Victory at sea

In the present state of Europe, wrote the duke of Choiseul, chief minister of France in the 1760s, 'it is colonies, trade and, in consequence, seapower which must determine the balance of power upon the continent.' Some historians have argued that this had been true for at least a century, even perhaps since the defeat of the Spanish Armada in 1588. But such opinions beg the question of what, precisely, 'seapower' meant in the age of sail. Few at the time thought of it as more than the ability to send troops or trade-goods across the waters that separated a state (or its allies) from the place where they were required, and to prevent the enemies of the state (or its allies) from doing the same. No statesman in early modern Europe equated seapower with complete naval mastery in all areas, with 'that overbearing power on the sea which drives the enemy's flag from it, or allows it to appear only as a fugitive' — the influential definition offered in 1890 by A. T. Mahan in *The influence of seapower upon history*, 1660–1783 — for the simple reason that no early modern state possessed the naval strength to achieve this. Mahan, after all, was primarily a naval theorist who sought to find and formulate 'universal rules' for the successful conduct of war at sea similar to those proposed by Jonini for land warfare. He was not a trained historian. Indeed, Mahan, once stated that:

Written history should consist of the 'artistic grouping of subordinate details around a central idea'; that some facts were 'not really worth the evident trouble' of searching them out; that the 'scholar's passion for certainty may lapse into incapacity for decision'; and that 'facts must be massed so well as troops' and kept subordinate to the 'central feature'.

It is worth remembering that *The influence of seapower upon history* contained no discussion of guns, sails or ship design, because the author did not believe that changes in these things could affect the application of strategic principles.

And yet Mahan addressed a major issue, which many previous historians had ignored: the period between the 'great discoveries' in the 1490s and the proliferation of railways in the 1840s was indeed the golden age of seapower, a time during which control of strategically important waters decided the balance of power both in Europe and beyond. And this was because a revolution in naval warfare occurred in early modern Europe which was no less important than that by land, for it opened the way to the exercise of European hegemony over most of the world's oceans for much of the modern period. At the centre of this revolution, too, lay the adoption of the gun, which the West used at sea with ruthless skill to control or destroy all its maritime rivals — starting with America, and moving through Africa and South Asia to Japan and China.

Herein lies a great irony, for it is now beyond dispute that the entire development of firearms was originally Chinese — from the first discovery of the correct formula for gunpowder (which is now thought to have occurred as early as the ninth century AD) to the perfection of the metal-barrelled cannon in the mid-thirteenth century. A hundred years later, when the first mention of iron artillery occurs in both Arabic and European sources, China already possessed a sophisticated arsenal of iron and bronze ordnance, and both pictorial and archaeological evidence proves that artillery was used (perhaps for the first time) during the ill-fated second seaborne invasion of Japan in 1281 by the forces of Kublai Khan.

This early use should come as no surprise, for artillery was fully compatible with the traditions of Chinese warfare at sea. From the eighth century AD, at least, Chinese warships had preferred fighting from a distance with projectiles to close-combat and boarding, and war-junks with catapults and trebuchets became the staple of the navy in Sung times. Ship-borne artillery was noted aboard the fleet of the founder of the Ming dynasty, Chu Yuan-chang, in the 1300s, and the Peking military museum possesses a bombard with an inscription indicating that it was cast in the year 1372 for the 'Left naval station' near Nanking. It also bore the number '42' — which suggests that naval guns were by then standard issue. In the early fifteenth century every Imperial warship was required to carry fifty firearms of various sorts, with 7,000 bullets, and this was probably the armament deployed some years later aboard the 7 great expeditions sent into the Indian Ocean under the command of the Muslim admiral Cheng Hoo, which sailed as far as Mogadishu and Aden, and involved the Chinese invasion of Ceylon. Guns were still in use aboard the ships of the Ming navy in the 1520s, and naval artillery helped to defeat a Portuguese flotilla off Tunmen in 1522, delivering the Europeans aboard to imprisonment and, eventually, execution.

But to possess guns is one thing; to use them effectively is quite another.
Eventually, in the 1550s, the Chinese imperial authorities decided that naval artillery was of little value against the pirate bands from Japan, known as wakō (literally: dwarf pirates), who terrorized the coasts of China. According to an illustrated treatise of naval warfare, published in 1564 by a protege of the Chinese Grand Admiral, the pirates had been defeated, not by naval means, but by a combination of three things: intrigue designed to divide the Chinese from the Japanese groups among the invaders; diplomatic pressure on the pirates' supporters in Japan; and overwhelming military assaults on their land bases in China. And even the latter were conducted without firearms: the Ming commanders did not place their trust in muskets or cannon, whether by land or at sea, for they found them too difficult to supply with shot of standard calibre, and too prone to explode when fired. They also dismissed proposals for reinforced, shot-resistant junks on the grounds that they would be too cumbersome; and theydeprecated ship-borne artillery as too inaccurate. Instead, they defeated the wakō in the traditional Chinese way; by concentrating vastly superior numbers of troops armed with bows, lances and swords. And although Chinese war-junks continued to carry some guns, they were only light anti-personnel pieces (plate 20). The principal weapon of the Imperial navy remained, even in the 1630s, the fireship.

So although ship-borne artillery was readily compatible with their naval traditions, the Chinese deliberately rejected it. In Europe, by contrast, the naval gun was adopted in spite of the fact that the standard technique of warfare at sea was ramming and boarding. But it was slow to make its mark. Firepower proved decisive at the battle of Sluys in 1340, the first major engagement of the Hundred Years War; but it was Edward III's archers, pouring their volleys into the crowded French decks, who won the day. Although some English ships may have carried gunpowder weapons, no authentic proof exists that they were used. And when (after the 1360s) credible reports of the use of artillery at sea appear, they clearly refer to anti-personnel rather than to ship-sinking weapons. It is true that numerous fifteenth-century miniatures, which possess great beauty but little sense of proportion or perspective, do show seemingly large firearms in use both from 'fighting tops' on the masts and on the decks (plate 21); but in fact these can have been little more than light breach-loaders (pages 89-90 below). And the recoil from even a modest cannon mounted in the main top would inevitably have produced catastrophe!

But the Atlantic roundship was, at this time, not the principal European warship: that honour had been held, since at least the ninth century AD, by the Mediterranean galley. Thanks to the oars which made her sides vulnerable, the galley had to attack head-on rather than broadside-on and there was no possibility of mounting cannon along the sides. It proved simple, however, to add a small artillery platform at either the stem or the stern. By the middle of the fifteenth century, Christian galleys in the Mediterranean

20 An armed Chinese junk, pictured in the Travels of the Englishman Peter Mundy. The large warship 'A' was observed in the Pearl River, near Canton, in 1637 and Mundy noted that there were 'doories [sic. gunports] in their broadsides, furnish'd with Drakes [sic. light 3-pounders]'. Heavier guns could not be carried because the junk was so 'weaily plancked and timbred'. (Oxford, Bodleian Library, MS. Rawlinson A.315, plate no. 29.)
were already carrying one or two small breech-loaders, on the poop-deck, which were used both against other vessels and against fortifications built close to water. In 1445, a galley sent by the duke of Burgundy to fight the Turks even experimented with a 'great bombard' of iron during operations on the lower Danube; but the gun became overheated and burst. A century later, however, Mediterranean war galleys regularly carried one heavy sixty-pounder bronze cannon, two sixteen-pounders, and usually fifteen lesser guns at the prow and the poop. This gave them impressive firepower: the sixteenth-century sixty-pounders that survive in the Naval Museum of Venice were 175-millimetre calibre weapons, and the records of the Republic's test-firing programme show that they were highly effective up to 640 metres and that their maximum range was no less than three kilometres. The centrel ine gun could be aimed, rather like those of a modern fighter aircraft, by correctly positioning the whole ship, and the massive recoil was absorbed by mounting it on a sledge which was allowed to slide back to the galley's mast (thus facilitating re-loading, if necessary). In the windless, calm waters that prevail in the Mediterranean for much of the summer, such oared fighting ships were easily able to hold their own against any sailing vessel, for they were far more mobile, and their main weapon had a longer range, delivered a much larger shot, and fired on a more dangerous trajectory. Throughout the sixteenth and seventeenth centuries, sailing ships in the Mediterranean were regularly either captured or sunk by well-armed galleys. Even in the eighteenth century, oared fighting ships were still in use in the Baltic, where the skerries which fringed the coasts of Sweden and Finland complicated navigation by sail: the Russians used them for their raids on the Swedish coast in 1739-41 and the Swedes destroyed most of the Russian fleet at Svensksund in 1790 thanks to the imaginative use of heavily gunned galleys.

The real challenge to the galley in the sixteenth-century Mediterranean came not from the round ship, but from the galleass. The Venetian Republic, faced in the 1520s with a massive increase in piratical attacks on her merchant fleet, experimented with different ship types for better defence. In 1529, under the direction of a professor of Greek and with the aid of a rediscovered classical manuscript, the first quinquireme since the fall of the Roman empire was built. Measuring 74 metres long and 11 metres wide, it was possibly the largest wooden ship ever constructed; but unfortunately it was found to be too unwieldy to perform well in action. Then, in about 1540, the first galleass was laid down in the Arsenal: fifty metres long (as against the forty metres of most galleys) and nine metres wide. It was propelled by sails as well as by oars, and was far better armed: the standard galleass carried eight heavy guns at both stem and stern, and seven or more anti-personnel weapons along each side (plate 22). It soon proved its worth. At the battle of Lepanto on 7 October 1571, for example, the Turkish fleet mistook six Venetian galleasses for merchant supply vessels and attacked them in force: they paid a high price for their error - no less than seventy galleys were said to have been sunk by the new warships, 'an incredible thing that only six galleasses should have caused such great destruction, for they had not [hitherto] been tried in the forefront of a naval battle'. The engagement lasted for only four hours, in part because of the excellence of the Spanish infantry (who also served aboard the Venetian vessels), but mainly because of the Christians' decisive superiority in firepower. It has been calculated that they deployed 1,815 guns, against only 750 on the
defeat sparked off several uprisings in Greece and Albania which seemed, for a time, to herald the collapse of Ottoman rule in the peninsula. It appeared to be one of the decisive battles of the century.17

And yet, to the horror of the victors, within seven months the Turks had replaced all their losses and were again able to send a major battlefleet to the West. There were, after all, many boat-builders working around the Mediterranean, men who were already fully experienced in the techniques of galley-construction, possessed the necessary shipyards, and probably also had stocks of raw material to hand. There may also have been some galleys held in reserve in the imperial arsenals of Sinop and Istanbul.18 But most of the new galleys were laid down in the Sultan’s shipyards, where a massive building programme was initiated as soon as news of Lepanto became known, and it even proved possible to imitate the Venetians’ ‘secret weapon’: by April 1572, some 200 galleys and five galleasses were ready for service.19 However, it was more difficult to man them. Each galley required a crew of some 150 oarsmen, each galleass 250, but so many men had been lost at Lepanto that even the Ottoman empire experienced difficulties in replacing them. Conscription was not enough and, since most Christian captives had escaped, a large number of the oarsmen of the 1572 fleet were necessarily convicts.20

The size of the crew required was indeed the galley’s crucial weakness: when troops were added, 400 men might be aboard each vessel. The 400 galleys which clashed at Lepanto therefore probably carried, between them, some 160,000 men, making that battle the largest ever fought in sixteenth-century Europe. There were, as a French galley captain wrote in the seventeenth century, ‘an infinite number of villages that are far from having as large a number of inhabitants’ as a single galley. ‘When every man is at his post, only heads can be seen from prow to stern’.21 Sufficient food and drink for so many men could not be carried for more than a few weeks at a time: galleys, however manoeuvrable, simply could not stay at sea for very long.

But between 1450 and 1650, the emergence of the heavily armed sailing ship transformed the situation. There were several distinct stages in the process. First, in the course of the fifteenth century, the merchant ships of several French, English, Portuguese and Hanseatic port-cities underwent a marked increase in size, but — thanks to improved sail-plans and better design — without a corresponding increase in crew. Then it was discovered that, when equipped with crossbows or handguns, the ships could be defended with fewer men. And from there it was a relatively short step to adding heavier guns to the larger vessels. At first, these were relatively small breech-loading cannons of wrought iron, capable of firing only 4-pounder shot. But just a few of these proved sufficient to keep boarders at bay and, since replacement charges could be prepared in advance, it was found that even a small crew
could maintain a fairly rapid fire from several guns at once, whether mounted in the enormous ‘castles’ at the ship’s bow and stern or along the main deck. From the late fifteenth century, however, two important inventions began to transform the nature of sea warfare. First, muzzle-loading bronze artillery joined wrought-iron breech-loaders aboard ships. Although muzzle-loading took more time and trouble, especially on a ship, the increased strength which resulted from casting the gun in a single piece more than compensated: with a breech-loader, a charge of more than 4 pounds often either burst the barrel or else blew the breechblock out; but a muzzle-loader could deliver an iron ball of 60 pounds or more (page 85 above). Here was a gun that could shoot straight through a ship’s timbers. But the new artillery was too heavy to be carried safely in either the castles or along the main deck: it had to be positioned lower down. Starting (according to tradition) around 1500 in the port of Brest in Brittany, and quickly spreading all over Atlantic Europe, hinged gun-ports were cut into the sides of the larger ships, making it possible to deploy artillery along their entire length on several levels (plate 23).

