bamboo spear, fig. 12). The no. 1 type Tong'an ships were equipped with two pieces of 1000 *jin* (300 kg) *hongyi pao*, two pieces of 800 *jin* (472 kg) *hongyi pao*, two pieces of 500 *jin* (150 kg) *xiben pao* cannons, four pieces of 100 *jin* (59 kg) *pishan pao* cannon four pieces of 80 *jin* (24 kg) *pishan pao* cannons, 400 *jin* (236 kg) *wofengzi*, 20 sets of rattan shields and sabres, 40 *kouda dao* and 40 *zhugao qiang*.⁵² Judging from the lists of armament, it is clear that the Tong'an ships were quite powerful for their size.

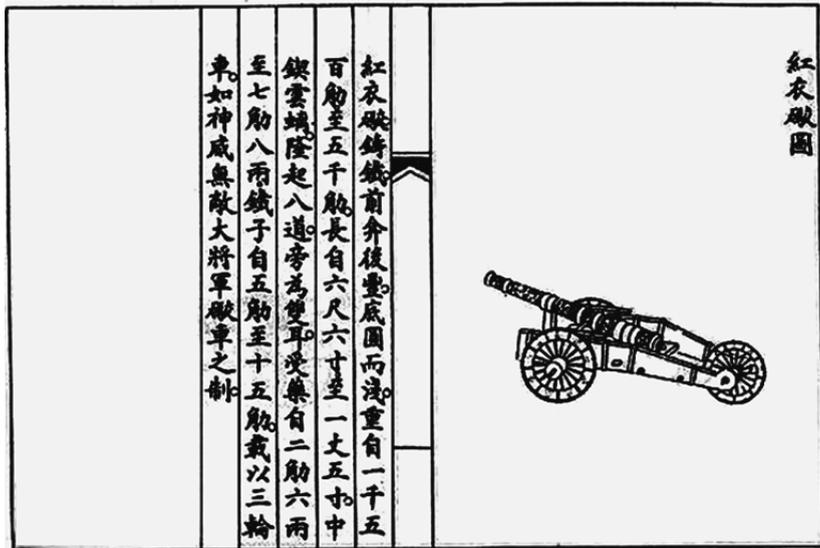


Fig. 8 *Hongyi pao* 紅衣礮⁵³

The Qing navy's main warship was the Tong'an ship during the Opium War. But the outcome of that war clearly showed that the Tong'an ship could not contend against the British navy. Therefore after the Opium War, in the twenty third year of Daoguang (1843), there were discussions of the use of the Tong'an ship as the main navy warship. In the end, it was decided to continue to use it as a navy warship on account of its deep draft, which made it appropriate for the high seas.⁵⁴ Tong'an ships thus could still be found navigating the ocean until the late Qing dynasty.

52 *Guangxu huidian shili* 898.836-837.

53 Source: *Guangxu huidian tu* 100.132.

54 *Guangxu huidian shili* 712.860.



