

East Sails West

The Voyage of the *Keying*, 1846–1855

Stephen Davies



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Introduction: Views from Different Seas

Because of its record-making and very singular voyage, the sailing junk¹ *Keying* is an interesting and apposite synecdoche for early—and enduring—British colonial Hong Kong. To understand the successes and failures of the *Keying*, to understand its missed opportunities and achievements born of lucky breaks, to understand its radically separate microcosms that had to pull together or drown together, to grasp the *Keying*'s erratic course towards an overambitious destination, with its drawn-out and sorry dénouement, to see that the knowledge and work of the largely anonymous many were the indispensable foundation for the small achievements of the marginally recorded but more fortunate few is to begin to have a sense of Hong Kong's peculiar identity and the main tropes of its story.

Why is a relatively unknown, mid-nineteenth-century, late Qing dynasty (1644–1912) Chinese vessel, which made a voyage that was a nine-day wonder in contemporary eyes, of true historical importance? What makes it more than a mere footnote for the enthusiastic maritime antiquarian of the Chinese and colonial maritime past? Above all, what makes it more than an interesting *aperçu* on a small place that thought it beat, and even continues to think it beats, a big drum in the rhythm of the histories of China, Britain and the larger world?

Looking at the Hong Kong Waterfront

To get a grip on the answers to these questions, it is necessary to elaborate a little on context. There is nowhere better to start than with a mental image of Hong Kong harbour in the last quarter of 1846, with our eyes focused on the roadstead immediately off the shores of the still new City of Victoria, seeing things through

the eyes of the Western inhabitants of this rough diamond of a China-coast débütante. What we are looking at are ships. And what we are seeing is a dramatic contrast.

This is before the days of photography, so our reconstruction must rely on the work of Murdoch Bruce, Overseer of Roads and Superintendent of Convict Labour, whose images of Hong Kong in 1846 are well known.² We can supplement the images with what documentary evidence there is about the harbour traffic that fell within the purview of the Harbour Master, Lieutenant William Pedder, late of the Royal Navy.³

Happily, one of Bruce's images was made looking westwards from Murray's Battery; another westwards from the Chief Justice's house, which we know was atop the more westerly of two low ridges pushing out from where Kennedy Road now meets Queen's Road East; a third filling the gap in between by viewing the waterfront of the Spring Gardens, today a busy street in Wanchai; and a fourth looking northwest from Causeway Bay towards Jardine Matheson's East Point complex.⁴ So the whole harbour is quite well covered. With our eyes wholly biased by our Western maritime tradition, what do we see?

Traditional Chinese Sail

Concentrated towards the western end of the new settlement, already sprawling the three miles along the shoreline from present-day Sheung Wan to Causeway Bay, is a busy, jumbled congeries of traditional Chinese vessels, both small and large. There are many rowing sampans and small, single-masted sailing sampans. These are scattered along the western shore, become less frequent as we pass the embryo naval dockyard, and thicken up again along the Wanchai waterfront to Causeway Bay. Further out from the shore of Sheung Wan, already the focus of the new city's growing Chinese population, are a score or so two- and three-masted junks. None of the latter is very large because the terms of the Supplementary Treaty of the Bogue,⁵ signed at Humen just three years previously by Sir Henry Pottinger, then Governor of Hong Kong, and the Imperial Commissioner, Qiying, meant that Hong Kong was effectively excluded from the flourishing Chinese coastal and *nanyang* trades.⁶ So, of the large 35- to 55-metre-long A- and B-class junks of China's sea trade, there are few, if any.

All the Chinese vessels we can see are very workaday. Their joinery is rough, often with the external planking of unfaired timber, as if someone had just split a few trees and nailed things together. The masts, with their 'bat-wing', single sails made of woven bamboo or tattered, tanbark canvas, are not straight. They are made from single tree trunks that, like most, have a twist here and a turn there. Nor are the masts parallel with each other. The foremast seems to lean drunkenly forward, the mainmast varies between a slight forward lean and upright. And the mizzen, where it exists, is peculiarly set off to one side and is very small. The look of the hull is weird—at the front there is no wave-cleaving, raked bow but instead a flat plate sometimes tapering trapezoidally towards the waterline with, in the larger junks, two soaring 'wings' on each side of the top joined by a horizontal windlass, from which two ropes disappear down below the hull. The stern is unaccountably higher than the bow, so the whole vessel looks as if it is trimmed bow down.

