Shipbuilding at Bombay

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The arrival of the Portuguese by sea in 1498 introduced navy as a new parameter in the Indian geopolitical equations, placing the Indian rulers at a disadvantage for all times to come. The Portuguese and the Dutch success in East Indies as brought home by the capture of their ships brought the British to the Indian shores in 1608. The trade was extremely lucrative despite the risks. During the third voyage cloves were purchased at Moluccas for £2948, which on return to England fetched £36,287. The first 11 years of trading with East Indies (including India) 'gave clear profits, seldom below one hundred, and often more than two hundred, per cent, on the capital invested on the voyage[1]. The Portuguese violently opposed the British presence in what they considered to be their own zone of influence. The British decided to meet force with force and inflicted a crushing defeat on the Portuguese on sea in 1612. The chain of events that culminated in the 1757 battle of Plassey in Bengal had its beginning in this sea skirmish. The naval prowess and the religious neutrality of the British greatly impressed the Mughal emperors who though powerful on land like the elephant were helpless on sea which was infested with European crocodiles. The British were asked to contain the fanatically anti-Muslim Portuguese, who were particularly severe on the Haj pilgrims. In return the English merchants received attractive business concessions. (Another factor in favour of the British was the expertise of its ships' doctors, which was made available to the Mughal umra, that is nobility.)[2]

To protect its trade from the Portuguese and the pirates, the English merchants at Surat locally established, in 1613, east India company's marine. The small naval service consisted of coastal boats, known as grabs and gallivats, on which were mounted two to six guns and which were manned by volunteers from the company's ships who fought as well as traded. This service developed first into Bombay marine and finally into Indian navy[3] (see Table 1). Generally speaking,

marine was meant to protect the coastal area, whereas the navy could cast its net wider. It is said that at one time when Lord Nelson, 'the future victor of Nile and Trafalgar was in embarrassed circumstances, he was a candidate for the appointment of the superintendent of the Bombay marine'[4].

The seaport of Surat was located some 12 miles to the west at a village called Swally. The British repaired their old ships here and in course of time started building new ones. Surat had a long tradition of shipbuilding and even the Mughal emperors got their ships built here. (Figure 1 shows a traditional boat that was used on the eastern waters.) Once the British shifted from Surat to Bombay, shipbuilding activity was also transferred. The first Europeans to touch Bombay were the Portuguese who arrived at Mahim in 1509 and took over the island in 1534. In 1538 (or 1541) Bombay was rented in perpetuity to Garcia d'Orta, a physician and professor of Lisbon (and said to be a converted Jew). He paid a yearly quit rent of about £85. In 1563 he wrote a book 'Dialogues on simples and drugs' where he mentions the island under the names of Bombaim and Mombaim. D'Orta lived in India from 1534 to 1572 (ref. 5).

Bombay

While Portugal and Britain were engaged in bitter rivalry in India, they entered into a royal marriage contract which had far reaching consequences[6]. The English king Charles II married princess Infanta Catherine of the House of Braganza of Portugal. According to the 11th article of the treaty of marriage,

Table 1. The evolution of Indian navy 1612–1950

1613–1686	East India company's marine
1686–1830	Bombay marine
1830–1863	Her majesty's Indian navy
1863–1877	Bombay marine
1877–1892	Her majesty's Indian marine
1892–1950	Royal Indian navy
1950–	Indian navy

dated 23 June 1661, her dowry included 'the Port and Island of Bombay in the East Indies, together with all the rights, profits, territories, and appurtenances thereof whatsoever'. The small island, some eight miles long and three miles wide, no doubt mattered little to the king of Portugal. But it enclosed a land-locked bay and its natural harbour could shelter a large fleet. When the news reached India, the Portuguese circles in India were dismayed and immediately pointed out the disadvantages of making such a gift. An attempt was made to purchase the island back from England, but Charles II wanted such large sums 'that they reach to millions'. The island of Bombay was finally transferred to England on 8 February 1665, without any trace of grace or pleasantness that one normally associates with a bride's dowry. The king's governor of Bombay soon discovered that the island cost more to govern than it yielded as revenue. By a charter dated 23 March 1668, Charles II granted the port and island of Bombay to the East India Company 'to be held to the said Company... in perpetuity and in free and common soccage at a fee farm rent of £10 payable on the 30th of September yearly at the Custom-house'. The island of Bombay was formally handed over to the east India company on 23 September 1668.