Fig. 9 *Paidao* 牌刀⁵⁵

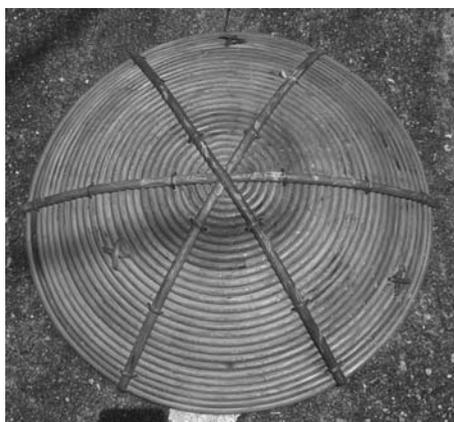


Fig. 10 *Tengpai* 藤牌



Fig. 11, 12 *Kouda dao* 口撻刀, *Zhugao qiang* 竹篙枪

55 Source for fig. 9-12: author's private collection.

Dragnet Boats

Miting 米艇 (lit.: “Rice boat”, a kind of dragnet boat), also called *Guangting* 廣艇 (Guangdong junks), were commercial ships from the Guangdong area. Dragnet boats consist of two types: single sail and double sail. If equipped with eight paddles, it could be used to patrol in the inland sea and could be sailed faster than other types of ships.⁵⁶ Therefore, it was called “spiked boat” (*tuozeng chuan* 拖繒船). It was originally created along the coasts of Eastern Guangdong and used for fishing at first. The navy found that the *miting* conveniently sailed the open sea, thus they equipped this type of ship with cannon and other types of armaments. It had great impact on the effort to restrain pirates in the Guangdong sea area. Its sharp bow and huge stern could help it withstand strong winds and waves quite well. Also, its hull was kept very low to make it impossible to attack. It could operate with paddle and scull, and was sailed well either on the ocean or on rivers.⁵⁷ It was thus chosen to be a warship for the navy.

The *miting* had inherited the traditions of Guangdong ships: It could control the enemy through fully exploiting the wind. *Miting* were also classified by size as large, medium, and small. The large one was 27.9 metres long, 6.2 metres wide, and had a draught of 2.9 metres; the medium one was 23.5 metres long, 5.58 metres wide, and had a 2.48 metre draught; the small one was 20 metres long, 5 metres wide, and had a draught of 1.5 metres.⁵⁸ Different sizes resulted in different capacities. The large *miting* could carry a crew of 80 like the larger pursuer.⁵⁹ The medium-sized boats, like no. 2 *miting* of the centre battalion of the Guangdong regiment, for example, could carry a crew of 70.⁶⁰

Before Tong'an ships became the main warships, *miting* were very important as a warship in the Guangdong area. There the dragnet boat was also used to carry rice and salt cargos. This was because of its high speed and broad hull. The salt merchants used *miting* as their main ships for transporting salt.⁶¹ After the Jiaqing reign, every province started using Tong'an ships 同安梭船 as warships because the Tong'an ship was faster than the *miting* and therefore replaced it. In the fourth year of the Daoguang reign (1824), the *miting* owned by the Fujian province were gradually disposed of at the suggestion of

56 *Jinmen zhi* 5.95.

57 *Ding Wencheng gong zougao* 8.21a.

58 *Guangxu huidian shili* 937.329.

59 *Junqi zeli* 23.435.

60 *Xuanzong Cheng huangdi shilu* 238.569.

61 *Renzong Rui huangdi shilu* 46.558.

the two *Min Zhe zongdu* (governor-generals of Fujian and Zhejiang), the former was Qingbao 慶保 (1759–1833) and the latter Zhao Shenzhen 趙慎畛 (1762–1826).⁶² Fujian shipyards started to build Tong'an ships, and *miting* gradually disappeared from the southeast coasts.

Gu Boats

The *gu* boat (*guchuan* 舢舨) was a type of civilian boat and also came out in different sizes. Some of them could not navigate the oceans as their drafts were too shallow. For this reason the *zhougu chuan* did not become a main naval warship. In addition, the Wusong naval batallion 吳淞水師營 recorded that *gu* boats were formerly called “fast patrol boats” (*kuaishao chuan* 快哨船), and were used for patrolling around the coasts.⁶³ The large size *gu* boat could navigate the ocean, thus its bottom was made in a round shape. It had a double cover, and was thus called “double bamboo matting sailboat and round-bottom *gu* boat”.⁶⁴

Gu boats mostly navigated around the Zhejiang coastal areas. Fujian and Guangdong coastal areas also had *gu* boats, but they were of small sizes. *Gu* boats in the Zhejiang area were relatively larger. For example, there were the four *gu* boats belonging to Dinghai brigade with crews of 50.⁶⁵ The small *gu* boats had a 19.2 metre long hull and their planks were 7 centimetres thick,⁶⁶ the *gu* boats built in the Zhapu 乍浦 area had crews of 40, but were equipped with cannons.⁶⁷ This indicates that the *gu* boat could serve as a kind of medium-sized warship. The smaller *gu* boat was a kind of small-sized warship with a crew of 22. It was equipped with 2 cannons (*hongyi pao* 紅衣砲, *zimu pao* 子母砲 (breech-loading cannon, literally “child and mother cannon”, fig. 13), 2 *baizi pao* 百子砲), 2 rattan shields, 72 fire arrows (*huojian* 火箭, fig. 14), 8 spurt cylinder (*pentong* 噴筒, fig. 15), 8 fireballs (*huoqiu* 火毬), 100 *jin* (59 kg) of gunpowder, 100 iron cannonballs (*tiezi* 鐵子) and 30 lead balls (*qianzi* 鉛子) in different sizes.⁶⁸ This kind of *gu* boat was mostly distributed around Chaozhou prefecture and used between the borders of Fujian and Guangdong.⁶⁹