The rigging—what there is of it—is not all a-tanto with the standing rigging Stockholm-tarred and with the falls of halyards and sheets neatly coiled down and hung on ordered ranks of belaying pins on neat pinrails round the mast partners. There are no trimly white-painted topmasts. There is no obvious coppering, but instead a coating of ashy-grey *chunam*. The running rigging and the anchor cables—and those curious lines disappearing over the bow and into the water below the hull—come to pretty rough-looking horizontal windlasses working in simple plain bearings. The hulls lack gingerbread and fine joinery on the Chinese equivalents of the trailboards, cap rails and taffrail. The paintwork, where there is any, is brightly coloured, and the transoms are decorated with an amazing swirl of curlicues and flourishes with, here and there on the larger examples, some enormous bird.⁷ It all looks simultaneously exotic, crude and archaic.⁸

When junks up hook to sail away, there is a cacophonous outburst. Gongs thrum. Drums beat. Firecrackers explode in a rattle of smoke, flashes and sounds. There is a tumult of voices and a rush and flurry of movement every which way. Everything seems almost random and as if there is no system; no one in charge of each evolution to ensure it is carried out in regimented sequence at an appropriate word of command or shrill of a bosun's call.

And then there is the contrast.

The Ships from the West

Dominating the harbour are the ships of the Royal Navy. In August 1846, the strength of the China Squadron of the East Indies Station was much reduced from the immediate aftermath of the First Opium War. Its main task had become suppressing piracy.⁹ But even so, at any one time there would have been a representative sample of the ships that had gained Britain not only dominance of the world's seas, but dominance of the coast of China. The largest ship would have been HMS *Agincourt*, the flagship of Rear-Admiral Thomas John Cochrane, Commander-in-Chief of the squadron. She was a third-rate ship of the line launched in 1817, armed with 74 guns and crewed by 442 officers and men, 53 boys and 125 marines. Her skipper was Captain Henry William Bruce, who, in the manner of the mid-nineteenth-century Royal Navy, was Admiral Cochrane's brother-in-law. Although only a third-rate, she packed a massive punch.¹⁰ For those in Hong Kong who could recall the naval fights of the recent war, the *Agincourt* alone seems to have been able to fire, in a single broadside, a far heavier weight of metal than the entire fleet of junks that constituted the naval defences of Canton (Guangzhou) in 1840.¹¹

Her construction was a masterpiece of wooden shipbuilding at the apex of its development in the West. It was massive. It was hugely strong, to take the smashing recoil of her armament or the crashing impact of an enemy ship's response. It was, above all, breath-takingly complex, involving tens of thousands of specialized fastenings and thousands of uniquely shaped pieces of timber, many selected from 'natural crooks', or curves and shapes that had grown with a particular radius or shape.¹² Her rigging was a maze of complexity, each of the three made masts¹³ with their topmasts and topgallant masts held up by some eighteen backstays, four forestays and ten shrouds; each of the eleven squaresails managed by up to nineteen different control lines; and each of the four or five fore-and-aft sails by four.

Different Ships, Different Long Splices

Supporting the flagship were frigates, like the 46-gun HMS *Daedelus*, and sloops like the 26-gun HMS *Iris* and the 18-gun HMS *Columbine*. Each was a similarly

complex structure; even these smaller vessels were heavily armed by comparison to even the best-armed equivalent Chinese naval ship or pirate junk. All were operated with almost machine-like precision, by well-drilled crews ordered in strict hierarchy, whether making their way across the oceans or engaged in battle. Bosuns' calls shrilled. Hands leapt into the rigging. Gun crews five to seven strong clustered around their weapons, each man with a specific, regimented task in the orchestrated, eight-stage exercise of firing the gun, all done to the word of command of each gun captain as the cannons crashed every minute and a half or so.¹⁴ Watches rotated to the stroke of the ship's bell. Each man of the new watch relieved his opposite number of the old. Ritual handover exchanges were passed between watch officers—'Course west by a quarter south running free, all plain sail set, wind North East blowing a fresh gale, no ships in sight. Your watch, Mr Jolyon.'

A precise chain of command ran from the lowest ship's boy to the commander-in-chief. Complex visual signalling using code flags and detailed code books ensured intentions were understood, instructions conveyed and intelligence passed. The ships could sustain themselves in full fighting trim on a three-month voyage from Europe to Asia, and in principle—and usually in practice—could engage in battle at the end of it as well as they could a day out from their port of departure. Indeed, with a settled, fully integrated crew, arguably better. They would have completed the voyage in fair wind or foul, the Royal Navy's routines having been honed by the years of blockading during the French Wars in which many of the senior officers of the 1840s had begun their service.¹⁵ Routines that had since been maintained in providing the worldwide reach of the still growing British empire held together by the sea lanes the ships patrolled.

Of course all that was true, though in significantly different ways, for the Chinese maritime world too, though the ships were far less complex and required, to sail, much less by way of ordered orchestration and routine. There was a similar, though perhaps less codified and ramified, organizational hierarchy. Ships were similarly operated, though as much by effective customary practices as by tabulated, organized systems. There were, quite evidently, signalling systems by which commanders controlled the ships of their squadrons and fleets.¹⁶ But all this was little understood by Westerners; had understanding been better, the difference in orders of magnitude on almost any chosen measure might perhaps have stood out even more plainly.