While opposing the inclusion of Bombay in the dowry, the Portuguese viceroy of Goa [Antonio de Mellow de Castro] had written[7], 'I foresee that India will be lost the same day on which the English Nation is settled in Bombay.' These words were prophetic indeed. The British shifted their capital from Surat to Bombay in 1686. The little island became the naval fortress from where Britain went ahead to build a vast overseas colonial empire.

Dockyard

Bombay had taken to shipbuilding in the Portuguese time itself. In 1625 when the English and the Dutch jointly raided Bombay they found two boats under construction which they promptly put to
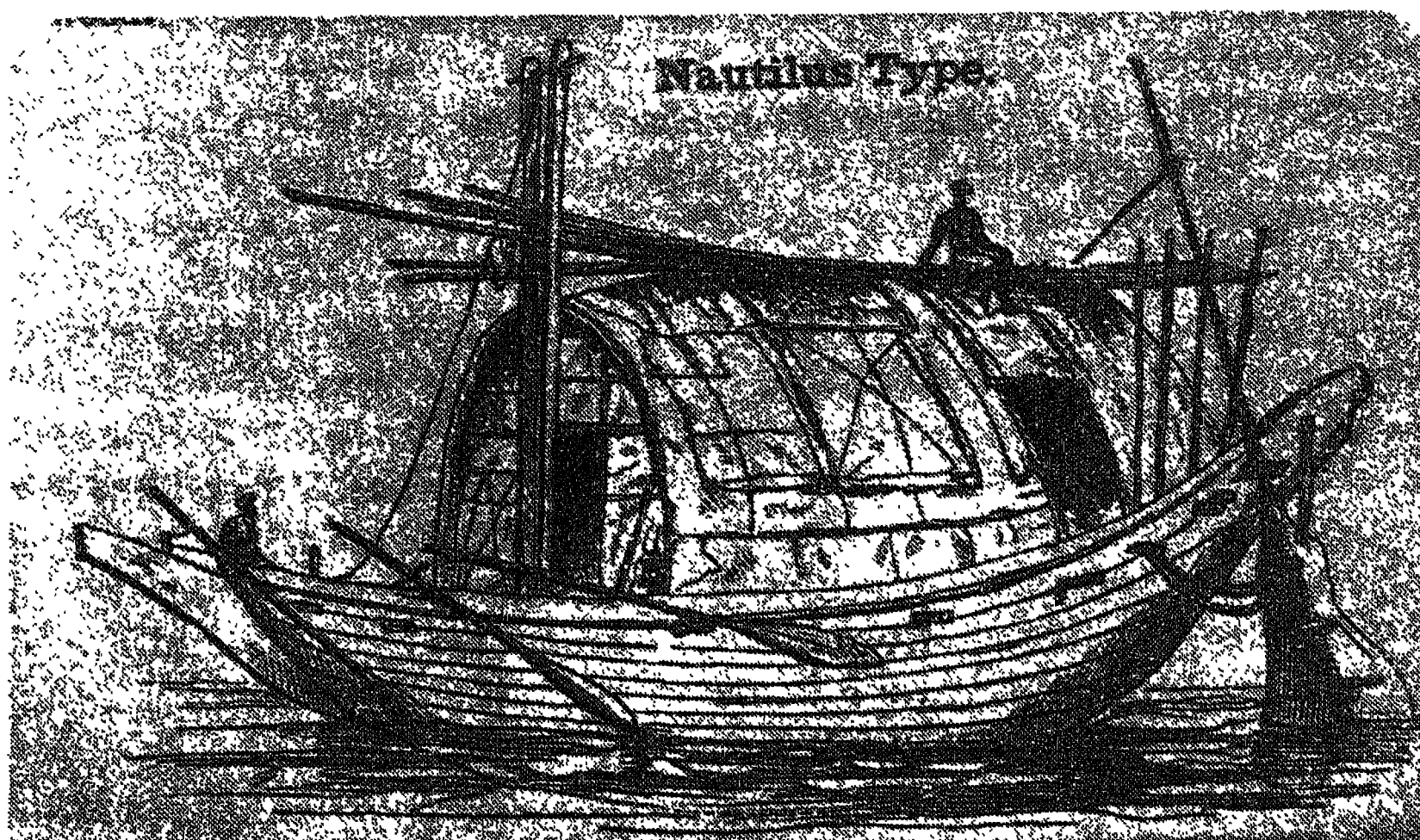
Figure 1. 'Decca Pulwar', of 17 ton burden, used on the eastern branches and upper channels of the deltas of Ganga and Brahmaputra. The bottom of the boat resembles the immersed portion of the nautilus shell. 'These are well-built boats of hard wood, and use square sails.' (Henderson A., British Association for the Advancement of Science Report for 1858, p. 272.)