It took some time before the full implications of these inventions were grasped. For example, the 1,000-ton Henry Grace à Dieu, one of several great ships built or purchased by Henry VIII of England after 1509 to rival those constructed by the kings of France and Scotland, carried 43 heavy and 144 light guns, with a combined weight of over 100 tons (the largest, a 300-millimetre weapon, was almost 6 metres long). But, as contemporary illustrations show, most of these weapons were still used from the castles, to fire down on potential borders, rather than near the waterline to sink ships. The Great Harry, like the Venetian quinquereme, was too cumbersome to be effective and, although she remained in service until 1553 (when she was destroyed by fire), a major rebuilding had to be carried out to ‘slim her down’ in 1540. The Mary Rose, another unwieldy 600-ton, 78-gun warship launched in 1511, suddenly keeled over and sank with all hands in 1545, as she sailed to prevent a French invasion fleet from capturing the Isle of Wight. The history of Scotland’s Great Michael was little better: although built in 1511 at the king’s express request, she proved simply too expensive to operate—perhaps as much as one-half of James IV’s total yearly receipts went on her construction and 10 per cent of his entire annual budget on wages for her crew. In 1539 she was sold to France and, under the name of the Grand Nef d’Écosse, appears to have been left in Brest harbour to rot.

When Henry VIII embarked on his next major round of defence spending in England, after 1538, with the profits gained from the Dissolution of the Monasteries he bought or built ships that were somewhat smaller, with less superstructure (reduced ‘castles’) and more guns amidships. By 1547, the year of Henry’s death, the Royal Navy consisted of fifty-three well-armed warships, with a total displacement of some 10,000 tons, a strength it would not regain for over a century. But it was a navy that England could not afford. Almost at once, without the windfall revenues from secularizing and selling church lands, it began to decline: by 1555, the fleet numbered only thirty vessels, and the great ships of 400 tons and upwards had declined from twelve to three. But then came one of history’s great ironies. In September 1555 Philip of Spain, king consort of England, appeared before the Privy Council to point out that ‘England’s chief defence depends upon the navy being always ready to defend the realm against invasion, so that it is right that the ships should not only be fit for sea but instantly available’. Accordingly, a new generation of ships was added to the Royal Navy—the majority of which took part in the 1588 campaign against the man who had called for their construction!

These ships were both big and durable. The Elizabeth Jonas (began in
1558 as the *Philip* but renamed after Elizabeth’s accession later that year and launched in 1559. It weighed 900 tons and carried sixty-four guns; it continued in service until 1618. The *Lion* of 600 tons, another of Philip and Mary’s ships launched in 1557, carried sixty guns and, thanks to refits in 1582, 1609, 1640 and 1658, was still in service in the days of Samuel Pepys. Naval construction continued apace under Elizabeth so that, by the Armada year, there were three galleons of 800 tons or more, and eleven of 500 tons and upwards. It is not true to say, as so many scholars have done, that the battles in the Channel in 1588 saw an articulated fleet of modern warships pitted against a random assembly of naval fossils. On the contrary, both the oldest and largest warships of the campaign were English; while the most modern men-of-war were the squadrions of Portuguese and Castilian galleons which, in normal times, policed successfully an empire on which the sun never set. For the problems of naval strategy that faced the Iberian powers in the sixteenth century were entirely different from those confronting England. The countries bordering on the North Sea and the Channel, where deep water ports were numerous and the theatre of operations relatively small, could rely upon their huge and unwieldy gun-ships for defence. But Portugal and Spain required men-of-war able to sail to distant oceans, through seas of unparalleled malignance, there both to trade and to destroy the ships of any other power operating without their permission. This called for a highly versatile vessel, and it took years before the small ‘caravels’ of Columbus and Vasco da Gama gave way to the purpose-built, ocean-going warship known as the galleon. Both the design – with its beam-shaped prow, its low lines, and shallow draft – and the very name ‘galleon’ reflect the fact that the new vessels owed much to the galley (plate 24). By the 1520s, when they are first found in Portugal, Spain and Italy, the average model weighed only 250 tons (which was about the same as a large galley); only after 1550 did displacement begin to rise until, by the 1580s, Iberian galleons of 400 to 500 tons were the norm. And yet in the battles with Elizabeth’s navy in July and August 1588, these specialized warships were totally unsuccessful: although most of them managed (unlike many other vessels in the Armada) to return to Spain safely, they seem to have inflicted little or no damage on their adversaries.

There are, of course, many explanations for the defeat of the Spanish Armada. In the first place, the Spaniards were operating far from their bases, in unfamiliar waters, whereas the English could at all times acquire replacements and reinforcements locally, and were fighting in the precise environment for which their ships had been designed. Second, although England’s warships may have been old, they were in good shape. According to the (perhaps over-patriotic?) Navy Board, there was ‘never a one of them that knows what a leak means’. Furthermore, two-thirds of the Queen’s fighting ships had, by 1588, been either built or rebuilt as ‘galleons’ (with thinner lines, more sail and less crew) so that they were able to sail faster and to carry more guns. The thirty-four ships of the Royal Navy, with a total displacement of 1,000 tons and a crew of 6,225, carried 678 guns. In the opinion of most contemporaries, it was the twin advantages of superior speed and firepower that gave England the edge. According to Sir Arthur Gorges, who had been there, the Queen’s ships were able to weave in and out among the Spanish fleet ‘discharging our broadsides of ordnance double for their single, we carrying as good and great artillery as they do and to better proof’. A captured Spanish colonel, Don Diego Pimentel, agreed: to his Dutch interrogators he admitted his surprise at the ability of the English ships ‘to be able to tack four or five times in the time it took us to go about once’, so that they had been able to come close to the Spaniards and fire their guns with maximum effect, and with far greater frequency. Many modern scholars have given their full support to this explanation of Spain’s defeat; yet it by no means fits all of the evidence. In the first place, the Portuguese and Castilian galleons had long been familiar with – and had often successfully employed – the tactic of stand-off gunnery. For instance, the *Instructions* given by King Manuel of Portugal to Pedro
Alvares Cabral in 1500 for his voyage to India specified that, if he met any Muslim ships, 'you are not to come to close quarters with them if you can avoid it, but you are to compel them with your artillery alone to strike sail' so that 'this war may be waged with greater safety, and ... less loss may result to the people of your ships'. The next fleet, sent under the command of Vasco da Gama in 1502, defeated a large Muslim fleet in pitched battle off the Malabar coast by sailing 'on astern of the other in a line', and keeping up rapid artillery fire, the gunners making 'such haste to load again that they recharged the guns with bags of powder which they had ready for this purpose, made to measure so that they could load again very speedily'. The technique was still in use in 1557, for when the English pirate William Townson, and his partners, encountered a Portuguese squadron off Guinea the latter immediately adopted a line-ahead formation and drove off the interlopers with repeated broadsides.

But this is clearly not what Philip II's fleet was doing in 1588. The eight Armada ships whose wrecks have now been investigated beneath the water, all of which were among the most heavily engaged vessels in the expedition, undoubtedly ended the desperate fights in the Channel with substantial stocks of roundshot still in hand – for all the excavated wrecks have produced large quantities of iron shot of 9-pounder size or above. Similarly, the administrative papers concerning the ships that returned safely to Spain usually noted the safe return of large stocks of powder and shot to the naval stores. This strange circumstance is explained by further entries in the same source, which recorded all the occasions on which each gun on most hired ships was fired throughout the campaign. Thus the 22-gun Trinidad de Escazar was recorded as firing a grand total of thirty-five shots on 2 August (16 rounds per gun), twenty-one shots on 4 August (9.96 rounds per gun), and thirty-eight shots during the desperate Gravelines engagement on 8 August (1.7 rounds per gun). The 20-gun Santa Barbara fired twenty-two shots on 31 July (1.1 rounds per gun). Twenty-eight on 1 August (1.4 rounds per gun) and forty-seven on 2 August (2.35 rounds per gun). Finally, over the full period of fighting the Andalusian San Francisco fired 242 rounds from her twenty-one guns, and her two heaviest pieces, full cannons, discharged ten and twelve balls respectively – scarcely one round a day. These figures – and numerous others like them – come nowhere near to accounting for the fifty rounds with which each gun had originally been provided (although they certainly help to explain why the Armada was unable to make any impression on the English fleet).

What, then, went wrong on the Spanish gun decks in the Channel? All the guns were, in accordance with the instructions of the commander-in-chief, the duke of Medina Sidonia, always kept loaded so that, when battle was joined, one salvo was available for immediate use. An operator holding a lighted matchstock beside each gun was the only requirement for the first round. This is exactly how a galley was expected to loose off its close-range cannonade immediately before ramming its foe; in such a situation, there would be neither opportunity nor need for immediate reloading, and so no procedure for it as a battle-drill existed. But in the Channel, the English unchivalrously refused to be rammed or boarded. No doubt, as this became apparent, efforts were made to continue working some of the guns after the first round had been fired, and with the light, short-range breech-loaders this would have presented no problems. The bigger, muzzle-loading pieces, however, could only be recharged at sea in one of two ways. Either they could be brought inboard and the necessary operations carried out within the ship, or they could be let fully run-out and loaded outboard. Now both archival and archaeological evidence reveals that most of the bigger guns aboard the Spanish Armada were mounted upon large two-wheeled carriages, with trails so long that they could have been run back for reloading only with the greatest difficulty. Some carriages were adequate as wide as the deck on which they stood. On the other hand, since outboard recharging required the loader to straddle a hot barrel outside the ship and carry out all the clearing and charging operations from this exposed and difficult position – perhaps under enemy fire – it is unlikely that it would be often attempted with any degree of success. All the available evidence suggests that few of the Armada's ship-killing guns were able to apply a continuous close-range cannonade against the enemy, although this was the only way in which they might have achieved success.

But the English navy did not suffer from this handicap because, for at least half a century, its guns had been mounted on a compact, four-wheeled truck carriage. The ill-fated Mary Rose carried them when she sank in 1545 (plate 25); the squadron sent to expel the Italian invaders from Smerwick in 1580 had them (plate 26); and the race-built galleons designed in the 1570s also used them (plate 24). The evidence suggests that they provided a decisive advantage. Sir Henry Mainwaring's Seaman's dictionary of about 1623 entertained no doubts: 'The fashion of those carriages we use at sea are much better than those of the land,' he wrote. 'Yet the Venetians and Spaniards and diverse others use the other in their shipping'. The design of the English truck carriages meant that the gun muzzles could protrude much further through the gun-ports, and ensured that there was no awkward trail or wide wheels to obstruct the sides and rear. Adequate working space was thus available for the crews to haul their guns back with tackles after firing, and reload inboard before heaving them into place for another round (plate 27). The truck carriage also allowed guns to be traversed and aimed far more easily and accurately in action. Broadside could therefore be delivered consecutively during the course of a fight, the range being dictated by the superior sailing qualities of the English ships.

It is customary to see the campaign of 1588 as causing a tactical revolution
which turned the line ahead and stand-off artillery bombardment into the standard techniques of European naval warfare. But this was not so. In the first place, both tactics had been used in the Indian Ocean almost a century before – and Cabral’s instructions of 1500 (page 94 above) were so precise that clearly they were not new even then. In the second, the lessons of the English victory were slow to be drawn in Europe. In 1591, for example, the textbook of the Italian Eugenio Gentilini, The perfect bombardier, still claimed that ‘to hit the enemy at long distance with artillery cannot be the purpose of a navy; the main object being ramming and boarding’. Even in England, there was no immediate change in warship design. The ‘race-built’ galleons had not been universally acclaimed, and various members of the Navy Board had objected that the removal of the fore- and aft-castles made ‘the majestic ships of the Queen’ look like mere merchantmen – a deep-seated conservatism which helps to explain why some of the great capital ships of 1588 were still in service twenty, thirty, even ninety years later. Admittedly,
the lessons of the Armada campaign were not entirely lost. For instance, the Navy Board Commissioners in 1618 noted that. 

Experience taught how sea-fights in these days come seldom to boarding... but are chiefly performed by the great artillery breaking down masts and yards, tearing raking, and bilging the ships, wherein the great advantage of His Majesty's navy must carefully be maintained by appointing such a proportion of ordnance to each ship as the vessel will bear.

But there is little evidence of this advice being followed. On the contrary, the exploits of the Jacobean navy proved disastrous, largely because its principal warships were too unwieldy to operate outside the Narrow Seas. As the commander of the Cadiz expedition of 1625, Lord Wimbledon, perceptively (if bitterly) commented: 'I find that great shippes (and especiallie the old ones) that are so over loaden with ordnance, are not for an offensive warre, but more fit for a defensive [one] at home'. His flagship, the Anne Royal (which, as the Ark Royal, had also been the English flagship in 1588) was 'rowing and making in the Spanish seas' so badly that they had to put 'much of the ordnance into the hould... So that we are all of opinion that shippes... smaller stronglie built, without carving, are fitter for such journeys'. But again the government would not listen. The fleets sent to relieve La Rochelle in 1627 and 1628 were unequal to their assignment and Charles I's 'Ship Money' fleet, which was originally intended to be built with Spanish subsidies in order to keep the Channel open for Spanish shipping, likewise included veteran warships so massive that they were useless for service elsewhere. The 1,500-ton Sovereign of the Seas, launched as the Stuart flagship in 1637, was even less manoeuvrable than the Armada galleons, and her 104 guns (which weighed over 153 tons) later had to be reduced in number.