Steaming to the Future

But the Westerners' eyes on this still half-started, modern waterfront—as much matshed (rush mats covering a bamboo frame) and mudflat as buildings and seawalls—would necessarily also have been drawn to novelty. To a pregnant, innovative and still bizarre military sign of the future: the Royal Navy and East India Company Indian Navy's steam-paddle ships. The *Nemesis*, which had dominated the naval fighting during the First Opium War, was still on station along with others, though there would seldom have been more than one or two in Hong Kong at once. The revolutionary *Nemesis* was iron-hulled. The rest, like the *Pluto*, *Vixen*, *Phlegethon* and *Spiteful*, were wooden. They only mounted six guns, but these included two pivoting thirty-two pounders, allowing firing over comprehensive arcs, as well as four or so more conventional, broadside-mounted, smaller-calibre weapons. The paddle boxes and coal bunkers got in the way of the array of larger broadside-mounted guns characteristic of sailing warships of the day. But this still-radical solution was pointing forward to the turret-mounted guns of the future. Despite the paucity of guns, however, the ships' ability to manoeuvre independently of the wind made them deadly not only in themselves, but also because they could tow the larger, massively armed vessels like the *Agincourt* to where they could wreak their havoc, as Britain's navy had proved, in the ascent of the Yangzi to Nanjing that had ended the First Opium War. These odd, thrashing, smoking, puffing vessels were ships that were utterly changing the face of naval warfare, especially in Asia. They would soon change the face of merchant shipping, too.¹⁷

The Coming Apogee of Square Rig

Finally, it is highly probable that our observant Westerner, looking out at the harbour and having dismissed the specimens of China's long and fascinating naval architectural tradition as archaic relics of no account, would have known about ships and the sea. Few in Hong Kong in 1846 would not have had a prolonged and intimate acquaintance with both, merely in order to have reached Hong Kong in the first place. Many would have been directly involved in the shipping world, especially in the nefarious bedrock of early Hong Kong's sea

trade—opium. The language that Admiral Smyth's *The Sailor's Word-book* would begin to tabulate in 1858, over some 15,000 terms in its 744 pages, would have been familiar to them. So, having assessed the Royal Navy's protective 'wooden walls'—their eyes passing over the out-of-commission, mastless 'hulks' used as floating warehouses for opium waiting to be smuggled into China, or the hulked warship serving as a hospital ship, with its trim awnings covering the entirety of its deck,¹⁸—they would have focused on the ships used to do the smuggling: the opium clippers.

Despite their scabrous and blatantly illegal trade, these were revolutionary ships, representing the beginning of the last hurrah of Western sail. Small, heavily rigged for maximum power, sleek in shape, these vessels could outrun and out beat¹⁹ almost anything on the water. Pioneered by the American Baltimore schooner *Dhaulie* of 1825 and the famous—or perhaps infamous—*Red Rover* of 1829, itself based on the lines of a French-designed, American-built privateer, the whole object of the vessels was to overcome the main limitation on seaborne trading since time immemorial: the monsoons.²⁰ For a millennium and more, Asia's sea traders had set out from China, with their cargoes of ceramics, ironware, tea, herbs and countless other goods, on the wings of the winter, northeast monsoon. Once at their destinations, they would trade their outward cargo and amass their backhaul cargo—tin, rice, spices, tropical woods, trepang and other foodstuffs—while waiting for the change of monsoon in the spring, and then set sail for home.

The opium clippers broke that mould. Of course, it had been broken long before when the occasional ship toughed it out. We know, for example, that a Dutch despatch ship made Java against the monsoon to summon help when Zheng Chenggong was besieging Fort Zeelandia in Tainan, Taiwan, in 1661.²¹ But it was hard, unrelenting work, and wrought expensive havoc on the vessels that tried it. They got to their destination, if they did, with ripped sails, damaged rigging, broken spars and sprung masts and planks. Or they went the very long way round, south of the Equator and up east of the Philippines, almost doubling the length of their voyage.²² Only dire necessity would induce anyone to try either. That is, until the fabulous profits of smuggled opium beckoned. Well-armed, heavily canvassed, run like warships by well-paid, hard-driving, crack skippers, with crews of seasoned and skilled seamen, the opium clippers were

well suited to their wicked trade. No other vessels could begin to match them, unless there was no wind . . . and then those guns would come into play.