flames. As soon as Bombay passed into the British hands, repairs and shipbuilding were started under the new auspices. The British repaired their merchant ships. In addition they built new ones to deal with the menace of piracy from Indian and foreign adventures as well as to meet the threat from their European competitors. There were problems, though. The Portuguese obstructed the supply of timber, and the Mughal authorities did not permit good carpenters to leave Surat. Most of the carpenters at Surat were Parsis. A letter from Bombay to Surat dated 10 January 1736 states that 'We have intention to build a new grab but we are in want of a good carpenter. We are told that there is one in Surat named Lowjee. If he will come hither he shall have all fitting encouragement'. Lowjee Nusserwanjee [Wadia] arrived in Bombay from Surat in March 1736, accompanied by ten other carpenters. The salary demanded by them was pretty high, but the Bombay government hoped that 'they would deserve it by their performance'. (The hope was certainly fulfilled. Lowjee was designated master builder in 1740. The post remained with his descendants till 1884 when the dockyard was transferred from the Bombay government to the Indian government[8]. Figure 2 shows Lowjee

or Lowji's son and successor Maneckji Lowji. The surname Wadia was not appended in official correspondence.)

This was the time when the British were engaged in a bitter fight against the piracy of the Angrias, which lasted more than 40 years from about 1707 to 1751. Connajee or Kanhojee [Kanha-ji] Angria was a common seaman in Shivaji's fleet, but rose to command a fleet of his own. 'Animated by a lust for plunder, there now flocked to his standard numerous adventurers, including renegade Christians, mostly Dutch and Portuguese, Arabs, Mussulmen and Negroes, a most daring and desperate band'[9]. (Note the selective use of the adjective renegade.) Kanha-jee Angria died in about 1731 and was suceeded by his son Sambhajee. He was finally defeated by the British in 1751. During the period Bombay built a number of coastal boats apart from repairing merchant ships. In 1745 two boats were made for the viceroy of Goa for use against his enemies. This was done as the 'same will be the means of keeping a number of workmen upon the Island and be otherwise beneficial'. In addition to meeting its own requirements on the west coast, Bombay also built ships for Calcutta and Madras. Construction of a dry dock was taken up in 1749. This

first dry dock to be built in India is still in use, now known as the upper old Bombay dock. Others were built in the following years.

In the first phase of shipbuilding the emphasis had been on repairs and construction of coastal boats for protection. The things however soon changed. Increasing prosperity of the east India company meant building of bigger and larger number of ships in England. This and the marine rivalry in Europe resulted in large scale felling of oak trees in Britain. Accordingly in 1772 the company was prohibited from building any large ships. They were asked instead to either build their vessels in India or colonies or to charter vessels built there. Preservation of British oak forests was one reason. Superiority of teak over oak was another. Oak contains lignic acid 'which corrodes and consumes the very metal (iron) which is employed to unite and secure it in the various forms into which it is converted for the purposes of naval architecture'. In contrast teak 'abounds with oleaginous particles, the best and certain defence of iron from corrosion by the action of the acid'. In addition 'teak was not disposed to splinter to the same extent as oak' and thus 'the effect of shot upon teak is far less dangerous than upon oak[10]

Figure 2. Maneckji Lowji Wadia (1720–92), the second master builder of Bombay dockyards 1774–92 (picture courtesy: Neville N. Wadia).