62 *Xuanzong Cheng huangdi shilu* 68.78-79.

63 *Zhili Taicang zhou zhi* 23.454.

64 *Fuzhou fuzhi* 12.335.

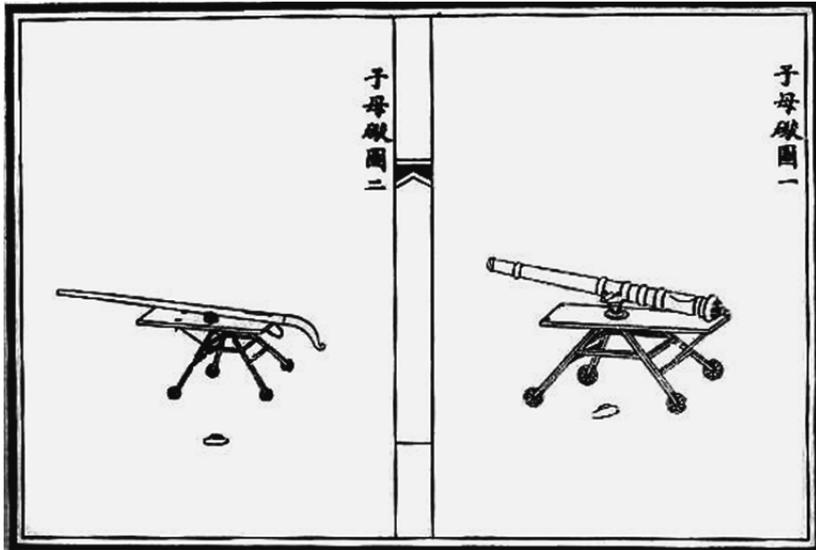
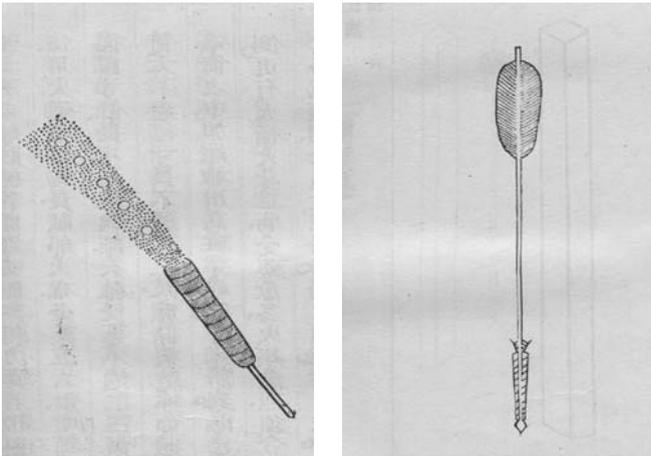
65 *Junqi zeli* 23.436.

66 *Baqi tongzhi* 40.41a.

67 *Junqi zeli* 23.435.

68 *Junqi zeli* 23.436.

69 *Shuishi jiyao*, 331.

Fig. 13 *Zimu pao* 子母砲⁷⁰Fig. 14, 15 *Pentong* 噴筒, *Huojian* 火箭⁷¹

70 Source: *Guangxu huidian tu* 100.130.

71 Source: *Guangdong haifang huilan* 21.41b (*pentong*, used to deploy a smoke screen), 42a (*huojian*, used to burn enemy riggings).

would be used. Galleys had paddles positioned on both sides of the ship, a sharp bow, and a square stern. It was similar in type to a fishing boat. It was equipped with two fir masts. One of the cabins was used to store five sails. It was almost as fast as a small pursuer, but the flat bottom prevented it from navigating the open ocean.