But, if you forget the malignity of the opium trade for a moment, as our typical Western observer on the 1846 Hong Kong waterfront very easily could, the clippers were beautiful. A clean sheer, running from a sharply raked bow and preceded by a long, stabbing finger of bowsprit and jib-boom. A low freeboard and a narrow beam for the vessel's length, suggesting fast, clean lines below the water, developed from ever-refined half-models with the help, increasingly, of drafted plans by better and better informed naval architects. Raked, sky-reaching masts interstitched with a thicket of finest-quality running and standing rigging, crossed by yards with sails neatly furled and stopped in gaskets along them. Here was the epitome of speed and grace under sail. The cynosure of anyone with an eye to see what a masterpiece of naval architecture should look like.

Why the *Keying* Looked So Different: Naval Architectures Poles Apart . . .

Our observer, as a nautical insider, will also have been aware that this was an age of increasingly scientific naval architecture. In just a few years, the first systematic treatise in English would be published²³—in London, of course—confirming that what could be seen in the new Port of Victoria in the harbour of Hong Kong was the product, not of some vernacular shipwright reproducing the patterns—and the errors—of aeons, but of the subtle theories of science. Fincham's history was itself a development of a textbook he had written a generation earlier, for the use of the young naval officers at the Royal Navy's new naval academy in Portsmouth, for whom an understanding of the technicalities of the ships they would work and later command was increasingly being considered essential.²⁴ That too would have been an apparent contrast of which our observer would have been aware.

And then again, there were those junks and sampans. To our Westerner's eyes, there was no competition. These were mere relics of the past; at best curiosities for the antiquarian, at worst complete irrelevancies. And yet, had he looked more closely—and with that relative novelty, a keen and thoughtful naval architect's eye, especially the eye of a Western naval architect at the cutting edge, like I. K.

Brunel, who was among the first to bring engineering principles to the construction of the newfangled iron hulls—he might have been surprised. For there was much in the structure of a typical junk that solved the basic problems of how to design a strong, seaworthy ship that was economical to build and economical to operate, in ways that might be seen to ‘anticipate’ what Western naval architects would develop, as the nineteenth century gave way to the twentieth.

If you are familiar with the broad development of comparative Chinese and Western naval architectures and of their more broadly defined maritime social histories—specifically in relation to the social role of the sea, to the history of navigation and to the evolution of ship organization—you can ignore the next few pages. But if these are for you, as for most, esoteric subjects, then what follows is important. For what these deeper and wider issues betoken is the importance of the *Keying* and its voyage, not just as a cypher for the microcosm of colonial Hong Kong, but as a cypher for the vast seascape of the vexed relationship between China and the Western world, the heavy swell from which is still being felt today.

The fascinating feature of Chinese naval architecture—what sets it so distinctly apart and, as instantiated in the *Keying*, should have been of enormous interest to the naval architects and budding marine ethnologists of late 1840s and early 1850s New York, Boston, London and Liverpool—is that Chinese ship construction seems to have used a unique blend of both Western approaches to building ships: the ‘skin-first’ and ‘frame-first’ techniques.²⁵ That no such thought crossed the minds of those directly or peripherally involved in the *Keying* story, despite the intellectual context of mid-nineteenth-century Europe being such as to lead one to expect exactly the contrary, is what this book sets out to understand.

At the level of high theory, of course, family resemblances can always be found between Chinese watercraft and their Western cognates. The laws of physics inevitably constrain the solutions to how we move about on the water to a fundamentally similar set. But as is manifestly evident from the reports of early European witnesses, what had emerged over the course of the first few thousand years of maritime development in China had its roots so ‘buried’ that what Western sailors saw did not easily ‘map onto’ the shapes, structures and rigs familiar to them. And that puzzlement evidently endured into the nineteenth

century, as the observation from the best known version of the *Keying's* visitor's guide, of which there are two or three,²⁶ plainly states:

It is a most singular circumstance, and which requires actual inspection to convince of the reality of it, that there is neither in the building nor in the rigging and fitting up of a Chinese junk, one single thing which is similar to what we see on board a European vessel.

Every thing is different; the mode of construction, the absence of keel, bowsprit and shrouds; the materials employed, the mast, the sail, the yard, the rudder, the compass, the anchor, all are dissimilar. The native crew are not more unlike the sailors of Europe, than the vessel in which they sail is unlike the ships of other countries. Both the one and the other are men, and the respective vessels are meant to pass over the sea; this is all they have in common, here all similitude begins and ends.²⁷

It is this 'cross-mappable only at the level of high theory' aspect that explains much about our ignorance of the structural detail of the Chinese ship *Keying*. Had contemporaries in New York, Boston, London or Liverpool been more curious about why the *Keying* looked so different, why there is 'neither in the building nor in the rigging . . . one single thing which is similar', and sought to investigate the reasons and causes for this by close interrogation of its form and structure, this book would be unnecessary. On the other hand, that they were not in the slightest interested, other than as in a travelling freak show, is why the story of the *Keying* is important and has provoked what follows.