The shipbuilders in Britain were not impressed by these arguments. Their main concern was loss of business. As a sop to them, the British parliament ordered that the crew and the captain of Indian ships should be Englishmen. The British Indian government chipped in by levying 15% duty on goods imported into India in India-built ships but only half this amount on goods brought in British-built ships. In addition, it was stipulated that only British ships could import goods 'from south and east of the Cape of Good Hope'.

Ship-building industry in Bombay under the leadership of the Lowjee family now entered its golden age[11]. The frigate 'Cornwallis' built for the company in 1800 by Jamsetjee Bomanjee was found to be so beautifully constructed and of such great strength, that it was purchased by the admiralty. Jamsetjee took a private revenge for the racial insults that were the order of the day. On the kelson of this ship, he carved the words 'this ship was built by a d-d Black Fellow A.D. 1800'. Attention was drawn to this by Jamsetjee himself when the ship, renamed Ackbar by the admiralty, returned to the Bombay docks many years later[12].

In 1810, Bombay built a 74 gun vessel 'Minden' for the British navy. It was the first line of ship of the admiralty built outside UK[13]. At about the same time 'a similar vessel was subscribed by the inhabitants of Calcutta, built at Kidderpore, and presented to the Admiralty'[14]. The admiralty however was not impressed and 'did not oblige by placing a further order for a vessel of that size with the Calcutta shipwrights'[15].

An 18 gun ship 'Clive' built at Bombay in 1826 lends itself to a brief mention of the prevalent slave trade and the patronage it received[16]. Commander of the ship, John Croft Hawkins, was asked in 1830 'to proceed to the coast of Africa and islands in its vicinity' and 'to adopt the best means of entering for the service as many able-bodied lads as you can, in age from twelve to eighteen, free from all disease and bodily infirmity, and of that compact symmetry best calculated for seamen.' On his return Hawkins was tried for slave trade. It became certain that there were other secret instructions that were never brought on record. Hawkins in fact did not permit his lawyer to address the court lest the lawyer compromise for the sake of his client the navy superintendent or the government. It was

implied that the case was brought to trial not because of the illegality involved but because the judge of the high court wished to embarrass the Bombay governor (Sir John Malcolm) and his brother, the navy superintendent (Sir Charles Malcolm).

The court pronounced Hawkins guilty of slave trade and condemned him to 'be transported to the east coast of New South Wales for the term of seven years.' The sentence was however subverted. Hawkins was put in a navy ship with clear instructions that he be treated as an officer and a gentleman. When the ship touched Madras, Hawkins and the ship commander 'were feted for three days by the community'. At Batavia [Jakarata], the commander decided with a straight face that his ship could not proceed to Sydney. It must be diverted to England to deliver some important despatches that had accumulated at Batavia. In London, the president of the company obtained an interview with the king who pardoned Hawkins and 'graciously commanded that he should appear at the next levee.' 'Commander Hawkins obeyed the royal mandate, when His Majesty received him with great kindness, and conversed with him.' Hawkins was paid his back wages as well as lawyer's fees and reappointed to the command of his old ship 'Clive'. He rose to become the superintendent of Indian navy.

Steam navigation

Although a patent had been obtained as early as 1736 (by Jonathan Hull) for applying steam engines to propel ships, it was not till the steam engine was perfected by James Watt that steam navigation could show signs of success. The lead came from USA, which did not have roads but had large tree-lined rivers. The first steam vessel that was a practical success and remunerated its owners was a river boat 'Clermont' that in 1807 ran the 146 mile distance between New York city and Albany. It was almost immediately followed by the first sea-going vessel[17]. In Britain steam navigation was established in 1817 with a small 3.5 HP steam boat 'Comet' on river Clyde. The first regular sea-going steamer, 'Bob Ray', with a 30 HP engine commenced operation in 1815 between Glasgow and Belfast. In 1819, the British navy acquired its first steamer, named 'Comet'.