It was in fact the Dutch, not the English, who first created a high-seas fleet capable of operating at long range. In their war against Spain, the three principal tasks of the Dutch navy were to protect their merchants at sea, to blockade those ports of the South Netherlands (above all Dunkirk) from which hostile privateers operated, and to intercept the fleets of warships and troop-transports which the Spaniards periodically sent into the North Sea. These were difficult assignments, for the first two required ships that were swift, of shallow draft, and capable of remaining on station for months at a time, while the third called for powerful guns and great strength. Shortly after 1600, eight new 300-ton capital ships were built at Hoorn in North Holland: they were long in relation to their breadth, low in the water, yet shallow in draft. They came to be called frigates, and they soon became the mainstay of the fleet. In 1621 the Dutch navy included nine vessels of 500 tons or more, but by 1629 they had all been phased out of service. The forty-gun, 300-ton frigate had become the standard Dutch warship: only a few, such as the flagship of the Holland squadron, the Aemilia (fifty-six guns, built in 1632), now carried more. With these swift, efficiently armed
vessels, aided by fire ships, in October 1639 the Dutch destroyed a far larger Spanish fleet in the roadstead of the Downs off the Kent coast.40

It was at the Downs that the attack in line ahead was apparently first performed in European waters (plate 28). The Dutch admiral, Maarten Harpertszoon Tromp, led his squadron in among the Spaniards (despite the presence of Charles I's fleet, trying to keep the combatants apart) and sank forty of their fifty-three ships. It was an innovation that Holland's neighbours could not afford to ignore. But before anything could be done, the Civil Wars caused a seven-year hiatus in English warship-building. However, the vessels constructed thereafter were strikingly different from The Sovereign of the Seas and her like: whereas most of the galleons of Elizabeth had been built with a ratio of length to breadth of 2.5:1 and those of Charles I with a ratio of 3:1, the new vessels laid down in 1646-7 were 3.5:1.41

They were indeed frigates. In the course of 1649, the Republican government ordered the construction of no less than seventy-seven vessels of this new design, and in 1651 it congratulated the shipwrights of England 'for their success in contriving and building of frigates'.42

The Republic's fleet, numbering 157 warships, was now expressly ordered to adopt in action the line-ahead formation favoured by the Dutch. The 'Instructions for the better ordering of the fleet in fighting', signed by Generals Blake, Monck and Deane on 29 March 1653, were quite specific:

As soon as they see the General engage, ... then each squadron shall take the best advantage they can to engage with the enemy next unto them; and in order thereto the ships of every squadron shall endeavour to keep in a line with the chief.

Already the Republic was at war with the Dutch and a series of full-scale engagements took place in which the two battleships bombarded each other in parallel lines (much as land forces had been doing for the previous half century). Eventually the Dutch lost—or, in the terse message of Oliver Cromwell to one of their envoys: 'You have appealed to the judgement of heaven. The Lord has declared against you'.43 So in the spring of 1654, after peace had been concluded with the Dutch, England possessed '160 sail of brave ships, well appointed, swimming at sea, and store of land forces, all of which required either to be lessened and laid down, or to be employed in some advantageous design'. After some discussion, the government opted for the latter. Before the year was out, with the aid of capital provided by London merchants, a fleet of thirty-eight ships was dispatched to the West Indies to carve out and defend a British empire in the Caribbean; then in 1656, after war had been declared on Spain, a further forty to fifty warships were maintained in the Mediterranean and in Spanish waters, with perhaps fifty more vessels permanently protecting England's shores.44

Here indeed was a high-seas fleet capable of operating at long-range, on a permanent basis, as an ocean-going force: it was arguably the first in
the French would invade, but I was always of another opinion, for I always said that whilst we had a fleet in being, they would not make the attempt'.

A ‘fleet in being’—that was, perhaps, the key to the naval stalemate in north European waters. With battle fleets of 100 vessels, even prolonged actions might fail to destroy the opponents’ strength sufficiently since (as another defeated admiral, Sir Clowdesley Shovel observed disconsolately in 1690) ‘at sea, if the fleets be near equal, there must be great success to win a great victory; for by the time one is beaten, the other generally is weary’. Even the defeat of the French at La Hogue in 1692 was not decisive. Louis XIV’s navy stood in port after the battle, it is true; but only because his ministers, led by the astute Vauban, convinced him that valuable resources could be saved if the battle fleet were ‘put in moth-balls’. Instead, a few naval bases were heavily fortified and turned into highly effective centres of privateering. For the guerre de course, swift frigates armed with 32-pounder guns were ideal, so France placed all her trust in them—and not without results, for between 1689 and 1697 the French captured some 4,000 enemy vessels. Moreover, with her powerful yet mobile warships she could patrol and protect the sea-lanes to her colonies in America and Asia more effectively than her rivals because the frigate, as Cromwell’s admirals had found, could sail to destinations far beyond the range of the battleship.

Gradually, the same strategic truth dawned upon the other maritime powers of Europe: once the French abandoned fleet actions in favour of commerce raiding, her rivals’ need for battleships diminished, while their own need for frigates grew. Thus although 24 British warships of 90 guns and above were built between 1666 and 1688, only 3 more were launched between then and 1697. Yet the overall size of the navy rose during these years from 173 ships (with 6,930 guns) to 323 ships (with 9,912 guns).

II

The savage and prolonged naval rivalry of the Atlantic states of Europe in the century after 1688 had thus created battle fleets capable, both in number and design, of pursuing strategic objectives far from home. The new ships of the line were able to operate by 1688 in the Caribbean, in the Indian Ocean, and in the Pacific, in order to gain both tactical and strategic superiority. But they were (of course) by no means the first European ships to sail those distant seas. In America, for example, seapower had been acquired by the Westerners from the days of Columbus, since the Amerindian peoples seem to have lacked any specialized warships of their own, whether in the Caribbean or on the inland seas. When, for example, on Lake Texcoco, Cortés and his troops encountered armed canoes in 1521, they simply constructed larger vessels of their own, which they called brigantines and equipped with firearms. Within a matter of hours the lake was theirs, making possible the conquest of the capital, Tenochtitlán. Protecting the riches
of this empire from other European nations proved more difficult, however. For much of the sixteenth century, a fleet of galleons was necessary to escort the convoys of merchantmen plying between Spain and the Caribbean, while dislodging French settlers from Florida in 1565–6 required the dispatch of a major expedition of warships from Spain. But Francis Drake’s sustained piracy in American waters in the 1570s and 80s created a threat far beyond the capacity of the existing forces to resist. On 25 October, 1586, the duke of Medina Sidonia, who was in overall charge of protecting the Indies trade, informed Philip II that, in his opinion, Elizabethan aggression overseas would be more cheaply and more effectively countered by mounting a major seaborne attack on England, the pirates’ base, than by improving the defences of the entire Caribbean. It was not, of course, the duke’s intention that, when his advice was accepted, he should be charged with leading the attack in person; but his strategic perception was undoubtedly correct – after the Armada, as the duke had predicted, no amount of effort expended on strengthening the fleets and fortresses of Spanish America sufficed to exclude interlopers.

The Armada also had important consequences for the defence of the Iberian empires in the Orient. On the one hand, the campaign itself absorbed resources that were earmarked for further expansion – both an attack on Acheh and a plan to build a fort at Mombasa were called off, allegedly because of the need to concentrate all Philip II’s efforts on the campaign against England. On the other, having thus been forced off the offensive, the arrival in the Indian Ocean of first Dutch and then English ships in the 1590s presented the Estado da Índia with a new and intractable problem. The correspondence of the viceroys in Goa was thenceforth dominated by the decrees and threats of os enemigos de Europa in Asian waters.

Portuguese India was particularly vulnerable because it was essentially a trading network rather than a territorial enterprise: it was concerned with distribution rather than with production, and with relations between men rather than with control over land. The first Governor of Portuguese India, Francisco de Almeida, began by governing only his fleet; and even after bases like Goa, Malacca, Diu andOrmuz were conquered, control of the sea-lanes remained vital to the successful operation of the Portuguese system. Until the arrival of the Dutch, this task proved relatively easy. Vasco da Gama destroyed the fleet of Calicut in 1502 with eighteen vessels, of which even the flagship carried only sixteen guns – none of them large. Twenty years later, the sixty ships and six fortresses of the Portuguese in and around the Indian Ocean possessed no more than 1,073 artillery pieces between them. And, even in action, these guns were not always used effectively. At an encounter in 1510 between the 400-ton flagship of Viceroy Afonso de Albuquerque and a large Sumatran merchantman in the Straits of Malacca, for example, the entire Portuguese fleet closed in for the kill and started shooting at her; but this did not affect her in the least, and she went on sailing... The Portuguese ships then shot at her masts... and she dropped her sails. Because she was very tall... our people did not dare to board her, and our artillery did not hurt her at all, for she had four layers of planking on her side, and our biggest cannon would not penetrate more than two.

In the end, after two days and nights of fruitless bombardment, the gallant and resourceful Albuquerque decided to pull off his adversary’s two rudders; only then did she surrender.

Such bully-boy conduct was only possible, of course, because the Sumatran jongs, like all other native shipping in the Indian Ocean, was unprotected by guns. Once Asian vessels began to carry and use artillery, Portuguese domination of the sea-lanes came under serious threat. The rulers of Egypt, to begin with, occasionally managed to send a fleet from the Red Sea to challenge the Portuguese. In 1508 a fleet of six roundships and six large galleys sailed from Suez to Chaul and, together with some Gujarati warships, proceeded to destroy a Portuguese squadron there. But in February 1509 almost all the Portuguese vessels in Indian waters (nineteen of them) manned by almost all the Europeans in India (1,200 men) sailed to Diu and sank most of the Egyptian fleet at anchor. Subsequent attempts by the Ottoman rulers of Egypt to sweep away ‘the ships of the evil-doing Portuguese’ whom had ‘continually been causing damage to [Muslim] merchant ships coming by sea from the land of India’ met with far less success. A fleet sent in 1538 captured Aden (at the entrance to the Red Sea) but was defeated decisively off Diu; a second, in 1552, captured Muscat (at the entrance to the Persian Gulf) but was then badly mauled by the Europeans and forced to retreat; a third, in 1559, never got out of the Persian Gulf. Indeed the latter’s attack on Bahrain island failed so totally that the Ottoman commander had to pay the Portuguese 4,000 scellins in order to be ferried, with his men, back to the mainland.

However, by this time, the disruption caused by the Iberian invasion of Asian waters had been partially contained by other means. In the west, the establishment of three great Islamic states adjoining the Indian Ocean – the Safavids, the Ottomans, and the Mughals – had by the 1550s created governments capable of resisting the Estado da Índia. At the same time, to the east, the Muslim states of Indonesia – especially Acheh – learned to produce great ships with sufficient armament to resist easy capture. There were furious naval encounters in the 1560s in the Red Sea and in the 1570s off Singapore between Portuguese galleons and Achehnese ships equipped (in part) with Turkish guns and troops. Usually, it is true, the Europeans won, but at a terrible cost: in 1562, and 1585 Acheh’s Red Sea carrack was sunk, but took a Portuguese great ship to the bottom with it. After that experience, some direct trade between Sumatra and Egypt by Muslim vessels was performed permitted. At the same time, small warships based on Calicut – referred to in
the Portuguese sources as ‘Malabar pirates’ and in the Muslim chronicles as ‘Islamic freedom fighters’ — developed far better tactics for their light vessels of shallow draft, powered by oars and sails, than they now operated in ‘packs’ and, rather like Mediterranean galleys, used the centreline gun against becalmed merchantmen. In the seventh century, they were so effective that the Mughal port of Surat employed Malabar flottillas for defence against Portuguese attack; and, in the eighteenth, the ‘pirates’ even captured a British Eastindiaman at sea.

It is often argued that the Portuguese empire was lost because of overextension; and its efforts to conquer territory in Mozambique and Ceylon after 1570 have been particularly criticized. But it seems from the documents that these moves, which marked a clear break with the policies of Almeida and Albuquerque, were rather a response to the loss of the trading monopoly created earlier in the century than a prime cause of commercial decline. It was the resurgence of Muslim seapower that provoked the shift towards territorial conquest, and not vice versa. However, the enormous commitment of resources in Ceylon and Mozambique in the years around 1600 certainly facilitated the rise of English and Dutch power in the Indian Ocean. Portugal simply did not have the men, the ships or the guns to conquer Ceylon, keep the Muslim states in check and resist her European enemies; and although the Portuguese merchants in India urged the Lisbon government to suspend the conquests, the missionary establishment was simply not willing to abandon newly won souls to heretics.

So the arrival of the Dutch and the English in Asia tipped an already adverse balance of power even further against the Portuguese. The 1598 were disruptive enough — with fifteen ‘Voyages’ by the Dutch, totalling sixty-five ships, and one by the English — but the pressure became far more intense after the creation of the Dutch United East India Company in 1602. The first fleet it sent comprised fourteen ships, of which nine were of 400 tons or more; the next, sent in 1603 and commanded by Stefan van der Hagen, numbered only ten vessels but was more heavily armed. Van der Hagen’s flagship, the 900-ton Dordrecht, carried six 24-pounder and eighteen 8- or 9-pounder guns, and the Admiral was expressly directed to seek allies in Asia against the Portuguese and to destroy as much Portuguese trade as possible. The fleet of eleven ships sent out in 1605 under Cornelius Matheus was further instructed that the destruction of the Portuguese possessions must come first, even if it meant the neglect of the Company’s own trade for a time. Eventually, by the end of 1609, the Company had spent perhaps 13 million florins (£1.5 million) on the war in Asia (and run up debts worth a further 6 million) in order to establish fortresses or major factories in 13 places, and to send out 1,468 ships to Asia. But the trade of the Portuguese had effectively been ruined; between 1602 and 1619 only 79 ships from Lisbon, some of them very small, reached their destination in India. Fewer

still returned, partly because even the great carracks carried few heavy guns and, ‘As for the gunners, they were mostly artisans, shoemakers, tailors and others who, when the time arrives, know not how to fire a gun’. All the same, it is impossible to exaggerate the disparity between the two sides. The Dutch, after all, made little impression on Portuguese land bases until the 1640s; their attacks on Mozambique, Malacca, and Goa (despite nine costly blockades) all failed. And, even after that, although they captured the Portuguese bases along the coast of Ceylon in the 1650s, they repeatedly failed to conquer the kingdom of Kandy in the interior. Furthermore, their ships were not always invincible: of the forty Dutch vessels sent to the East Indies between 1603 and 1610, nine were lost through war. The English record was little better. On the whole, they left the Iberian bases alone, but even their encounters with Portuguese ships in neutral waters did not always result in victory — as, for example, in the action of 23 December 1612 between two English ships under Thomas Best and four Portuguese galleons off Surat. Tactically, the English were clear winners. They steered straight for the enemy, passed ‘from one to another, and gave them such bangs as maid their verie sides crack; for we neyther of us never shott, but were so neere we could not misse’. In all, the English fired over 600 rounds into the Portuguese who (according to Captain Best) scarcely fired back at all before retiring to lick their wounds like ‘an arnemy of women ... Yf mine eyes had not seen, I could not [have] believed their baseness and cowardlyness’. The English ships were undamaged. Nevertheless, Best’s victory was by no means complete, by no means decisive. His bombardment did not sink any of the galleons; nor did it even drive them off for long. In the end, in January 1613, the continued presence of the Portuguese ships, biding their time until the English made a mistake, forced Best to take his ships off to Indonesia before they were fully laden.