It was in the fifteenth century that differences of great importance emerged in local naval architectural practices. For around that time, development in Europe began to accelerate in response to unique social, economic and military pressures. In short order, European naval architecture 'took off', and over a period of about three centuries followed a trajectory that placed European ships and seafarers in a position of absolute maritime supremacy over any non-European maritime civilization.

In the simplest terms, the 'take off' entailed two things. First, by the early sixteenth century, the basic design envelope²⁸ of sea-going ships was swiftly zeroing in on one fundamental system of construction²⁹ that proved to have a property of practical scalability that up until that time was extremely rare, if, indeed, it can be seriously identified anywhere.³⁰ This was related to a larger set of social changes vis-à-vis the sea and ships to which we shall revert below. Second, a consequence

of these changes was that European naval architecture became increasingly theorized. The result was a more and more sophisticated exploration of the extent to which the emergent basic design envelope was not only scalable, but also adaptable. That in turn allowed the development of specialist designs, nowhere more distinct and historically important than in the late sixteenth- and early seventeenth-century emergence of the all-gun warship—the man-of-war—with its revolutionary implications for the prosecution of overseas commerce and interstate relations.

Why this should have occurred in Europe is complex; a largely coincidental conjunction of many different forces. Some were geographical, for example Europe's convoluted shape, with its many 'narrow seas', the available timber types, their main growing areas and rates of depletion, and the sources of other vital materiel like pitch, flax, hemp, iron, and so on, for ships' furniture and fittings. Some were, broadly understood, economic, for example typical trading routes, cargoes, methods of financing voyages and the structures of labour markets. Some were regulatory or legal, for example the development of tonnage rules for taxation purposes, the ubiquity of cross-border trade and the development of common frameworks for contracts and dispute resolution. Some were demographic, for example the critical Portuguese turn seawards into the Atlantic when too many people were trying to eke subsistence from too little land. Some were intellectual—the turn to empirical science that has been so widely studied but is still hard fully to explain.³¹ Some—most significantly—were political. Here, especially, figures the seemingly unending rivalry between the numerous emergent European nation-states and the resultant regular warfare that, because of Europe's geographical shape, often entailed the employment of maritime forces in either aggression or defence. And, finally, there was also the perennially troubled, mainly maritime interface between Christian Europe and an expansionist Islam.

Meanwhile, in broadly unified and generally well-governed dynastic China, nothing similar occurred. Other than in the interregnum periods every few centuries, a single governmental system imposed widespread order, within which an intricate and mostly self-sustaining economic system could and did develop.³² When things fell apart, the focus of problem-solving was for the most part resolutely terrestrial. The sea was the periphery. Through the long periods of a settled

state had developed a vernacular naval architecture to suit the economic purposes of this complex but interlinked world.³³ The hull form and rig that had evolved by the Song dynasty (960–1279) from Han riverine craft and Yue kingdom coasting vessels to bear early traders carrying cargo in their own bottoms, as the nautical phrase has it, from China to Korea, Japan and Southeast Asia, was admirably adapted to its monsoon-season sailing rhythms and its growing nexus of ports of call on mainly northeast-to-southwest routes between 40°N and 10°S. But such change as then took place in the near millennium between the eleventh and nineteenth centuries was narrowly incremental. For various reasons and causes, there was no impetus that would drive radical change, even had the design envelope been more hospitable to change than we shall hypothesize that it was. For the design envelope of the ramified family of vessels that had emerged would prove to have certain intrinsic properties quite different from the dominant design in the West, which had emerged far more slowly in response to different imperatives.

The largest Chinese ships of the mid-nineteenth century had developed incrementally from vessels from a millennium before; they would have been familiar in almost all respects to a seafarer of that earlier epoch. If we ignore the highly contentious, indeed technically extremely dubious, claims of the Zheng He treasure-ship boosters,³⁴ it will have moved from being 20–30 metres in length to 60–70 metres, and from 100 or so tons burthen to at most 1,500 tons burthen.³⁵ The unstayed, multi-single-tree-masted³⁶ rigs barely changed, though over a 900-year period the sails passed from conjoined panels of a sandwich of woven rattan or bamboo and leaves, through panels of tightly woven rattan or bamboo, to battened, complete sails of a hemp- and flax-based canvas. And their steering systems, based on a stern-hung rudder developed from a vertically mounted, centreline steering oar controlled by crew working gun or luff tackles,³⁷ changed only in respect of refinements to the rudder blade and the development of a bow-mounted bowsing tackle³⁸ to try to overcome the system's inherent weaknesses when running down sea in a blow.