Britain was now an industrial nation, and captive India was the best thing happening to it. In the year 1793, England sent out cotton goods worth £156 to India. In the year 1802 the figure was £27,876, while 10 years later it had gone up to £108,824. In 1813, the British parliament abolished the trade monopoly of the company, so that the British manufacturers and traders were now free to enter the huge Indian market. During the 16 years after 1813, the company's annual trade averaged £1,882,718 whereas private trade was three times higher at £5,451,452 (ref. 18). (In 1833 the company ceased to be a trader altogether. It became administrator and ruler of India, deriving its dividend from the revenues from the country. Control of India passed to the crown in 1858, and the company was wound up in 1874.)

The merchants were keen to introduce steam navigation on three routes: on the placid north Indian rivers, in the opium-tea trade with China, and for steam communication between Calcutta and England. Early steam machinery was rather daunting. It used coal voraciously and was extremely complex for easy maintenance. Merchants neither had the capital nor the patience to see it through the developmental stages. The company, no longer the monopolist it once was, had no intention of sinking its money into steam for trade, but it had wars to win. What saw the steam navigation through was the Burmese war 1824–26 (refs 19, 20).

Captain Charles James Collie Davidson of Bengal engineers and son of a Calcutta merchant brought an 8 HP engine with an iron boiler and meant for a river boat. It was the first steam engine in India. It was left to rust till the company bought it in 1822 for use in a dredging boat. When the Burmese war broke out it was converted into a pedal boat and fitted out as a floating battery. 'Though her speed was only 4 knots, much benefit was derived from her in the passage of troops over creeks and estuaries of that [Arakan] coast'.

Incidentally, the first steam-propelled vessel in India does not belong to the realm of compulsions of history, but to the romance of history, as exemplified by the idiosyncracies of a nawab. Displaying a magpie like fascination for novelties and probably as a commemoration of declaration of 'independence' from the titualar emperor of Delhi, nawab Ghazi-ud-Din Haider of

the rich north Indian state of Oudh (correctly Avadh) got a river boat built for himself at Calcutta, in 1819. It has an 8 HP butterfly engine which gave the boat a speed of 7–8 miles an hour. The boat was a toy; when the governor-general of India visited Lucknow, the boat was decked up for inspection. (The nawab, who had a European wife, also built a short-lived modern observatory at Lucknow.)[21]

The economics of early steam navigation can be seen from Calcutta's first steamer, 'Diana'. A member of the company's factory at Canton ordered a pair of 16 HP engines with a copper boiler and the whole frame with a view to getting a river steamer built for service on the Canton river. Unable to go ahead with his scheme, he reshipped the whole thing to Calcutta and offered it to the government for Rs 65,000, which was however refused. A group of merchants bought it and spent another Rs 10,000 to replace the original oakwood frame with the sturdier one of teak. The steamer was launched in 1823. The next year, luckily for the owners, the government bought it for Rs 80,000 for the Burmese war[22]. 'Diana', unaffected by the south-west monsoons, was the 'star of the war'. Called 'fire devil' by the Burmese, it easily brought about British victory which secured Assam and added the provinces of Arakan and Tenesserim to the Company's fold[23].

The river steamers were no substitute for steam link between Calcutta and England, for which both the government and merchants worked. A steam fund of Rs 69,903 was collected at Calcutta and offered as a prize to any one whose steamship could make four consecutive voyages between Bengal and England at an average of 70 days per trip (via the cape of good hope). Towards this fund Rs 20,000 came from the governor-general, Rs 2,000 from the nawab of Oudh, and the rest from various businessmen of Calcutta[24]. The investors in England made a gallant attempt to rise to the occasion by building Britain's first sea-going ship propelled by steam[25]. Aptly named 'Enterprize', it was a ship of 500 ton powered by two 60 HP engines, with copper boilers extending across the ship, and seven furnaces, each seven feet in length. Carrying passengers and 30 tons of coal, 'Enterprize' left England in August 1825, and took as many as 115 days to reach Calcutta under steam and sail. The

performance was declared unsatisfactory by the mercantile community, because a splendid sailing ship could cover the same distance in 90 days. Steam enthusiasts were disappointed but not the investors. On its arrival at Calcutta, 'Enterprize' was purchased by the government for £40,000, and sent to Rangoon. It was put to use for towing ships between Calcutta and the newly acquired territories.