The error made by the Portuguese in India was thus essentially the same as the error made by Philip II’s Armada: they sought to fight as if they were aboard galleys, firing a preliminary salvo before closing in to board. But Best’s smug sarcasm must not blind us to the fact that, outside European waters, a preliminary salvo (“shooting off one piece”) was usually quite enough to compel the surrender of an unarmed merchantman. Recent research has shown that both the privateers of Elizabethan England and the buccaneers of the seventeenth-century Caribbean often carried no more than one or two guns; yet this was perfectly adequate for their prosperous operation. And, except when other European warships were present in the area, the same was usually true in the Indian Ocean. For example, between 7 and 22 April 1612, some months before Captain Best arrived off Surat, six English ships already in the Indian Ocean congregated off the Arabian coast and hijacked, in succession, fifteen passing Muslim ships from India, culminating in the capture of the great 1,000-ton vessel Rabini, which belonged to the
mother of the Mughal emperor. The ship was at first reluctant to anchor, but three warning rounds convinced her master of the need to surrender. The other ships were taken without a shot being fired, and the English, 'having nowe as many shippes as wee could well tell whaht to doe withall', took their prizes to a nearby anchorage and plundered them at will.  

The *Rahimi* was eventually ransomed for £4,000. Here was a prime example of what Professor K. N. Chaudhuri, in his fine study of the English East India Company, has termed 'redistributive enterprise' (and what others might call naked piracy).  

But this is not yet the full story. The vessel, it must be remembered, belonged to the Mughal dowager empress, whose son was the overlord of Surat. Before long, the emperor decreed that, until the cargo was restored, no further English trade at Surat would be permitted. The Honourable East India Company soon came to terms. Then in 1613 the Rahimi was hijacked again, this time by the Portuguese. The enraged emperor at once declared war on the *Estado da índia* and sent his armies to attack several Portuguese bases on his territories. Hostilities continued for two years until the Portuguese, too, restored their ill-gotten gains.  

Similarly, in 1636, the English factory at Surat was seized by the Mughal authorities, and the factors imprisoned and threatened with torture, because English ships - not, in fact, East India Company vessels at all - had plundered some merchants from Surat in the Arabian Sea. The factors were released only when full compensation had been paid.  

For as long as the European powers lacked a military presence in Asia, the native rulers were able to counter the power of Western artillery with the permit and the prison. It is true that the *Rahimi* was armed with some fifteen pieces of artillery, and that the soldiers aboard her carried muskets; but these were merely anti-personnel weapons. Western Indian vessels, which often relied on rope and treenails to hold their planks in place, lacked the strength either to suffer heavy artillery bombardment from without, or to absorb the recoil of large ordnance firing from within. It was considered cheaper and more effective to pay protection money to the Europeans than to invest in new ship-designs and massive armament (which might, after all, fail to save the merchantman's cargo from damage); and to punish any who failed to honour the protection they had sold. The Mughals did not need navies or naval guns.  

Perhaps the maritime history of early modern Japan offers an even clearer example of the advantages of this policy. The crucial influence here appears to have been the abortive invasion of Korea in the 1590s by the forces of the warlord Toyotomi Hideyoshi, who had just completed the unification of Japan. Hideyoshi was of course fully aware of the need to control the seas during the invasion, and he tried (unsuccessfully) to hire two Portuguese galleons to help him. When this failed, he increased the size of his own fleet to 700 vessels, assuming that the Koreans would fight hand-to-hand and be overwhelmed. In fact the invasion force landed at Pusan without meeting any Korean ships, and the Japanese forces began a lightning march north, reaching Seoul within twenty days on 2 May 1592. But the Korean navy was not idle. In May and June, in a series of actions, a small Korean fleet commanded by Yi Sun-sin destroyed several minor Japanese flotillas - in all perhaps seventy-two vessels were sunk. Then on 8 July, in a decisive battle, Admiral Yi destroyed the main enemy fleet in Hansan Bay; and on the following day he defeated a relief expedition sailing up from Japan. There were two main reasons for these victories. In the first place, the defeat of the *wakō* by the Chinese in the 1560s seems to have eliminated numerous experienced Japanese naval personnel who were not replaced. Certainly the sailors aboard the invasion fleet were mostly conscripts provided unwillingly by the lords of Kyushu and Shikoku, who had only recently been conquered by Hideyoshi's armies. The second decisive factor in Admiral Yi's victory was his use of the famous 'turtle ships', about 33 metres long and 8 metres broad, entirely encased in hexagonal metal plates so that they could neither be beached nor holed (plate 29). They were armed with twelve gunports and twenty-two loopholes per side (for small-arms), plus four more ports at each end, together with fire-pots and toxic smoke. Sometimes the turtle-ships came up close, just like a modern torpedo boat, and fired broadsides; sometimes they used their metal ram to hole the enemy, leaving the other warships to close in for the kill. Their armament outweighed that of the Japanese by about 40 to 1.  

But Hideyoshi and his commanders learned fast. The Japanese were not unfamiliar with the idea of proving their ships with iron. In 1578 Oda Nobunaga, another powerful warlord, had deployed on the Inland Sea 'iron ships so arranged that guns could not penetrate them'. Probably they were ordinary ships plated with iron, for they keeled over and sank when the enemy tried to board at one side and everyone rushed over to repel them! Nevertheless, in 1592, Hideyoshi ordered his daimyo to supply him with iron plates, no doubt with the intention of creating ships equal to the turtle squadron. Meanwhile, at Pusan, the surviving Japanese warships took aboard some heavier guns, and clustered beneath the harbour's defences. Even Admiral Yi could not make any impression upon them.  

There was a hiatus in the war between 1593 and 1597; but, when it resumed, the Japanese again failed to win command of the sea. After an initial success in July 1597, their fleet was lured by Yi Sun-sin into a tide-race and destroyed. The war continued for another year but, lacking naval support, the Japanese armies were unable to advance far beyond their base at Pusan. In August 1598 the survivors were ordered home. Yi tried once more to destroy the invaders at sea and, although his turtle ships inflicted heavy losses, the admiral was killed in the mêlée.  

The end of the Korean war, and the death of Hideyoshi the same year,
A Korean Turtle ship. Although one of these remarkable warships was reputedly still afloat in the 1790s, there are few authentic pictures or models of them. This later reconstruction, however, gives some idea of both the compact design and the virtual impossibility of penetrating the hexagonal metal carapace which thwarted all Japanese attacks during the invasion of Korea in the 1590s.

...was soon followed by a period of peace not only in Japan but in the surrounding seas. The wakō did not reappear, and the Korean turtle ships did not go into action again. Instead, a new form of maritime enterprise grew up in Japan: a fleet of large unarmed merchantmen, on average 300 tons each, was built locally. Many were entrusted by their merchant owners to European pilots and (often) European crews. By the 1600s, one or more of these great ships sailed annually to each of nineteen destinations in South-east Asia. They were known as Shuinzen – 'Red-seal ships' – because they were protected only by a passport bearing the shogun's shinmei or red seal (plate 30). They carried no guns at all. At first this seems unnatural; after all, from 1532 onwards, every Portuguese vessel sailing southwards for Asia was required by law to carry artillery, and yet by contrast no Japanese merchantman was allowed by the shogun to arm itself. But that just shows how 'Eurocentric' naval history has become! The Japanese government, like the Mughals, considered it cheaper and more effective to persuade the Europeans to allow the safe passage of their unarmed merchantmen than to invest in expensive new ships with massive armament, and to retaliate for any offence at sea by prohibiting the Europeans' access to Japanese markets.

Until the Shuinzen themselves ceased to trade in the 1630s, the system worked well. When a Red-seal ship arrived at Manila in 1610, for example, in the middle of a sea-battle between the Dutch and the Spaniards, hostilities were suspended while the Japanese neutral sailed serenely through. On the rare occasions when a European ship – almost always Dutch – attacked or plundered a Red-seal vessel, the Japanese aboard made no attempt to defend themselves, but instead returned to Nagasaki and reported the incident to the magistrates. Thereupon all Dutch goods and ships in the port were impounded while the charge was investigated, restitution given, and punishment effected. The Shuinzen may have lacked heavy armament, but they were
protected by legal remedies which were remarkably effective. Anyone who wished for a share of the lucrative Japanese trade was soon compelled to regard the shoguns’ passport as sacrosanct.79

But if the Mughals and the shoguns did not have that direct interest in dominating the sea which might have prompted them to create an offensive fleet, many other Asian states did. Apart from the Samorins of Calicut and their ‘Malabar pirates’, several others powers tried to beat the Europeans at their own game. First, there was Aceh. In the sixteenth century, Sultan Ala al-Din Ri’ayat, who (according to the Portuguese chronicler Diego de Couto) ‘never turned over in his bed without thinking how he could encompass the destruction of Malacca’, tried a frontal attack in 1568; and his son tried again in 1573 and 1575. In 1579, Sultan Iskandar Muda launched yet another amphibious attack led by a flagship (called The Terror of the World) which weighed 2,000 tons. Although captured, along with the rest of the invasion fleet, the great vessel was considered so formidable that the victors sent it back to Europe as a showpiece.80 Shortly afterwards, another maritime power began to challenge European shipping, this time with more success. Sultan Ibn Saif of Oman captured the Portuguese fortified port of Muscat in 1650, and immediately made the galleons sheltering in the harbour into the nucleus of a fleet of his own. New warships were ordered from the shipyards of Surat and Bombay until the Omanis fleet in 1698, numbering twenty-four large ships – and including one 74-gun and two 56-gun frigates – was strong enough to force the surrender of Fort Jesus at Mombasa. Twenty years later, the Omanis also briefly captured Bahrain. Efforts by the Marathas of western India to construct Western-style warships were less successful. In the 1650s, their leader Shivaji created a battlefleet of some twenty ships with the aid of some 300 Portuguese refugees; however, when, in 1659, the latter were all persuaded to desert, the Maratha navy crumbled.81

But these were just minor gadflies compared to the challenge offered to the Europeans by the Chinese pirate king, Cheng Ch’eng-kung, better known in Western sources as Coxiinga. Coxiinga grew up near the Dutch factory at Hirado in southern Japan, where his father was an interpreter for the Europeans. In the 1620s, his father also began to act as a pirate in Dutch service, modifying Chinese junks along European lines, with decks strengthened and adapted to carry heavy artillery and better sail-plans to improve manoeuvrability. Then, after 1644 and the collapse of Ming power before the Ch’ing onslaught, Coxiinga established a powerful army and navy along the coasts of Fukiien, dedicated to restoring the heirs of the Ming. But where the Cheng family commanded only three junks and a force of about 100 pirates in the 1620s, by 1655 Coxiinga commanded some 2,000 warships and well over 100,000 troops, making admirable use of European-style weaponry – whether imitated, captured or purchased.82

The resources that underpinned this powerful military machine were derived from trade, and Coxiinga’s trading network by the 1650s was formidable. It alarmed even the Dutch. ‘He is now the man who can spit much in our face in Eastern waters’ the Dutch Governor-General reported from Batavia in 1654; and the next year he warned that ‘Coxinga has become a terrible thorn in our flesh here’. These sentiments were by no means exaggerated. In 1655 Coxiinga informed the Dutch that he regarded their trade as a threat: ‘Such places as Batavia, Taiwan and Malacca are one inseparable market and I am master of this area. I will never allow you to usurp my position,’ he told them; and in 1657 he sent forty-seven junks to Nagasaki alone, with cargoes that were worth more than twice as much as those of the eight Dutch ships of that year.83 But Coxiinga’s commercial empire had a crucial weakness: it depended upon control of the Fukien coast and its offshore islands. Without them, his ships had no access either to the Chinese luxuries he exported or to the Chinese supplies on which his fleet and men depended. In 1656–8 his armies advanced triumphantly to the Yangtze, reclaiming almost all of southeast China for the Ming; but in 1659 his attempt to take the southern capital of Nanking failed disastrously, and the Ch’ing forces rolled forward to the coast of Fukien. The Ch’ing had eventually chosen to adopt the policies used against the seafaring a century before: with irresistible force they subjugated the land bases of an adversary whom they could not defeat at sea. But Coxiinga was resourceful. Early in 1661 he decided to shift his headquarters to the largest of the offshore islands: Taiwan.