The single-tree masts, most commonly two to three in number, though instances of six have been recorded, carried the brilliantly conceived sail—in Western terms a fully battened, balanced, standing lug rig—that by the Song dynasty had evolved into a uniquely efficient and potentially labour-saving solution to getting power from the wind. But here too development stopped, save for

minor, incremental improvements. As with the steering system, mechanical inefficiencies from crude materials and working gear meant large demands for the brute force of many hands.³⁹ Almost all crew, indeed most of the maritime world of China, were products of a domain below the bottom of the Chinese social hierarchy; most of the ordinary deckhands were mere muscle power and never called on to exercise significant maritime skills.

The absence of state involvement, the very different manner of capital formation, ships that were cheap to build and economical to operate, systemic illiteracy and a seemingly inexhaustible pool of cheap labour meant there were few, if any, significant competitive or cultural pressures encouraging shipbuilders to improve hull and rig designs, or shipowners to seek them. Indeed, the pressures were quite in the opposite direction, since the socio-economic result of the socio-cultural nexus was arguably the most naked competitive market ever seen in shipping. The structure and rig of the junk were thus, technically, subtle vernacular solutions to producing an easily built hull from the minimum quantity of low-cost materials with minimum high-skill shipwright input, to be operated by dirt-cheap labour. A wide-open market ensured that it paid no one to introduce radical innovations. Of course, this did not exclude innovation—bright and thoughtful minds are what they are and, as Joseph Needham and his collaborators' monumental study shows,⁴⁰ China had as many of those as the Western world—but it did make it spasmodic and unlikely to produce runaway or wholesale change. Additionally, the indifference of the Chinese government and elite towards matters maritime, swinging occasionally into outright hostility, created a climate in which, even were there to have been potential gains from innovation considered purely from a business point of view, the risks of a sudden policy change meant it was unlikely to have been worth trying.

China's maritime story was thus just as much a product of the interplay of complex forces as in Europe. Over the first few centuries, Chinese naval architecture, shipping organization and fluctuating maritime policy, in the context of the Asian maritime world, worked in ways distinctly to China's advantage. Thus by the beginning of the fifteenth century, the largest products of China's shipwrights would seem to have been larger than anything produced in the Western world; the average trading vessel was probably bigger than the average Western equivalent.⁴¹ Their multi-masted rigs drove them efficiently on trading voyages

that ranged more widely than the relatively 'short-seas' world of the contemporary northwestern Europe and the Mediterranean. Their compartmented hulls enabled carriage of separated consignments, while at the same time reducing catastrophic flooding and the fell effects of unrestricted free surface of what water did flood the hull as the result of holing.

But it can be argued that outwith some truly major technical changes, for any glimmerings of which there is no obvious historical evidence, the naval architecture that had evolved in China by the Ming dynasty (1368–1644) may have faced some intrinsic limitations in its basic design envelope. In effect, the design and performance envelopes of the Chinese junk hull and rig had nearly identical boundaries, such that if there were demands for enhanced performance as a result of competitive or other pressures, there may not have been any margin to spare without radical changes in materials and fastening technologies. By contrast, the scalability and adaptability of the Western design envelope created larger margins outside the initial performance envelope that could accommodate increased performance demands. Simply put, among several design constraints built into the Chinese design envelope, two were arguably the most important. Given the system of transverse solid framing, it was difficult to increase internal capacity by adding depth to the hull. Given the rig, it was difficult to add more driving power—in the form of increased sail area—to propel a larger, heavier hull. The system that had evolved in the West, on the other hand, allowed the ready development of multiple continuous decks in the hull. In the rig, by the addition of topmasts and topgallant masts with further staying, more sail area could be added to drive the larger hulls.

... To an Unsympathetic Eye

It follows that the *Keying* presented a unique and intriguing opportunity for analysing and cataloguing these naval architectural differences. Had that happened, Victorian naval architects might have been surprised. For it was in the 1840s, as iron-(and later steel-)built ships began their rapid replacement of wooden build, that Western naval architecture faced a problem with which it was to wrestle for half a century and more. The matter can be simply put. Was the best way to build a metal ship to act as if metal and rivets were architecturally indistinguishable

from wood, bolts and nails and thus continue to use the ‘frame first’ construction method that had dominated—and got ever more complex as ship sizes increased—since the late sixteenth century? Was the wooden world’s system of transverse framing at close intervals the most suitable to iron and steel?

In 1835, just over a decade before the arrival of the *Keying* in London, the young British naval architect John Scott Russell had built an iron ship using a revolutionary new system:

I had to do it entirely out of my own head, and after my own fashion. I gave it a longitudinal central bulkhead, and four transverse ones, connected with a few longitudinal bars. It had absolutely no frame. My second was for a purpose which rendered a longitudinal bulkhead inconvenient, and I employed more numerous bulkheads, longitudinal stays and no frames, and my third the same.