It was not only Calcutta that was interested in a steam link to England. Bombay was interested even more. Monsoon winds made it easier for a sailing ship to reach Calcutta than Bombay. Steam would give Bombay the benefit of shorter distance to Europe. The Bombay governor, Mounstart Elphinstone, made 'a distinct official proposition' in 1823 to the court of directors for the establishment of steam communication between Bombay and England, via the Red sea. (In the pre-Suez canal days this involved an overland journey across Egypt to reach the Mediterranean sea.) The proposal was renewed in 1826, 'but the Court were unwilling to act upon the suggestion'. Elphinstone's successor, Sir John Malcolm, decided to go ahead on his own. A steamer was built at the Wadia dockyard and ironically named 'Hugh Lindsay' after the sceptical company chairman. 'Hugh Lindsay' was a small ship of only 411 tonnes, with two 80 HP engines. It left Bombay in March 1830 on its experimental voyage of 3000 miles, to Suez. It had to carry sufficient coal to reach Aden, 1641 miles away. Before 'Hugh Lindsay' left, a collier brig, laden with 600 tonnes of coal, was dispatched so that coal could be stored at Aden, Jiddah and Suez. 'Hugh Lindsay' itself carried as much coal as it could, filling with coal more than two thirds of the space meant for passengers. The voyage was a spectacular success. The ship could reach Aden in 11 days under steam alone. The journey to Suez took a total of 32 days consisting of 21 days of actual journey and 11 for stoppages. 'Hugh Lindsay' made a total of five voyages to Suez till 1833, all heavily subsidized. The average expense of coal per voyage was Rs 46,250 while receipts from passengers and letters averaged only Rs 14,225 (ref. 26). Finally in 1834, the parliamentary committee resolved that 'it is expedient that measures should be immediately taken for the regular establishment of

steam communication[27] with India by the Red sea', asking at the same time that 'the expenses may be materially reduced'.

Steam navigation had far-reaching consequences. First, Bombay became gateway to India. It has continued since then as the business capital of India. Secondly, the Red sea and the Persian gulf area was scientifically surveyed. Finally, all the countries en route lost their independence[28]. To provide 'Hugh Lindsay' with fuel, the small island of Socotra, off the horn of Africa, was needed as a coaling station. Accordingly it was taken over by the British in 1835. Soon, it was realized that Aden was a better choice; it was taken by force in 1839. The only bottleneck in the Red sea route was the 10-day long arduous journey across Egypt. Suez canal was dug in 1869. Ironically, it was dug with French capital, even though the biggest beneficiaries were the British interests. The first ship to pay the toll on the Suez canal was British. Egypt was added to the British colonial empire in 1882.

Introduction of steam navigation did not mean immediate end of sailing ships. Early steamships were so unprofitable that they had to depend on government subsidies. The commercial viability of steam came only when engines were greatly improved and ships were made of iron and then of steel. This effectively brought teak-ship building at Bombay to a close, bringing to an end a chapter in the colonial history. From 1736 to 1884, the Wadias built a total of 334 vessels for a variety of owners: East India company, private merchants, Nizam of Hyderabad, Imam of Muscat, and the British navy. Out of these 334, 39 were either specifically built or subsequently acquired by the British navy during the period 1777–1849. A frigate Trincomalee built in 1817 for the British navy is still afloat under the name 'Foudroyant'. The Wadia vessels were put to a wide variety of use, from carrying coal to the Bombay governor himself. For completeness it may be added that from 1885 to 1936 another 46 vessels were built at the Bombay dockyards[29].

Britain owed its colonial empire to its sea power. The Bombay dockyard under the Wadias was an important, though small, contributor towards efficient and low-cost maintenance of that power.

1. Low, C. R., *History of the Indian Navy*, vol. 1, 1877; see pp. 6, 12. [Gives

a detailed account of events 1613–1863.]