Taiwan (or Formosa), however, was fast coming under European control. The Spaniards maintained forts in the north between 1626 and 1642, and the Dutch developed a colony around Fort Zeelandia in the southwest (on the site of modern Tainan) after 1624. By 1660, thanks to the labour of perhaps 50,000 mainland Chinese, whose immigration was encouraged by the Dutch, Taiwan had become one of the most prosperous parts of the Dutch overseas empire. But the colony was defended by only two small fortresses and, in April 1661, Coxiinga led a major expedition to the island and called on the Dutch to surrender: he claimed that they had only been allowed to trade there under licence from the Ming, and that this licence he now hereby revoked. The Dutch, not surprisingly, rejected this line of argument and Fort Zeelandia was blockaded. After a nine-month siege, in which 28 Western artillery pieces were deployed by Coxiinga, it fell; and Taiwan was organized as an ‘imperial prefecture’ under Ming rule.84 Envoy demands of tribute were now sent out to the governor of the Philippines, in preparation for further expansion. Since there were less than 600 Spanish soldiers in Manila, and scarcely more in the rest of the archipelago, the governor panicked and ordered both the withdrawal of all troops from the southern island of Mindanao and the massacre of all Chinese residents in the vicinity of his capital.85 But in the event Manila was saved, in June 1662
when death put an end to Coxinga's remarkable career. He was just thirty-seven.  
Although Coxinga's son carried on resistance for another twenty years, it was a hopeless task. Taiwan was not Fukien; it lacked the food supplies, the population and the shipbuilding facilities to sustain resistance to the Ch'ing on the mainland, and thereby to preserve access to the Chinese luxury goods essential for trade. Gradually, the Ch'ing built up a navy of their own and, assisted from time to time by the Dutch, they began to challenge the Cheng forces. Coxinga's son suffered a catastrophic naval defeat in 1681, and Taiwan surrendered in 1683. The Europeans could at least breathe again and the China Sea came back under the traditional system of Imperial control for the next 150 years. The equilibrium established in the later seventeenth century, with the Europeans ruling the waves around America, Africa and South Asia, but not in the Far East, was to endure until the Industrial Revolution, coupled with the conquest of much of India, created the resources that could 'open' East Asia by force in the nineteenth century and turn Western maritime superiority into global hegemony.
spoke in December 1783 in a debate in the British House of Commons on Fox's India Bill, he interrupted his tirade on the injustices and humiliations inflicted upon the Mughal emperor by officers of the Honourable East India Company to observe:

It is impossible, Mr Speaker, not to pause here for a moment to reflect on the inconsistency of human greatness and the stupendous revolutions that have happened in our age of wonders. Could it be believed, when I entered into existence or when you, a younger man, were born, that on this day, in this House, we should be employed in discussing the conduct of those British subjects who had disposed of the power and person of the Grand Mogul?¹

No, indeed. In 1727, the year of Burke's birth, it had been unimaginable, for the Europeans in India were still confined to a handful of fortresses and factories huddled around the coasts of the subcontinent.

It used to be fashionable to attribute the rapid transformation of this situation either to the innate moral superiority of the White Man, or to the added strength afforded him by the Industrial Revolution. But unfortunately there is little evidence that Britons were more virtuous in 1800 (when they held much of India in their power) than in 1727 (when they held very little) or in 1600 (when they held none at all); while proof that the factory system played a major role in conquering the non-Western world before the nineteenth century is either ambiguous or absent. Although the Machine Age helps to explain how the Europeans extended their control over the total land area of the globe from 35 per cent in 1800 to 84 per cent in 1914, it cannot explain how they managed to acquire that initial 35 per cent.²

By 1800, white colonists ruled all of Siberia, large parts of America and India, several enclaves in Southeast Asia, and a few outposts along the coasts of Africa; but in East Asia, by contrast, they had still scarcely made any impact. These striking differences can only be understood if the 'Rise of the West' is broken down into a number of distinct geographical and chronological components.

I

By 1650 the West had already achieved military mastery in four separate areas: Central and Northeast America; Siberia; some coastal areas of sub-

31 (opposite) 'Tipu Sultan's chess set', discovered in his ruined palace when the British army conquered Mysore in the 1790s, bears silent witness to the superiority of the forces of the English East India Company, whose arrogant officers (with their tricorn hats) ride on elephants and command sepoys 'pawns' armed with muskets. The men of Mysore, by contrast, are armed only with swords. The chessmen from Seringapatam, along with other plunder taken, were sent back to the Company's headquarters in London, whence they were transferred to the India Museum and finally (when that was dissolved) to the Victoria and Albert Museum. (London, Victoria and Albert Museum, I.M. 42–1910.)
Saharan Africa; and the islands of Southeast Asia. Different as these regions, and their inhabitants, undoubtedly were, their experience of the European invaders was, in one crucial respect, identical: the white men, they found, fought dirty and (what was worse) fought to kill. Thus the Narragansett Indians of New England strongly disapproved of the colonists’ way of making war. ‘It was too furious,’ one brave told an English captain in 1638, ‘and [it] slays too many men’. The captain did not deny it. The Indians, he speculated, ‘might fight eight years and not kill seven men’. Roger Williams, a colonial governor, likewise admitted that the Indians’ fighting was far more bloody and devouring than the cruel wars of Europe’. Meanwhile, on the other side of the world, the peoples of Indonesia were equally appalled by the all-destructive fury of European warfare. The men of Java, for example, were ‘very loth to fight if they can choose’. According to Edmund Scott, who lived among them between 1603 and 1606, the reason was simple: they say... their wealth lyeth altogether in slaves; so that, if their slaves be killed, they are beggared.5

Mr Scott had noted a vital and unusual feature of military organization in Southeast Asia which was shared (though he probably did not know it) with America and sub-Saharan Africa: native wars in these areas were almost always fought to enslave enemies rather than to exterminate them. In Guinea, according to an English visitor in 1788, the tribal chiefs freely admitted that the sole object of their wars was to procure slaves, as they could not obtain European goods without slaves, and they could not get slaves without fighting for them.6 On the Slave Coast and the Gold Coast, the same pattern of conflict had been noted almost three centuries before: wars were fought to control labour, not land; to gain men, not territory.8 Of course there were exceptions. Some Amerindian tribes, such as the Algonquin, tortured their defeated enemies to death in an elaborate ritual; the Zuils in the nineteenth century killed their enemies indiscriminately; and the Igorots of central Luzon in the Philippines remained, until modern times, more interested in collecting heads than slaves. Conversely, the Europeans, for their part, sometimes enslaved defeated enemies. Thus in the 1650s, the survivors of the Scottish armies captured by the English were condemned to permanent servitude (usually in Barbados, though sometimes at home: the members of a parliamentary delegation sent to congratulate Oliver Cromwell on his victory at Worcester were each given a horse and two Scotsmen by the Lord General ‘for a present’ to do with as they pleased).10 But the Scots were regarded as rebels and were treated accordingly; and, even in the case of this and other civil conflicts, the aim of making war in Europe was never to secure slaves, as it was in the non-European areas under consideration.

Another distinctive common feature of these regions lay in their settlement patterns. In America, although the Aztec and Inca empires possessed some walled cities, the less civilized peoples to the north and south of them did not. This dearly, of course, facilitated the initial conquest, because the natives lacked defensible bases to fall back on; but it complicated consolidation. As Increase Mather of New England complained in 1675: ‘Every swamp is a castle to them, knowing where to find us; but we know not where to find them!’ And there are innumerable examples of colonial soldiers marching out with drums beating and colours unfurled in order to destroy an Indian ‘town’— only to find it gone. The logic of Western superiority in fixed encounters had been thoroughly digested by the Indians: after their costly initial defeats, they were scrupulously careful to avoid pitched battles— much to the fury of the Europeans—because they always lost them. ‘They doe acts of hostility without proclaiming war; they don’t appear openly in the field to bid us battle’, was the lament of another itinerant New England preacher.11 Only gradually did the Europeans recognize that the only way to win was to adopt those same guerilla methods. The Serious conflict of 1675 in New England, known as King Philip’s War, only ended when the colonists followed the advice of Benjamin Church and fought in small units, armed with hatchets, dogs and knives as well as firearms, which operated in open formation rather than in lines or columns.12

But the Indians of New England were also learning fast. From the 1640s they managed to acquire an adequate supply of guns from the French, the English and (until the collapse of New Netherland in 1664) the Dutch; and they used them to deadly effect—soon realizing that a musket ball travelled with more force, and faster, than an arrow, and was less likely to be deflected by leaves or undergrowth. Furthermore, the Narragansetts in King Philip’s War took refuge in the ‘Great Swamp’ behind the walls and bastions of a European-style fortress which claimed the lives of seventy colonists before it was taken. In the end the native Americans lost ground because their numbers dwindled throughout the seventeenth century (largely thanks to the inroads of European diseases), while those of the Westerners (largely thanks to immigration) relentlessly increased.13

Further south, the European colonists triumphed more rapidly. Indeed the vast, centrally organized empires ruled by the Aztecs and the Incas collapsed before the Iberian onslaught with a speed and finality that has few parallels: the former in 1519-21, to a force of some 2000 Spaniards (together with 14 cannons and only 16 horses) under Hernán Cortés; the latter in 1531-3, to only 168 Europeans (together with 4 guns and 67 horses) under Francisco Pizarro.14 Naturally, such small forces would have achieved little without the divisions that paralyzed their enemies—both Cortés and Pizarro entered realms virtually in a state of civil war—yet they represented relatively large military concentrations by the standards of early colonial warfare. Areas without a well-organized central government were mostly brought under European control by ‘bands’ of under one hundred mounted warriors who killed or enslaved the Indians and plundered or destroyed their possessions.
Admittedly, on Mexico’s northern frontier, against the tribes of the Great Plains which had acquired the horse (but not yet the gun), the Spaniards eventually had to build blockhouses and forts along strategic roads and near vulnerable settlements. But to the south, in Chile, forts were backed up by terrorism. In what must rank as the first manual of guerrilla warfare ever published – The armed forces and description of the Indies (Madrid, 1590) – Captain Bernardo de Vargas Machuca dismissed as irrelevant the entire pattern of European warfare, with its hierarchical tactical units, linear formations and permanent garrisons. Instead he advocated for the Americas the creation of commando groups to carry out search-and-destroy missions deep within enemy territory for up to two years at a time. The good leader, according to Vargas Machuca (who had a lifetime of experience to draw on), knew as much about planting survival crops and curing tropical ulcers as about laying ambushes and mounting surprise attacks. And, thanks to the adoption of native methods, the colonial frontier in Chile was steadily consolidated, and warfare there became ‘nothing but a manhunt’ (in the phrase of a Jesuit contemporary) in which the settlers hunted down recalcitrant Indians with mastiffs and knives.

The situation in Siberia, Southeast Asia and sub-Saharan Africa was not dissimilar. For most of the time, the Westerners held a decisive advantage thanks to their mastery of the gun. The Cossacks who crossed the Urals into Siberia in the 1580s made excellent use of both firearms and forts to expand eastwards, reaching the Pacific by the 1630s in their headlong search for furs. But their rapid progress was due also to the relative absence of concerted opposition: the native population of Siberia at the time was, after all, probably less than 200,000. In this respect, Black Africa was very different. The Ottoman-trained Moroccan musketeers who crossed the Sahara in 1590–1 to attack the empire of Songhai were faced by numerous and determined adversaries, while the Portuguese who invaded the kingdom of Kongo in the 1660s were opposed by troops armed with Western muskets and reinforced by twenty-nine European renegades. But, nonetheless, the invaders triumphed: after the battles of Tondibi (1591) and Ambula (1665), respectively, the states of Songhai and Kongo ceased to exist.

However, it is misleading to relate the entire history of European expansion in Africa to the presence or absence of firearms. Until the machine-gun, Western armament may have proved adequate for winning battles, but it could seldom win wars. Until the nineteenth century, the Europeans remained largely confined to their numerous forts around the coasts. In the east, attempts by the Portuguese to bring the upper Zambezi area under their control repeatedly failed, because the natives with their assegais were normally able to destroy the small groups of Portuguese musketeers as soon as they strayed outside their few fortified bases; while on the Swahili coast the Muslim princes always seemed able to secure copious firearms and ammunition from the Turks. In 1631 the sultan of Mombasa even captured the imposing Fort Jesus, whose bastions had long overlooked the town. Meanwhile, further west, some native rulers proved able to amass Western weapons on an impressive scale, especially after the 1650s, when the Dutch began a direct exchange of guns for slaves. Some 8,000 muskets were sent to the Gold Coast for trade in the three years following July 1658, for example, exchanged at the rate of twelve per slave; whilst a century later, the total number of firearms exported every year was around 400,000, exchanged at the rate of 4, 5 or 6 per slave. And yet, in most areas, this inflow of Western technology scarcely affected most African military techniques. As late as 1821 an English officer in Nigeria who observed the Yoruba at war noted that the native troops in battle still ‘spread themselves out anyhow into open order, and skirmish away until their ammunition is exhausted, upon which they return to replenish’. He added that ‘though thousands of rounds be fired, the killed may be counted by units and the wounded by tens’. Tactically these would clearly prove ineffective against highly trained European forces. But Black Africa did not import guns for this purpose. Its wars continued to be fought for slaves, not lands, and the irrelevance of musketry was a consequence of operations aimed at securing fit and healthy slaves: obvious. Smoothbore weapons were far too inaccurate to be used with precision to wound rather than to kill; and, in any case, the injuries inflicted by lead shot, however slight, often smashed bones and created wounds that turned gangrenous and caused death. In the eighteenth century, the use of percussion rather than bullets overcame this problem in part – which perhaps explains the dramatic increase in musket imports – but this did nothing to facilitate the adoption of Western methods of musketry in warfare, for guns simply did not fit into most African military traditions at all.

It was much the same story in the Indonesian archipelago. Sultan Iskandar Muda of Aceh, for example, had by 1620 accumulated some 2,000 artillery pieces from various Ottoman and European sources. But it led nowhere: the guns proved inferior in action against the Portuguese and almost all were lost at the unsuccessful siege of Malacca in 1629. In reality, firearms never fully replaced Aceh’s 900 war-elephants as the front line of defence; and such cannon as remained after 1629 were reserved for ceremonial purposes. In part this victory of tradition over innovation is explained, as in America, by the relative infrequency of walled towns. Indeed, in some cases, the boundary between town and country could be hard to find. A French visitor to the capital of Aceh in the 1620s claimed that it was despised by most Europeans ‘because it is a town undefended by any wall, resembling more an open village in Normandy than a city.’