But the young shipbuilder’s innovative approach—which incidentally created more usable cargo space below—did not catch on. Scott Russell is clear as to why: ‘The practical difficulty of continuing to build vessels on this system consisted not only in the prejudices of owners, but later in the Regulations of Lloyd’s.’ And he goes on to attribute the continuation of the older system to the weight of established practice: ‘Out of these ruts it is hard to rise.’⁴²

Scott Russell read that revolutionary paper in 1862, a generation after he had built his first longitudinally framed ship and four years after the most revolutionary example of the technique had been launched: I. K. Brunel’s *Great Eastern*. The *Leviathan*, as it was first named, was a ship pregnant with the promise of the new. Yet coincidentally for this story, it too ended its life as did the *Keying*. As a failed visitor attraction at Rock Ferry on the south bank of the River Mersey opposite Liverpool, then broken up on the mudflats there in 1889–90, almost exactly as the *Keying* had met her end thirty-four years before.

The longitudinal system was not to be widely adopted until 1908, when Joseph Isherwood designed the *Paul Paix* on the lines of the system of longitudinal framing he had patented in 1906. Despite Scott Russell’s pioneering work, the longitudinal system is today still often known as the Isherwood system.⁴³

If we stop for a moment to consider how Scott Russell described his system, we can see how a closer look at the construction of the *Keying*, when it arrived in Britain, might have opened minds. For Scott Russell’s main principles were two.

One was that the 'skin of the ship (is) the most important in point of its functions in giving strength and durability to a ship'. The other is to have 'as many transverse water-tight iron bulkheads as the practical use of the ship will admit'. He then places between each of these complete bulkheads 'partial bulkheads, or the outer rim of a complete bulkhead'. And the longitudinal strength is provided by stringers that run from bow to stern on the inside of the skin plating, one to each row of plating along its centreline. In modern terms, what Scott Russell was advising was to build a ship as if it were a composite, multi-cellular box girder.

Translate that to wood and you get not a bad description of the construction of a Chinese junk along traditional lines. It too was very like a composite, multi-cellular box girder. It had Scott Russell's structural skin, achieved by edge-joining every plank to its neighbour by nails. It had his multiple transverse bulkheads. It had a version of his partial bulkheads. And in the massive wales that ran down the outside of the hull planking, the shelf that ran beneath the deck on the inside of the top of the hull planking and in the keel plank, it had his longitudinals.

Scott Russell and I. K. Brunel were both in London during the *Keying's* stay. Scott Russell had moved to London in 1844 and opened his Napier Yard at Millwall, just around the corner of the Isle of Dogs from Blackwall, where the *Keying* spent most of its London stay. He was elected a fellow of the Royal Society in 1849 and was the organizer of the Royal Commission for the Exhibition of 1851, at which the mandarin He Sing was to star. That was also the body that subsequently decided to spend the profits on creating the centre of education and information in Kensington, popularly known as Albertopolis, which included Imperial College, the Natural History Museum, the Science Museum and the Victoria and Albert Museum, among others.

Meanwhile, Brunel lived in Westminster. In the early 1850s, following the success of the *Great Britain*, launched in 1843, he was already at work planning the *Great Eastern*. Had he and Scott Russell visited the *Keying*, would they have seen what was there? Or would they merely have had their prejudices confirmed like Charles Dickens:⁴⁴

Nothing is left but China. How the flowery region ever came into this latitude and longitude is the first thing one asks, and it is certainly not the least of the marvel. As Aladdin's palace was transported hither and thither by the rubbing of a lamp, so the crew of Chinamen aboard the *Keying* devoutly