Different sizes of galleys were equipped with different weapons.⁷⁴ The large ones were equipped with cannons and used for battle. The smaller ones were usually employed by sub-prefectures or counties to patrol and seize smugglers, because of their high speed and flexibility.

The galleys used for patrolling were small. The eight-paddle patrol ships, for example, had crews of four, including two musketeers (*niaoqiang bing* 鳥槍兵) and two rattan shielded soldiers.⁷⁵ Ships of this scale could not fight with pirates. They could only be used to catch smugglers and police the coastal areas.

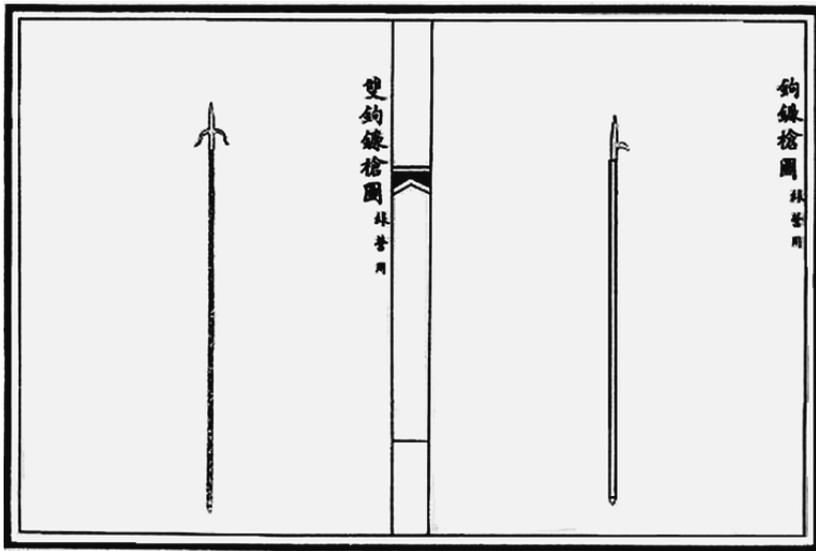


Fig. 17 *Goulian qiang* 鉤鑣槍⁷⁶

If a navy galley were to be used for battle, it would need much more powerful weapons. For example, the anterior *dubiao* battalion 督標後營 (*dubiao houying*, governor-general's command) used a number two inland river galley with two

⁷⁴ Source: *Minsheng shuisi ge biaozen xieying zhanshao chuan zhi tushuo*.

⁷⁵ *Junqi zeli* 23.436.

⁷⁶ Source: *Guangxu huidian tu* 102.149.

paddles. It had a crew of 20, one *dadu* 大纛 (marshal's banner), three *muzisha pao* 母子砂砲 (literally “mother and child sand cannon”), 300 *qianfengkou dan-zi* 鉛封口彈子 (large lead balls), 1,500 *qian qunzi* 鉛群子 (small lead balls), 2.4 kg of gunpowder, six *biandao* 扁刀 (blades), six *kuaiba* 快鈹 (fast rakes), ten *zhugao qiang* long bamboo spear, four *goulian qiang* 鈎鎌槍 (hook sickle spears, fig. 17), one gong, one drum, and one flag.⁷⁷ A lion's head was painted on the bow (fig. 18: *chuantou zhengmian fenxing tu* 船頭正面分形圖, lit. “scheme of the ship's front face”). Galleys, depending on whether they were used for patrol or battle, showed differences in crews and weapons. Although the galley was not the main Qing warship, it was often used whenever there was a need for high speed or easy sailing, as it was effective as a raider.