In these areas, naturally, siege warfare was a new experience. Since wars had previously been fought to secure slaves or tribute, rather than to annex more territory or acquire new specific strategic bases, the best defence against
attack was either immediate surrender (when the enemy appeared in overwhelming strength) or temporary flight (at all other times). Thus the last Muslim ruler of the thriving port-city of Malacca was not unculy alarmed by the arrival of a small Portuguese squadron in 1511. After some resistance, he and his men withdrew inland 'a day's journey' thinking (according to the Commentaries of Bras de Albuquerque) that the Portuguese 'simply meant to rob the city and then leave it and sail away with the spoil'. But instead, they built the powerful fort known as A Famosa, constructed (typically) on the ruins of the Great Mosque with stones gathered from the sacred hill where the sultan's ancestors lay buried. Eventually the walls of Portuguese Malacca stretched for two kilometres and withstood some ten sieges. One of these, in 1529, was undertaken on a heroic scale: the sultan of Aceh (as already noted) led a besieging force of 20,000, supported by 236 boats and artillery. They erected siege works around Malacca so well that, according to a Portuguese account, 'not even the Romans could have made such works stronger or more quickly' (plate 32). But it was not enough to secure victory — on the contrary, the sultan eventually lost 19,000 men and his two senior commanders, as well as most of the ships and guns. In the same year, an equally formidable siege was begun by the ruler of Mataram against the Dutch fortified port of Batavia, which the sultan correctly identified as a 'thorn in the foot of Java' that had to be 'plucked out, for fear the whole body should be endangered'. The sultan's forces, like the troops of Aceh, managed to dig trenches in the European fashion, but they made no impression against the massive moat, wall and bastions of the new Dutch settlement.

The Europeans erected many other fortifications in Southeast Asia: numerous small citadels in the 'Spice Islands' (as at Ternate, Tidore or Ambonina) and the Philippines; Fort Zeelandia on Taiwan; the Monte fortress in Macao; defensible factories in other places — Ayuthia, Banten, Pegu. But there was only one other fully fortified city to compare with Batavia and Malacca: Manila in the Philippines. Shortly before the arrival of the Spaniards in 1565, Muslims from Borneo and the Moluccas had introduced fortifications to the archipelago. They also imported Chinese firearms, founded bronze artillery and manufactured 'gunpowder and other munitions'. Although only one fort (near Puerta Galera on Mindoro island) was built of stone, and although the muskets were used 'more to frighten than to kill', the Spaniards took no chances. On the site of the Muslim stockade at Manila they built massive defences that defied all assaults for over two centuries. The citadel of Santiago itself was not much bigger than other forts (such as San Pedro at Cebu); but it was connected to the vast stone wall, three metres thick and studded with bastions, which surrounded the Spanish city (known as Intramuros — figure 5) and dominated the finest natural harbour in East Asia.

Impressed — or intimidated — by these developments, a few local rulers began to follow the European example: Banten, Pati, Japura and Surabaya.
all acquired brick or stone walls in the sixteenth century; the sultans of Makassar (in south Sulawesi) built a brick wall and three redoubts around their capital in the mid-seventeenth century. But in vain: the keys to the long-distance trade of East Asia remained in European hands—Manila for the trans-Pacific link with America; Malacca and Batavia for commerce with India and beyond. All three quickly acquired large populations of both natives and Chinese, but they remained in Western hands (albeit not always in the same Western hands) until 1942; and with the wealth conferred by their possession, the Europeans could exercise a maritime hegemony over all other major ports in the region and prevent any rival state from mounting an effective challenge. They were also ideally placed to use the resources extracted from the area to extend that hegemony wherever an opportunity presented itself. Increasingly, their gaze was directed towards the territories, and the riches, of the Muslim rulers of India, Persia and the Levant.

II

Slaves also played an important role in determining the Muslim response to Europe’s military challenge, for they were likewise central to Islamic warfare. In the early ninth century the Muslim states of North Africa, Spain and Egypt began to use slave soldiers to defend themselves; by the middle of the century, the Caliphs of Baghdad had followed suit; and the practice soon spread further. But the slave soldiers were not kidnapped and conscripted as adults; instead they were recruited while still children (often as a form of tribute paid by non-Muslims to their conquerors) and brought up in the ruler’s household with his own children, so that they learned the ways of Islam as well as the art of war. The Mamluks of Egypt, mostly recruited in the Crimea, and the Ottoman Janissaries, mainly recruited in the Balkans, are merely the best known examples of these elite slave warriors. They were part of a military system that was unique to the world of Islam. Even the Muslim states of Indonesia had them: in the early seventeenth century the sultans of Aceh were served by 500 royal slaves born abroad and trained in warfare since their youth. And although the Islamic states of India placed less reliance on slave soldiers, in compensation the sultans of

5 The growth of Intramuros (Manila) the Philippines. When the Spaniards under Legazpi first sailed into Manila Bay in 1571, there was only a bamboo stockade at the mouth of the Pasig river to defend the numerous small communities spread over the plain beyond. The conquerors soon expanded the fort—which they renamed Santiago (St. James)—first in wood and then (after 1585) in stone, and surrounded the settlement which rapidly developed around it with a stockade. By the early seventeenth century, the Spanish town was encircled by a chain of bastions and walls as powerful as any in Europe, and Manila became by far the largest European city in Asia.
The Deccan made extensive use in the fifteenth and sixteenth centuries of foreign mercenaries, particularly those from the Ottoman empire and Persia (referred to in the Portuguese records as a gente branca [white men], because they looked pale in comparison with the native Indians). The character of Islamic warfare was thus consistent and clear: the core of every major army was composed of men lacking any local ties, devoted entirely to fulfilling their government's wishes, and fighting in the traditional manner. It was not a system that necessarily favoured strategic or tactical innovation. In the memorable (though perhaps overstated) phrase of a historian of Islam: 'Mamluks were not supposed to think, but to ride horses; they were designed to be not a military elite, but military automata'. And in 1577 the imperious knights of the Mamluk army - who tolerated the use of firearms for sieges but refused to deploy them in battle - were overthrown by the slave soldiers of the Ottoman Turks, whose commanders lacked such high principles.

The Ottoman army, on the other hand, appears to have adopted and mastered Western military technology with remarkable speed and thoroughness. Handguns, field guns and siege guns were all rapidly developed by the Turks; advanced siege techniques of both offence and defence were evident from the 1530s; and for a century and a half following this, the Turks were clearly equal to all but the largest forces that the West could throw against them. And yet in three important respects the military revolution was imperfectly practiced by Europe's most dangerous neighbour. First, despite its abundant human and natural resources, and the services of some 'renegade' European experts, in 1602 the Turkish commander in Hungary complained that his troops could no longer match the firepower of their Christian adversaries. 'In the field or during a siege we are in a distressed position, because the greater part of the enemy forces are infantry armed with muskets, while the majority of our forces are horsemen, and we have very few specialists armed with muskets.' Western improvements in volley fire and the multiplication of field guns (p. 13 above) widened the gap. This proved particularly important in the Hungarian campaigns between 1583 and 1697, where fifteen major battles occurred. The well-equipped Christians repeatedly defeated their Turkish adversaries, starting with the striking victory scored by the Christian relief army, its field artillery at the ready, against the Turkish forces besieging Vienna. But the Turkish defeat before Vienna resulted from other factors, the chief of which was the failure to fortify their siegeworks sufficiently.

In the West to build two sets of siege-works: one against the beleaguered town, the second around the siegeworks to guard against any attempt at relief (plate 33). That the Turks did not trouble with this elementary precaution in 1683 may have been mere carelessness by their commander on that occasion, the ill-fated Grand Vizier Black Mustafa; but it fits in with other evidence that by the later seventeenth century Ottoman troops had become expert imitators, but poor innovators.

Contemporaries began to note that, although Turkish craftsmen could copy any new Western weapon that they found on a battlefield or that a renegade brought to them, it usually took them a long time; and that, even then, they only seemed able to deploy them within the traditional military framework. The Turks never learned to change their thick columns to thin lines in pitched battle, just as they never fully mastered the complexities of siege warfare.
Even in the late eighteenth century, their Austrian opponents noted that the Turkish army still fought exactly as it had done ‘in the days of Suleiman the Magnificent’, two hundred years before. The Maréchal de Saxe in 1752 offered the following explanation: 

It is hard for one nation to learn from another, either from pride, idleness or stupidity. Inventions take a long time to be accepted (and sometimes, even though everyone accepts their usefulness, in spite of everything they are abandoned in favour of tradition and routine). . . . The Turks today are in this situation. It is not valour, numbers or wealth that they lack; it is order, discipline and technique.

The more the European forces improved these qualities, the greater their superiority over Islamic armies, until the great victory of Napoleon Bonaparte at the battle of the Pyramids in 1798 heralded the opening of the entire Levant to Western exploitation. But there was also a third source of Ottoman inadequacy in the military sphere: metallurgical inferiority. There are two sorts of evidence for this phenomenon. Contemporary sources, on the one hand, almost invariably claimed that arms and armour taken from Islamic forces were of no use to Westerners. Thus, after the victory at Lepanto in 1571, some 223 bronze guns were captured by the Venetians alone, but almost all were melted down and recast (with reinforcement) because, according to the Council of Ten, ‘the metal is of such poor quality’. That is, Ottoman naval artillery was found to be too brittle for safe and effective use. This was apparently not mere chauvinism, for it is supported by a recent chemical analysis of the composition of some other Muslim weapons and armour from the Middle East which showed that Western iron and steel was also notably stronger than the Islamic equivalents. Admittedly the sample submitted to analysis was somewhat small – since few museums will consent to the mutilation of their exhibits in the cause of science – but the results were both consistent and convincing.

Much the same technological inferiority was reported from India. Artillery had been in use in the north of the subcontinent from about 1440 and in the Deccan from about 1470 and yet, in the late eighteenth century, the Europeans still considered all ‘country’ artillery (as they called it) to be unserviceable for their needs. Although the native rulers had plenty of guns, these were found to be poorly cast (even in the eighteenth century, some Indian guns were still made of iron strips tied together with metal bands), poorly maintained, and too heavy to move. According to an Indian writer in the 1780s, the native artillery was as ‘cumbersome, ill-mounted and ill-served as was the artillery of Europe three hundred years ago’. Many European sources bear him out. A report on the copious brass ordnance of the pro-British nawab of Oudh in 1777, for example, ruled ninety per cent of the guns to be unfit for service, due either to metal fatigue or to rotten carriages; while the artillery captured from Tipu Sultan of Mysore in the 1790s was likewise reckoned by Sir Arthur Wellesley, later duke of Wellington, to be suitable only for scrap. It was much the same with ‘country’ small arms, which were normally of limited usefulness, either because they were out quickly and could not easily be replaced; or because they did not conform to a single size, so that the shot often failed to fit the barrel, or because they had a shorter range than European muskets.

Before the eighteenth century, however, the Europeans were not always so contemptuous. As the Portuguese in India never tired of pointing out, Asia was not like America: adversaries there were armed with firearms and steel swords, not with wooden clubs and obsidian knives. It was simply not possible for 168 men with 67 horses to destroy the Mughal empire, as Pizarro and his Spanish companions had brought down the Incas, for the Mughal army numbered over a million men, many of them armed with muskets. Moreover the Indian rulers (including the Mughals) were often advised by foreign experts – at first by Turks (particularly among the Muslim rulers) but later also by Europeans. As early as 1499, two Portuguese deserters from Vasco da Gama’s fleet in order to serve native rulers for higher wages, and the number of ‘renegades’ remained high throughout the sixteenth century – two Milanese gunfounders to Calicut in 1525; four Venetians to Malabar in 1537; and so on. After the arrival of other, rival European groups in South Asia in the seventeenth century, this trickle of Western weaponry, and of the experts to use them, became a flood. Some firearms were captured or confiscates; but most seem to have changed hands as a present, designed to win or keep a friendship that seemed in danger of wavering. Thus in 1663 the Dutch East India Company had to lend the nawab of the Carnatic four bronze field-guns for his next campaign, and the Portuguese on the Malabar coast regularly supplied their native allies with presents of artillery munitions and gunners (plate 34). Most of the European military personnel in Indian service, by contrast, continued to come independently and as individuals. Willem Verstegen, for example, a member of the Dutch Council in Batavia on his way home to Holland, entered the service of Prince Dara, one of the claimants to the Mughal throne, in 1658. There he met Niccolo Manucci, an Italian stranded in Delhi (by the death of his itinerant patron) who was already earning his living in Prince Dara’s service along with perhaps 200 other Europeans and Turks.

But, in spite of all the efforts of these foreign experts, Dara lost every battle that he fought and was at length captured and executed by his rival, Aurangzebe, who eventually became emperor and took most of the Europeans into his service. But Aurangzebe, too, seems to have derived little direct benefit from their presence. There are two obvious explanations for this.
like their predecessors, with the brutal and furious deeds of the fidalgos in the Far East. Attacks were conducted like guerilla actions, with all the reckless indiscipline of the street gang, because, for the fidalgos too, man-to-man duels were seen as the highest form of combat. It is true that, in the early seventeenth century, the Portuguese Crown tried to introduce European organization and discipline into its colonial units; but it met with little success. The Crown likewise tried to introduce better weaponry for its overseas forces but, here too, success was limited: spare guns, powder and shot were simply not to be had. Although successive viceroys tried to manufacture their own—powder in Goa, cannon in Macao—hardly a year passed without the officers of the *Estado da Índia* pleading with the Lisbon government for the urgent dispatch of munitions from home. As for the numerous weapons sent by the Dutch, English and other East India companies for trade in the Orient, quality and reliability were seldom high: indeed some had a special category known as ‘trade guns’ which were (and long remained) far below the standard required for the European market.

So there were good reasons why the European military revolution in field warfare failed to insipire imitation in early modern India; but the case for siege warfare at first sight seems different. Here, the superiority of Western techniques of both offence and defence was proved time and again, even against the most powerful adversaries – as with, for example, the sultan of Ahmadnagar’s siege of Portuguese Chaul in 1571. No fewer than 140,000 Indian troops were pitted against no more than 7,000 European defenders, whose chances of relief were diminished by the simultaneous attack of other Muslim rulers against several other outposts of the *Estado da Índia*. The odds seemed impossible: the garrison held a perimeter of no more than 600 by 450 metres, covered by improvised walls and bastions and ill-protected by guns. Not surprisingly, the besiegers steadily took all the outworks until at last, after six months, they were close enough to launch a full-scale assault. But it was beaten back and, in the furious counter-attack that followed, the Portuguese captured or spiked all the enemy’s artillery. The siege was over.