2. A ship's doctor [Gabriel Boughton] visited Shah Jahan's court at Agra in 1645 and later served as a surgeon to the emperor's son Shah Shuja who was the viceroy of Bengal. Then in 1716, the company's embassy to Delhi included a surgeon [William Hamilton] who cured the emperor of a painful disease that had delayed his marriage. In both cases, medical services were reciprocated with handsome gifts and trading concessions. See Crawford, D. G., *A History of the Indian Medical Service*, 1914, vol. 1, pp. 51, 113.
3. Wadia, R. A., *The Bombay Dockyard and the Wadia Master Builders*, Bombay, 1957 (Reprint 1983), 2nd edn, see p. 20.
4. Ref. 1, p. 525.
5. Douglas, James, *Glimpses of Old Bombay and Western India*, 1893, vol. 1, p. 249.
6. Ref. 1, p. 54.
7. da Cunha, Garson, *Origin of Bombay*, pp. 247, 258; cited in ref. 3, p. 9.
8. The Wadias received three grants of Inam land in Bombay; they were the only ones ever granted. The first was in 1783, the second was in two instalments in 1821 and 1849, whereas the third was in 1884 on the retirement of the last master builder (ref. 3, pp. 167, 251, 319). In addition, there were a number of presents of medals, rulers and shawls. The prestige earned by the shipbuilding Wadias helped other branches of the clan in establishing themselves in various lines of business.
9. Ref. 1, p. 97.
10. Ref. 3, ch. 6.
11. This ended the golden age of the Malabar-teak forests. Finally, in 1847 when iron was replacing teak as the material for building ships, a conservator of forests [Dr Alexander Gibson] was appointed at Bombay.
12. Ref. 3, p. 191.
13. The national anthem of USA, 'star-spangled banner', was composed by Francis Kay on board the 'Minden' when it was in Baltimore. Ref. 3, p. 208.
14. This was 'Hastings', the 74 gun, solitary, line-of-war ship built at Kidderpore near Calcutta in 1818. The dockyard was established in 1780 by Henry Watson (1737–86) of Bengal engineers, on a piece of land obtained as a grant from the government. In 1781 he launched the 36 gun frigate 'Nonsuch'. In 1788 he launched another frigate, the 'Surprize', of 32 guns. 'But his resources were by this time exhausted; after having sunk ten lakh rupees in his dockyard, he was obliged to relinquish it'. The major activity at Kidderpore was in the hands of the two Kyd brothers James (1786–1836) and Robert (d. 1825) sons of Lt. Gen. Alexander Kyd, the surveyor general of Bengal 1788–94. The two brothers were trained in shipbuilding in England. Returning to Calcutta in 1800, they were apprenticed to Waddell, the company's master builder. On his retirement in 1807, they purchased the Kidderpore dockyard, with James Kyd becoming master builder to the company. A total of 25 ships were built at his dockyard including Hastings. 'Diana' the first steamer on river Hughli, was built in 1823. On James Kyd's death in 1836, the dockyard was purchased by the government. See Buckland, C. E., *Dictionary of Indian Biography*, 1906, pp. 442, 239; Phillimore, R. H.,

Historical Records of the Survey of India, 1945, vol. 1, p. 394.
15. Ref. 3, p. 212.
16. Ref. 1, p. 505.
17. Since Robert Fulton, the owner of 'Clermont', had obtained the exclusive right of navigating the waters of the state of New York, John Cox Stevens boldly conveyed his ship from New York city to Delaware by sea. Samuelson, Martin, *Q. J. Sci.*, 1864, 1, 239.
18. Dutt, Romesh, *The Economic History of India*, 1906, 2nd edn, vol. 1, pp. 183, 209.
19. Ref. 1, pp. 520–532; Ref. 3, ch. 12.
20. Headrick, D. R., *The Tools of Empire*, Oxford Univ. Press, 1981, ch. 1.
21. Kochhar, R. K., *Vistas in Astronomy*, 1991, 34, 69.
22. Ref. 3, p. 288.
23. Ref. 20, p. 21; also see ref. 19.
24. Ref. 20, p. 134.
25. Ref. 19, 20.
26. Ref. 1, p. 532.
27. Much to its humiliation, Indian navy was asked to run a steam service for post and passengers from 1838 to 1854 when the service was handed over to the private Peninsular and Oriental Steam Navigation Co. See ref. 20, p. 138.
28. Ref. 20, pp. 136, 156.
29. Ref. 3, App. B & C.

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