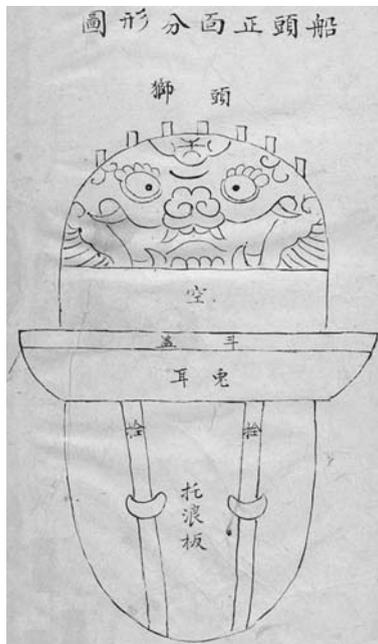


Fig 18 *Chuantou zhengmian fenxing tu* 船頭正面分形圖⁷⁸

Others

Besides those discussed above there were still other types of Qing warships. “Wind dragging boats” (*tuofeng chuan* 拖風船), for example, were often seen in

⁷⁷ *Junqi zeli* 23,440.

⁷⁸ Source: *Minsheng shuishi ge biao zhen xieying zhanshao chuan zhi tushuo*, 23r.

the Huizhou prefecture area.⁷⁹ They were smaller than the *juchuan* watercrafts, and their beam was only 7 or 8 *chi* (c. 2.21-2.53 metres). Before becoming the main warship of the Guangdong area, it was used as a commercial ship to carry salt. Before 1735, all ships of this type had a carved animal head at the bow. Later, when officials operated them as warships, the name of the owning official was inscribed in order to distinguish it from a navy ship.⁸⁰ After that, commercial ships lacked sculptures or paintings. In this way commercial ships could be differentiated from warships.

“Large troop ships” (*huxun chuan* 唬巡船) were used in the Zhejiang area. Their sizes were small and ships of this type were used for patrolling. A large troop ship had a crew of 12, along with 6 musketeers. It had 4 *hongyi pao* cannon crews, 2 rattan-shield soldiers, and 4 *baize pao* cannons.⁸¹ The smaller troop ships only carried a crew of about 4.

Fishing boats (*diao chuan* 釣船) had a 12.4 metre long hull, a 2 metre draught, one oar and two paddles. They could sail before and after the wind, and were very fast.⁸² Ships of this type were used in the Ningbo area by civilians, and later became patrol ships used by prefectures, sub-prefectures, or counties. It was a small type of warship that carried a crew of only 10.⁸³ Such vessels were turned into naval warships for naval patrolling.

Another patrol ship was called *laozeng chuan* 撈繒船 (small pursuer). It was 18.6 metres long and about 3.2 metres wide and had 22 cabins.⁸⁴ Each ship could carry a crew of 27.⁸⁵ The *laozeng chuan* navigated along the southeast coast. This type of ship was used more commonly in the Fujian and Guangdong areas.

When the pirate Cai Qian 蔡牽 (1761–1809) was plundering the Chinese coast, the provincial military commander of Zhejiang, Li Changgeng 李長庚, reported that he was going to build *tingchuan* 霆船 (“thunder ships”). Their size was the largest among navy warships, and they were built by imitating the style of the Tong’an ship. There were a total of 30 newly built *ting* boats, each with numbers and the word *ting* 霆. Each *tingchuan* had a crew of 80. The bronze and iron cannons with which they were equipped were captured from foreign ships, also there were 58 *hongyi pao* and 340 large splitting mountain

79 *Shuishi jiyao*, 331.

80 *Guangdong baifang huilan* 12.41a-42a.

81 *Junqi zeli* 23.436.

82 *Gaozong Chun huangdi shilu* 157.1247.

83 *Junqi zeli* 23.436.

84 *Guangdong baifang huilan* 12.12 (45a-b).

85 *Zhaoqing fuzhi* 10.560.

cannons (*da pishan pao* cannons 大劈山炮). They were made at Hangzhou, Ningpo, and Wenzhou.⁸⁶ The *tingchuan* was a temporary warship, built especially to confront the Cai Qian pirate group.