As in Africa and Southeast Asia, remarkably few European strongholds in India fell to a native siege. Yet they fell easily enough to other Europeans after 1600. The Portuguese forts in Ceylon and on the Malabar coast, for example, all resisted numerous attacks by various native rulers; but every one of them surrendered between 1638 and 1663 to the Dutch. The Dutch, however, fortified their gains on a far more impressive scale: the walls of Galle, with twelve bastions (some of them thirty metres thick), ran for almost two kilometres; those of Colombo, with eight, and those of Negapatam, with twelve, were larger still. They could resist even a full European siege.

It may at first sight seem curious that, despite these impressive examples, the native rulers of India and Ceylon never tried to imitate the *trace italienne*. 

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34 Europeans aim Indian guns in this unfinished Mughal miniature from the early eighteenth century. It purports to show Al-ad-din’s siege of the fortress of Rahambar in 1601, but the uniform battery of guns and the presence of a European dressed in black clearly indicate a date four centuries later, when Western gunnery experts regularly supervised the artillery parks of Indian rulers.

In the first place, as in Southeast Asia, field artillery and musketry volleys simply did not fit easily into local traditions of warfare. As Manucci perceptively observed of a battle between Dara and Aurangzebe in 1658:

Be it known to the reader that these two armies were not ordered in the disposition obtaining in Europe. But one division was close to another, as the trees of a pinewood ... I saw in this action, as in so many others where I was afterwards present, that the only soldiers who fought were those well to the front. Of those more to the rear, although holding their broad swords in their hands, the Moguls did nothing but shout *bakshish, bakshish* and the Indians *Mar, mar* – ‘Kill, kill’. If those in front advanced, those behind followed the example, and if the former retired, the others fled – a custom of Hindustan quite contrary to that of Europe.

Manucci was right: Indian armies may have been huge but they remained, essentially, aggregations of individual heroic warriors. Their principal ambition was to close with as many enemies as possible in single combat and, unless they achieved this quickly, their corporate strength soon disintegrated. The second reason for the failure of Mughal armies to adopt the European battle techniques extolled by Manucci was more prosaic: at that time, few Europeans in India actually used them! For example, the leading Portuguese chronicles of the age – those of Couto, Bocarro, Faria e Sousa – all bristle,
But it must be remembered that many of the major Indian fortresses were already so huge that even the heaviest early modern artillery bombardment could make little impression on them: thus the fourteenth-century walls of Gwalior in the Deccan were seventeen metres thick, and those of the Purana Qila at Delhi, built between 1350 and 1455, were the same; the walls of Aga, rebuilt between 1564 and 1574, consisted of two revetments of dressed red sandstone blocks ten metres apart, filled in with sand and rubble. They lacked bastions because, on such a scale, they scarcely needed them: sieges in early modern India were decided by blockade and mines rather than by cannonade. Even in the late eighteenth century, the Europeans could not take any of these strongholds by bombardment.55

But until the late eighteenth century, the Europeans - for the most part - did not even try. Recent research has stressed how anarchic it is to see the West as bent upon world domination from the voyage of Vasco da Gama onwards.56 In fact, the Europeans originally came to Asia to trade, not to conquer, and of these only undertook military expenditure either to coerce reluctant buyers or in order to safeguard themselves against attack from their European rivals; the cost of defence would otherwise have eaten up all trading profits. The Dutch were, however, an exception to this rule: they were already fighting a bitter war in Europe, and they therefore aimed straight for the overseas bases of their Spanish and Portuguese enemies, trying to destroy them, as well as usurping their trade. Heavy military spending was therefore, for them, essential and (according to an official investigation in 1613) even the ‘voorkompaanien’ (the rival associations of Dutch merchants who traded in Asia before the foundation of the United East India Company) spent over 50 per cent of the running costs of each voyage on war-related items. After the formation of the United Company in 1602, the annual figure rose to 50, 60 and even 70 per cent. Indeed the total cost of building Dutch forts on the principal islands of the Moluccas between 1605 and 1612 amounted to no less than 172 million florins, almost one-third of the Company’s initial capital.57 This was because most Dutchmen in the East were utterly convinced that no profit was to be had without power, and no trade without war. In the terse (and oft-quoted) letter of Governor-General Jan Pieterszoon Coen to his Directors in 1614:58

You gentlemen ought to know from experience that trade in Asia should be conducted and maintained under protection and with the aid of your own weapons, and that those weapons must be wielded with the profits gained by the trade. So trade cannot be maintained without war, nor war without trade.

Some of the British in the Far East during the seventeenth century thought that their East India Company should follow the Dutch model. Dr John Fryer, for example, a Company surgeon in Surat during the 1670s, observed that the Dutch were ‘as powerful for men, riches and shipping in Batavia, as in Europe’; and continued:59

[Their strategy] is grounded on a different principle from our East India Company, who are for the present profit, not future emolument. These [the Dutch], as they gain ground, secure it by vast expences; raising forts and maintaining soldiery: ours are for raising aucutions and retrenching charges, bidding the next age grow rich as they have done, but not affording them the means.

But the comparison was unjust. The British, after some initial failures, preferred to concentrate their trade in areas where the native Indian states were relatively small and weak, and European competitors were not deeply entrenched - Golconda, the Carnatic, Bengal.51 The Directors of the Company could therefore take pride in their ability to avoid heavy military expenditure. ‘All war is so contrary to our constitution as well as to our interest,’ they informed their officials in 1681, ‘that we cannot too often inculcate to you an aversion thereto.’ Or, in a rather more succinct message sent in 1677: ‘Our business is trade, not war.

As late as 1750, the Directors still reproached their officials in the field for seeming ‘to look upon yourselves rather as a military colony than as the factors and agents of a body of merchants’; and in 1759 they dismissed the strategic designs of the governor of Madras on the grounds that ‘were we to adopt your several plans for fortifying, half our capital would be buried in stone walls.’ But, by then, the Directors were seriously out of date. The arrival of the French on their doorstep - at Pondicherry, close to Madras, in 1674; at Chandernagore, upstream from Calcutta, in 1686 - was bad enough. But after the reorganization of the Compagnie des Indes in 1719 these modest toe-holds on the subcontinent suddenly became threatening bridgeheads from which French territorial influence in India might be extended. It became inevitable that, whenever Britain and France went to war in Europe, the conflict would now spread to their colonies. But still the Directors of the East India Company failed to see the need for change. As late as 1749, when the war of the Austrian Succession broke out, British forces in India totalled less than 2,000 men, widely distributed over the subcontinent in decrepit, poorly defended fortresses. And so, when the French in the Carnatic launched an attack on Madras in 1746, the 200 guns of Fort St George still had only 100 men to serve them and the chief gunner, Mr Smith, died of a heart attack when he saw the French approaching. The fortress fell. Then, later that same year, the victorious French went on to defeat a superior army of Britain’s Indian allies at the battle of Adyar river with the classic European technique of the musketry salvo: 300 Europeans and 700 native troops, drawn up in three ranks, moved forward against their 10,000 adversaries firing successive volleys of shot. Almost immediately, they were masters of the field.60

The battle of Adyar river proved a turning-point in Indian history. Admittedly, the combination of a core of European soldiers with a larger number of European-trained Indian troops was not new. All the Western
powers in the Orient, from the Portuguese onwards, had tried to compensate for their great numerical weakness by recruiting members of the 'martial races' of Asia, such as the Ambonese in Indonesia or the Pamangkas in the Philippines. They also made use of native converts to Christianity (often descended from a European father), such as the 'topazes' in British India and the 'mardijkers' in Dutch Java. But these various recruits served as auxiliaries, not regulars: they fought in their traditional fashion, with their traditional weapons, and in their traditional formations. The French, however, trained native troops to fight in the European fashion with European weapons and European uniforms; and after 1757 they supplied them with European officers and N.C.O.s too. In that same year, the French governor in Pondichéry informed his superior in Europe that: 'All my efforts are directed towards attaining for you vast revenues from this part of India, and consequently placing the French nation in a position to maintain itself here even when it may lack support from Europe.'

His British rival was well aware of the threat. 'Since the French have put themselves in possession of extensive domains', Governor Saunders wrote to his superiors in February 1751, 'and have raised their flag at the bounds of our territory and have striven to constrain our settlements to such an extent that they can neither receive supplies nor goods, it has been judged essential to thwart their designs, lest their success render our situation worse during peace than in time of war ... We shall therefore oppose them to the greatest extent of which we are capable.' In this, the British held one decisive advantage: their superior financial resources in the sub-continent. It was not merely that the volume of British trade in Asia by 1750 was roughly four times that of France; there was also the fact that, from the 1680s onwards, the Company's agents in Madras accepted substantial deposits in cash from both Indian and European merchants and officials. In normal times, most of this was remitted back to London in bills of exchange, but when war threatened, or erupted, these deposits provided a useful capital fund from which to finance military expenditure. And as the trade and population of Madras grew, so the capital on deposit increased. By the 1750s it was sufficient to allow the Company to follow the French example and raise their own companies, battalions, and, eventually, regiments of 'sepoys' (as these troops were known, from sipahi, the Persian word for soldier). There were two sepoy battalions in the Company's service by 1758, five by 1759, and ten - some 9,000 men - by 1765. With numerical strength such as this, enhanced by the new, more reliable flintlock muskets and the quick-firing field artillery exported from Europe, it was now possible for the Company to challenge not only its French rivals, but also the smaller native states of India with some chance of success.

The first major opportunity occurred in Bengal in 1757. The Mughal empire in its prime could call upon the services of 4 million warriors but, after the death of Aurangzebe in 1707, a number of satraps on the imperial frontier had broken away and created their own separate states. Nevertheless the military strength of these rulers remained formidable, compared with the Europeans. The decision to send an army of sepoys and British troops to Bengal in 1757, under the command of Robert Clive, was something of a wild gesture. Admittedly the new nawab of Bengal had given provocation by taking Calcutta, and demanding increased payments from the Company in return for trade; but his army was ten times the size of Clive's 2,000 sepoys and 900 Europeans, and was assisted by French military advisers.

But, at the battle of Plassey, Clive won. The nawab, Siraj-ud-Daulah, was executed and a replacement more acceptable to the British set up in his place. After some years of further hostilities and negotiation, in 1765 the Mughal emperor and the nawab finally recognized the right of the British Company to collect all state revenues in the provinces of Bihar, Orissa and Bengal. It was wealth beyond the dreams of avarice: the 'net amount of territorial revenues and customs, clear of charges of collection' received officially by the Company leapt from nothing before 1757 to almost £2 million in 1761-64, and to almost £7.5 million in 1766-69. With the aid of these funds (all paid in silver), it proved possible to build impregnable fortifications and to raise armies large enough to intervene effectively in the Deccan, in Mysore - indeed, anywhere in the sub-continent. By 1782 the British were able to maintain 215,000 men in India (90 per cent of them sepoys) and reduce the odds against them in battle from the 10 to 1 of Plassey to only 2.7 to 1 against states such as Mysore. The prospect of the European domination of India, to match the European domination of America, now became a real possibility.

And then, at the eleventh hour (as it were), some native rulers adopted Western military techniques with such success that the British were stopped in their tracks. Under the direction of over 100 European experts (mostly French), excellent bronze artillery was cast for the Maratha confederation which even Sir Arthur Wellesley (later duke of Wellington) found 'answers for our service'; and the new field guns were supplied to the Maratha sepoys, also directed by Europeans, on a more generous scale than the British - each Maratha battalion had five field pieces against the British two. Indeed, Wellesley considered himself lucky to win at Assaye in 1803: 'The battle was the most severe that, I believe, was ever fought in India,' he wrote. Two years later, General Lake, after another hard-won victory over the Marathas at Laswari, wrote that 'Had we not made a disposition for attack in a style that we should have done against the most formidable enemy ... we might have failed'; while Major Thorne, a survivor of both battles, wrote a lengthy Memoir some years later to warn the people of Europe of 'the changes that have taken place among the warlike tribes of India,
through the introduction of European tactics and French discipline which, combined with their natural courage often bordering on enthusiastic frenzy, and their numerical superiority, has rendered our conflicts with them sanguinary in the extreme.\textsuperscript{69}

But in the end, the greater experience of the European forces told. The Marathas may have possessed an impressive field artillery, but by the 1800s they had still not fully mastered the correct method of deploying it — for almost all the guns were lost after their defeats (71 pieces at Laswari, 98 at Assaye, 164 at Agra). Likewise, the Marathas may have started out with European and Eurasian officers to train their sepoys but, before the crucial battles, most of them were lured away by bribes, leaving the rank-and-file to fight on alone. It seems like another case of routine mimics: princely India only adopted Western inventions — whether in art, in clothing or in war — reluctantly and, when she did so, imitated too little and too late. But whatever the reason, the military resources of India, once under European control, were to prove decisive for the further rise of the West. As early as 1762, a detachment of 650 sepoys was sent to assist the British to capture Manila; and after the defeat of the Marathas, such foreign service became more common — in Burma, in East Africa, above all in East Asia. For the Europeans now possessed the means to challenge even their most powerful opponents. The Western armies that invaded China in 1839–42, 1859–60 and 1900 all included important Indian contingents. Immediately after the Boxer Rising, even the traffic of Peking was directed by Sikhs. In the words of the distinguished Sinologist Louis Dermigny: 'It was as if the British had subjugated the Indian peninsula simply in order to use its resources against China.'\textsuperscript{70}