Tab. 5 Types of Warships⁸⁷

| Warship Name | | Length (metres) | Width (metres) | Number of Soldiers | Weapons ⁸⁸ | References |
|---|--|-----------------|----------------|--------------------|-----------------------|--|
| <i>niao chuan</i> 鳥船 (bird boat) | large bird boat | 37.2 | 8 | 70 | c + g | <i>Xuanzong Cheng huangdi shilu</i> 323.1077 |
| | medium bird boat | 25-31 | 6.1 | 30 | c + g | |
| | small bird boat | 13 | 3.4 | 20 | c + g | <i>Quanzhe bingzhi</i> 3.84 |
| <i>gan zeng chuan</i> 趕繒船 (pursuer) | large pursuer | 30 | 6 | 80 | c + g | <i>Guangxu huidian shili</i> 936.318 |
| | medium pursuer | 23 | 5.2 | 60 | c + g | |
| | small pursuer | 20 | 4.6 | 40 | c + g | |
| <i>juchuan</i> 艍船 (water-craft) | <i>da juchuan</i> 大艍船 | 27.6 | 6.8 | 60 | c + g | <i>Fujian tongzhi</i> 84.38a |
| | <i>shun zihao</i> 順字號 (<i>shun</i> type) | 20 | 5.5 | 50 | c + g | |
| | <i>bi zihao</i> 濟字號 (<i>ji</i> type) | 17 | 4.6 | 40 | c + g | |
| <i>Tongan chuan</i> 同安船 | <i>ji zihao</i> 集字號 (<i>ji</i> type) | 25.4 | 8 | 80 | c + g | <i>Fujian tongzhi</i> 84.37b-38a |
| | <i>cheng zihao</i> 成字號 (<i>cheng</i> type) | 24 | 7.4 | 70 | c + g | |
| | no. 1 一號 | 22.3 | 5.8 | 60 | c + g | |
| | no. 2 二號 | 19.8 | 4.9 | 50 | c + g | |
| <i>miting</i> 米艇 | large <i>miting</i> | 28 | 6.2 | 80 | c + g | <i>Guangxu huidian shili</i> 937.328 |
| | medium <i>miting</i> | 23.56 | 5.5 | 70 | c + g | |
| | small <i>miting</i> | 19.8 | 4.9 | 60 | c + g | |
| <i>tingchuan</i> 霆船 | | 32.8 | 9 | 80 | c + g | c + g |
| <i>jiangchuan</i> 槳船 (galley) | | 15.5 | 2.8 | 10-40 | c + g + s | <i>Minsheng shuishi ge biao zhen xieying zhanshao chuan zhi tushuo</i> , 13r |
| <i>shaochuan</i> 哨船 (patrol boat) | | 21.7 | 5.8 | 70 | c + g + s | <i>Gaozong Chun huangdi shilu</i> 256.320 |

86 *Leitang'anzhu dizi ji* 2.29.

87 Source: *Guangdong haifang huilan* 12.45a.

88 Weapons: "c" short for "cannons"; "g" short for "guns"; "s" short for "spears".

Quantities of warships

The Qing government followed Ming dynasty practice and mainly distributed warships to Zhejiang, Fujian, and Guangdong. During the Ming dynasty, Zhejiang had the most warships assigned, such as *fu* 福 (Fujian junk, like pursuer), *cang* 蒼 (Zhejiang junk, like bird boat) and *shabu chuan* 沙唬船 (Zhejiang junk, like *balahu*), a total of 1,008. During the Kangxi reign in the early Qing dynasty, the focus of coastal defence shifted from Zhejiang to Fujian due to the fighting against Koxinga's (Zheng Chenggong 鄭成功, 1624-1662) Ming loyalists. The number of warships reached its first peak in 1683, most of them stationed in Fujian (see tab. 7). Apart from the Zheng regime, another reason was that Fujian was located in the middle of the three provinces along the coast of southeast China, hence Fujian's defence forces were expanded. Furthermore, the piracy problem from Kangxi to Jiaqing reign occurred mostly along the coast of Fujian. Therefore, Fujian was assigned the largest quantity of warships.⁸⁹

There seems to have been a reduction of fleets during the Yongzheng reign (tab. 7). According to the *Yongzheng chao da Qing huidian* 雍正朝大清會典 (Collected Statutes of the Great Qing dynasty, Yongzheng reign), the total of warships in the three provinces were 118 in Zhejiang, 312 in Fujian, and 107 in Guangdong.⁹⁰ After the Qianlong reign, the numbers of warships were only slightly adjusted: 218 in Zhejiang, 338 in Fujian, and 166 in Guangdong. Zhejiang was always second in numbers of warships.