\section*{III}

If, therefore, the native peoples of America, Siberia, Black Africa and the Philippines lost their independence to the Europeans because they had no time to adopt Western military technology, then those of the Muslim world apparently succumbed because they saw no need to integrate it into their existing military system. But the peoples of East Asia, by contrast, were able to keep the West at bay throughout the early modern period because, as it were, they already knew the rules of the game. Firearms, fortresses, standing armies and warships had long been part of the military tradition of China, Korea and Japan. Indeed it may be recalled that both bronze and iron artillery were fully developed in China before they spread westwards to Europe (page 83 above). However, after the mid-fourteenth century, contact between the Far East and the Far West diminished, and the subsequent evolution of firearms in the two areas took a somewhat different course. By 1500, the iron and bronze guns of Western manufacture — whether made by Turkish or

Christian founders — proved to be both more powerful and more mobile than those of the East, so that when they were brought to the Orient in the sixteenth century they attracted both attention and imitation. They may have arrived in China as early as the 1520s, perhaps with one of the numerous Ottoman diplomatic missions to the Ming Court, but, if so, knowledge of them seems to have remained confined to government circles. For most Chinese, Western-style firearms were first encountered in the hands of pirates operating from Japan against Fujian in the late 1540s.\textsuperscript{71}

Although guns were not widely employed by Ming forces against the wukō (page 84 above), they were introduced shortly afterwards on China's northern frontier for use against the nomads of the steppe. In 1564, for example, the Peking garrison replaced their clay-cased cannonballs with lead; and in 1568 these too were abandoned in favour of iron. Then, in the 1570s, under the direction of Ch'\'i Chi-kuang (who had masterminded the defeat of the pirates), the Great Wall was rebuilt with pili-boxes to shelter musketeers, and the reserve units of the northern army were strengthened with small carts (known as 'battle wagons') each carrying breech-loading light artillery and served by twenty men.\textsuperscript{72}

A remarkable source which illustrates the degree to which European weaponry had been adopted on China's northern frontier under the late Ming is the illustrated "Veritable records of the Great Ancestor (Tai-tsu shih-lie)," compiled in 1535 to record the deeds of Nurhaci, founder of the Ch'ing dynasty (plates 35–36). It is significant that in the pictures of the 'Great Ancestor's' early victories all the guns are on the side of the Ming: the Imperial armies are shown deploying field-guns, mounted either on trestles or on two-wheeled 'battle wagons', while the northern warriors seem to rely on their horse-archers.\textsuperscript{73} But in 1629, the Ch'ing attacked and annexed four Chinese cities south of the Great Wall: in one of them, Yung-p'ing, a Chinese artillery crew 'familiar with the techniques of casting Portuguese artillery' was also captured. By 1631, some forty of the new European-style artillery pieces had been made by the captives and, directed by men who had received either first- or second-hand training from Portuguese gunners, they were soon in action against Ming positions. Gradually, as shown in later illustrations from the Tai-tsu shih-li, they appeared on the Ch'ing side.

But firearms remained only a minor part of the armament of Chinese armies. After all, the Ming supported (in theory at least) some 500,000 men and 100,000 horses on the northern frontier, while the Ch'ing army that entered Peking in 1644 probably numbered 280,000 warriors: it would have been almost impossible to equip all these troops with Western-style firearms.\textsuperscript{74} So the soldiers of the new dynasty continued to fight in the traditional manner until the nineteenth century. It is true that, in 1673, the Chinese Imperial army was supported by 150 heavy guns and numerous batteries of field artillery, cast under the direction of Jesuit missionaries in Peking, but this
Firearms in the battles between the Ming and Ch'ing for control of China all appeared, at first, on the side of the Ming. However, in the later 1620s and in the 1630s the northerners began to use artillery as well as archery to defeat their foe. These pictures from the Tai-tsu shih-lu ('Veritable records of the Great Ancestor', sc. Nurhaci), with captions in both Chinese and Manchu, were originally prepared around 1635 and suggest that, although the Ming possessed numerous types of firearms and gun-carriages, they seemed unable to use them effectively.
was a specific campaign against dangerous domestic enemies (the ‘Three Feudatories’ and their supporters).\textsuperscript{75} At other times, the main strength of the Ch’ing lay in the overwhelming numbers of their armed forces.\textsuperscript{76}

The Japanese, however, whose armies in the mid-sixteenth century were considerably smaller than those of their great continental neighbour (even though much larger as a percentage of the total population), made far more use of Western firearms. It is generally accepted that they were first introduced by some Portuguese castaways in 1543, on the island of Tanegashima south of Kyushu, and that they were quickly copied by Japanese metalworkers.\textsuperscript{77} Muskets were used effectively in battle by the army of Takeda Shingen in 1555 and a spectacular demonstration of the power of Japanese musketry occurred on 21 May 1575 at the battle of Nagashino. The warlord Oda Nobunaga deployed 3,000 musketeers in ranks in this action, having trained them to fire in volleys so as to maintain a constant barrage (plate 37). The opposing cavalry – ironically of the same Takeda clan which had pioneered the use of the gun – was annihilated. The battle-scene in Kurosawa’s film Kagemusha (The Shadow Warrior) offers a credible reconstruction, for the action is intended to represent Nagashino.\textsuperscript{78}

The originality of Japan’s rapid adoption of the gun has perhaps not always been fully appreciated. In the first place, whereas Europe concentrated on increasing the speed of reloading, the Japanese were more interested in improving accuracy. So Western military manuals explained primarily how a soldier could recharge his weapon more rapidly, while Japanese treatises – from the 1550s onwards – gave instruction on how he could take better aim. The Tanegashima were, for their day, remarkably accurate. But this in fact accentuated the crucial defect of the muzzle-loading musket: the length of time required to recharge it. As noted above (pages 18–19), the only way to overcome this disadvantage was to draw up the musketeers in ranks, firing in sequence, so that the front file could reload while the others behind fired. This solution was not even suggested in Europe until 1594, and it did not pass into general use there until the 1630s. Yet Oda Nobunaga had experimented with musketry salvos in the 1560s, and he achieved his first major victory with the technique in 1575, twenty years before the European innovation.\textsuperscript{79}

By the time Nobunaga was assassinated, in 1582, he had conquered about half of the provinces of Japan; after a brief hiatus of disorder, the work was continued by two of his most brilliant generals, first Toyotomi Hideyoshi and then Tokugawa Ieyasu. As further provinces were brought under central authority, the size of the main army was swollen by contingents from Hideyoshi’s new vassals and allies. In 1587, when he decided to invade the island of Kyushu, almost 500,000 troops were mobilized. The island was conquered in a matter of weeks. The reunification of Japan might perhaps have been achieved without the gun, but the ability to turn large numbers of peasants

37 The battle of Nagashino, 1575, marked a decisive stage in the reunification of Japan after almost a century of civil war. The troops of Oda Nobunaga, on the left, used volley-fire from their Western-style muskets to destroy the charges of the Takeda cavalry. It was a striking demonstration of the power of firearms, which now assumed a prominent (if transient) place in Japanese warfare.
into effective musketeers certainly accelerated the process. As leyasu informed the king of Siam in 1670: ‘guns and gunpowder are ... what I desire more than gold’.38

Nobunaga and his successors also saw the usefulness of the heavier guns used by the Westerners, and they seem to have realized immediately that artillery would render indefensible almost every existing castle and fortress in Japan, since (as in Europe) any wall that was built high, in order to keep besiegers out, was thereby rendered vulnerable to the impact of artillery bombardment. A new sort of defensive fortification therefore emerged, situated on a ridge which was surrounded by stone walls in such a way that they could be backed by solid rock and soil. A prototype was built by Nobunaga himself beside Lake Biwa at Azuchi, between 1576 and 1579, using the combination of hilltop and thick stone walls to produce a virtually solid bailey, surrounding a seven-storey keep of unparalleled beauty.39 But Azuchi was almost totally destroyed after its creator’s murder (although the ruins of the outer walls and the surviving foundations of the keep are still impressive). Even less remains of another massive fortress of this period: Odawara, the stronghold of the Hojo clan, large enough to shelter 40,000 warriors and surrounded by twenty outlying forts. It required an army of over 100,000 men to starve it out in the summer of 1590 and was destroyed after its capture by Toyotomi Hideyoshi – giving rise to a popular doggerel the following year.

So what’s the use of hauling rocks and building castles? Just look at Azuchi and Odawara!40

Rather more exists today of the even larger citadels built by Hideyoshi and his followers, who preferred to fortify isolated hills on the plain. There is a remarkable homogeneity about the sixty or so surviving castles built in Japan between 1580 and 1650 from Sendai in the north to Kagoshima in the south, even though some were bigger than others. Kato Kiyomasa’s castle at Kumamoto, for example, was twelve kilometres in circumference (with forty-nine turrets and two keeps); Ikeda Terumasa’s beautiful ‘White Heron castle’ at Himeti, almost as large, was constructed with an estimated 103,000 tons of stone (plate 38); while the walls of Tokugawa Hidetada’s vast citadel at Osaka extended for over thirteen kilometres. Some of the individual stones used to build the defences of Osaka weighed 120 and 130 tons each and were brought to the site from all over Japan by feudalatories anxious to prove their loyalty to the regime; even today each da inex’s mark can still be seen, affixed to ‘their’ rocks (which were also given special auspicious names). With such blocks, more appropriate to a pyramid than to a castle, walls were built that were in places nineteen metres thick.41 Quite possibly (as Professor J. W. Hall pointed out some years ago) these Japanese castles had ‘no peers in terms of size and impregnable’ anywhere else in the early modern world.42

Once again we find that, although the Japanese leaders were perfectly prepared to take over Western military innovations, they always adapted them to local conditions in a distinctive way.43 Early modern China, however, had no need of Western examples in the art of defensive construction; her rulers had already been living with gunpowder for centuries, and the massive fortifications erected under the Ming dynasty had been designed to resist both artillery bombardment and mining. It is true that the Chinese had no castles, preferring to fortify whole towns – indeed the Chinese character most often translated as ‘wall’ (cheng) is also the character most often translated as ‘city’– but these towns were surrounded by massive walls (fifteen metres thick in places) that could withstand even modern shells. Thus in 1841, during the Opium Wars, a two-hour battery from a 74-gun Royal Navy warship on a fort outside Canton ‘produced no effect whatever’, according to an eye-witness. The principle of their construction was such as to render them almost impervious to the efforts of horizontal fire, even from the 32-pounders’. Likewise, the British expeditionary force sent to China in 1860 found the walls of Peking impregnable. According to the British commander, General Grant:

Ancient history tells us the walls of Babylon were so broad that several chariots could be driven abreast on top of them; but I really think those of Peking must have exceeded them. They were upwards of 50 feet in breadth, very nearly the same in height, and paved on the top where, I am sure, five coaches-and-four could with a little management have been driven abreast.44
Thus the scale of fortification in East Asia in effect rendered siege-guns useless. That may be why indigenous heavy artillery never really developed there: in Japan, it was only seriously deployed against Osaka in 1615 and against a rebellion at Shimabara in 1636–7 (and on both occasions it proved indecisive); in China, it was seldom used offensively except during the 1670s. In both empires, sieges were usually decided by mass assaults, mining or blockades rather than by bombardment. Heavy guns, both of traditional and of Western manufacture, were certainly employed to defend the massive walls; but, otherwise, the use of artillery in the land warfare of East Asia was confined to the field.

Even so, the great states of East Asia paid more attention to the military innovations of the Europeans than to any other aspect of Western culture (except, perhaps, for astronomy and the clock). But this paradox may easily be explained when it is remembered that the seaborne arrival of the Europeans in the Far East coincided with a period of sustained political disintegration in both China and Japan. In the former, instability lasted roughly from the renewal of pirate attacks on Fukien in the 1540s to the suppression of the last of the Ming loyalists in the 1680s; in the latter, the era of civil war lasted from the start of the Onin war in 1467 to the fall of Odawara in 1590. Throughout this long period, every military innovation was naturally accorded close attention; but once stability was restored, the value of such things as firearms diminished. In China, they were largely confined to the frontiers; in Japan, most remained in government arsenals, and throughout the century the production of guns (which could only be made under licence) was steadily reduced.

But Japan did not merely 'give up' the gun. After 1580, successive central governments carried out a series of 'sword hunts' aimed at removing all weapons from the temples, the peasants, the townsmen — from anyone who might try to resist the administration's taxes or policies. Some of the confiscated swords were melted down to make a great metal Buddha at Kyôto, while others were kept in state arsenals for use in emergencies (for instance during the invasions of Korea during the 1590s), until in the end wearing the sword became largely confined to the hereditary arms-bearing class (the samurai). However, although the samurai might be left with their swords, they were deprived of most of their castles: starting (again) in 1580, the central government commenced a systematic destruction of the fortifications belonging to its defeated enemies. Then, in 1615, the shogun decreed that each lord could thenceforth maintain only one castle: all the rest should be destroyed. Thus in the western province of Bizen, for example, where there had been over 200 fortified places at the end of the fifteenth century, there were only ten by the 1590s, and after 1615 only one — the great 'Raven Castle' at Okayama. This 'demilitarization' of Japan even affected literature. For some decades after 1671, the importation of all foreign books concerning military matters (and Christianity) was forbidden; and the Honcho Gunki-ko (On the military equipment of our country), completed in 1722 and published in 1737, contained only one chapter on firearms, and that was brief.

But by that time the West had also largely lost interest in Japan, for the European presence in East Asia had changed substantially. The Dutch had been expelled from Taiwan in the 1660s (page 113 above) and their factory in Japan no longer yielded vast profits; the Iberian powers had lost much of their trading empire in the Orient; and the English East India Company still traded relatively little in the Far East. So China and Japan remained largely unchallenged by the Europeans during the eighteenth century; nor did they threaten each other. The distinctive 'world order' of both China and Japan endured intact until the Industrial nations of the West deployed steamships, steel artillery and sepoys against them in the mid-nineteenth century. They did not fall before the military revolution.