The piracy problem reoccurred during the late Jiaqing period. In the fifteenth year of Jiaqing (1810), the number of warships reached another peak. Fujian had 432 warships including some 300 seagoing ships, Zhejiang had 311 warships including 250 seagoing ships; and Guangdong had 455 warships including 277 seagoing ships (see tab. 6). If the patrol boats of sub-prefectures and counties are also counted, numbers would be even higher. Guangdong warships increased dramatically and started to surpass the number of Fujian's warships, because during the Daoguang reign maritime trade had increased at Guangzhou. In response, the Qing government gradually added more warships to Guangdong.

The types of warships that were in use also changed. The Tong'an ship had displaced the pursuers. According to *Junqi zeli* Fujian naval forces had 136

⁸⁹ *Zhejiang tongzhi* 90.21b.

⁹⁰ *Yongzheng huidian* 209.13901.

Tong'an ship and 38 *miting*, and Taiwan naval forces manned 73 Tong'an ships.⁹¹ This shows that Tong'an ships had already displaced other types. At the same time, Qing government also increased the patrol boats by hundreds, to police the coastal areas.

In general, the Qing government only increased their number of warships and crews when the circumstances required it, mostly to confront enemies. As soon as the situation eased, they would decrease the number of warships and crews again.

Tab. 6 Types and Numbers of Warships in Zhejiang, Fujian, and Guangdong (Qianlong reign)⁹²

| Types of Warships (in:) | Zhejiang | Fujian | Guangdong |
|---|----------|--------|-----------|
| patrol boat (<i>xunchuan</i> 巡船) | 14 | | |
| flat-bottomed boats (<i>pingdichuan</i> 平底船) | | 20 | |
| fishing boat (<i>diaochuan</i> 釣船) | 36 | | |
| wind dragging boats (<i>tuofeng chuan</i> 拖風船) | | | 5 |
| patrol boats (<i>shaochuan</i> 哨船) | 9 | | |
| patrol boats (<i>jushao chuan</i> 躡哨船) | | 2 | |
| large troop ships (<i>dage chuan</i> 大舸船) | 1 | | |
| small troop ships (<i>xiaoge chuan</i> 小舸船) | 4 | | |
| galley (<i>pengzi chuan</i> 舟彭仔船) | | | 17 |
| total number of warships: | 218 | 338 | 559 |

Tab. 7 Numbers of Warships in the Qing Dynasty

| Era | Zhejiang | Fujian | Guangdong | References |
|-----------------|----------|--------|-----------|--|
| Shunzhi reign | 352 | 205 | 405 | <i>Kangxi huidian</i> 139.6945 |
| Kangxi reign | 39 | 524 | 494 | <i>Yongzheng huidian</i> 209.13900 |
| Yongzheng reign | 118 | 312 | 107 | <i>Yongzheng huidian</i> 209.13901 |
| | 197 | 342 | 166 | <i>Baqi tongzhi</i> 40.44b |
| Qianlong reign | 196 | 338 | 166 | <i>Qianlong huidian zeli</i> 115.1797-1798 |
| Jiaqing reign | 311 | 432 | 455 | <i>Jiaqing huidian shili</i> 575.28b-30b |
| Guangxu reign | 59 | 81 | 211 | <i>Guangxu huidian</i> 712.856 |
| | 298 | 339 | 197 | <i>Bingzhi kaolue</i> 6.37-40 |

91 *Junqi zeli* 23.435.

92 Source: *Qianlong huidian zeli* 115.1797-1798.

Conclusion

Shipyards were concentrated near the sea or tidal rivers to allow easy access for keel materials, transportation and subcontractors. In terms of the technology of warships, there were no research institutes for new designs and development of nautical vessels during the Qing dynasty. In the construction of warships they mainly learned from observing civilian ships. The number of warships assigned to a certain coastal area depended on current needs. Thus Qing warships could deal with aggression from other Asian countries and from pirates, but could not withstand the large, steam-powered ships of European countries.

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