believed that their good ship would turn up quite safe at the desired port if they only tied red rags enough upon the mast, rudder, and cable. Somehow they did not succeed. Perhaps they ran short of rag; at any rate they had not enough on board to keep them above water; and to the bottom they would have undoubtedly gone if it had not been for the skill and coolness of half-a-dozen English sailors, who brought them over the ocean in safety. Well, if there be any one thing in the world that this extraordinary craft is not at all like, that thing is a ship of any kind. So narrow, so long, so grotesque, so low in the middle, so high at each end, like a china pen-tray; with no rigging, with nowhere to go aloft; with mats for sails, great warped cigars for masts, dragons and sea-monsters disporting themselves from stem to stern, and on the stern a gigantic cock of impossible aspect, defying the world (as well he may) to produce his equal—it would look more at home on the top of a public building, or at the top of a mountain, or in an avenue of trees, or down in a mine, than afloat on the water. As for the Chinese lounging on the deck, the most extravagant imagination would never dare to suppose them to be mariners. Imagine a ship's crew without a profile amongst them, in gauze pinafores and plaited hair, wearing stiff clogs a quarter of a foot thick in the sole, and lying at night in little scented boxes, like backgammon or chess pieces, or mother-of-pearl counters! But, by Jove! even this is nothing to your surprise when you get down into the cabin. There you get into a torture of perplexity; as, what became of all those lanterns hanging to the roof, when the junk was out at sea; whether they dangled there, banging and beating against each other, like so many jester's baubles; whether the idol Chin Tee, of the eighteen arms, enshrined in a celestial Punch's show, in the place of honour, ever tumbled out in heavy weather; whether the incense and the joss-stick still burnt before her, with a faint perfume and a little thread of smoke, while the mighty waves were roaring all around? Whether that preposterous tissue-paper umbrella in the corner was always spread, as being a convenient maritime instrument for walking about the decks with in a storm? Whether all the cool and shiny little chairs and tables were continually sliding about and bruising each other, and if not, why not? Whether anybody on the voyage ever read those two books printed in characters like bird-cages and fly-traps? Whether the mandarin passenger, He Sing, who had never been ten miles from home in his life before, lying sick on a bamboo couch in a private china closet of his own (where he is now perpetually writing autographs for inquisitive barbarians), ever began to doubt the potency of the Goddess of the Sea, whose counterfeit presentiment, like a flowery monthly nurse, occupies the sailor's joss-house in the second gallery? Whether it is possible that the second mandarin, or the artist of the ship, Sam Shing, Esquire, R.A. of Canton, can ever go ashore without a walking-staff in cinnamon, agreeably to the usage

of their likenesses in British tea-shops? Above all, whether the hoarse old ocean could ever have been seriously in earnest with this floating toy-shop; or had merely played with it in lightness of spirit roughly, but meaning no harm?—as the bull did with another kind of china-shop on St. Patrick's-day in the morning.

The *Keying* is therefore intriguing because, despite the existence of contemporary documentation, remarkably little is known in detail about what kind of a vessel it was, exactly who all of the crew were and most of the human detail of how its unprecedented voyage unfolded. Almost nothing is known about what happened to it and its crew when the voyage ended, and nothing at all, bar a few isolated reports, about the fate of its majority Chinese crew. There are no known remaining log books or diaries, though one can hope that the serendipitous *ejectamenta maris* of attics and auction rooms may one day reveal a happy survival. The documentation there is—newspaper reports, a publicity pamphlet or two, some letters and diary entries, a court record, one public letter and what can be culled from various archive and narrative sources—tends towards generalities rather than specifics and in any case gives the impression of the ship's voyage as a 'nine days wonder' rather than something of any historical importance. There are more holes in the record than there are records proper.

The junk is, accordingly, revealing precisely because of that remarkable paucity of evidence. In European terms the *Keying's* voyage took place during the sea change in the human, natural, and (above all) observational sciences that was surging towards the full flood it reached in the last half of the nineteenth century. Central to this trend was the idea of careful, neutral, quantified measurement and description of the world around us, whether natural or of human artifice. Nothing demonstrated this idea in principle so fully, and yet in practice so partially, as the Great Universal Exhibition of 1851 in London, in which Scott Russell was so closely involved, and which was held at the very time that a sample of the vernacular genius of a different technological tradition was lying in the River Thames, open to public view.

Here was an opportunity for close study of a ship—and its crew—from an utterly different maritime and naval architectural tradition. To the observant and charitable eye—evidently none too common in Victorian Britain—here were solutions to the problems of building a strong, seaworthy sailing ship,

economical and quick of construction, and, as we should put it today, user-friendly. Yet this opportunity was refused in a manner that, given what we know naval architects like Scott Russell were thinking about and working on, is close to purblind. In finding answers to why this should be so, we can see the social limitations of the supposedly 'objective' and 'universal' science and scholarship of the Victorian imperialist era in Britain, particularly where the more lowly and artisanal pursuits like shipbuilding, seamanship and maritime commercial practice were concerned. For another element in this story has to do with its main protagonists. Given the attitudes of the day, hardening in their racial prejudices as the century wore on, the Chinese crew would have been marginalized—or at best patronized—by mainstream British Victorian culture anyway. But what about its European officers?

Seafarers on the Make

For Victorian Britain, the sea may have become mainstream for the admirals and victors, for the explorers and discoverers—the latter whether successful and alive or, in that favoured Victorian icon, failing and heroically dead—and for the maritime merchant princes. An ordinary Joe of the maritime world—a merchant marine officer with no family connection, serving in the rag, tag and bobtail of the merchant service—might attract enough attention and strike lucky or, more likely, never rise from decent, or as often rather downmarket, waterfront riff-raff, obscurity. Joseph Conrad's brilliant novels of this world fully catch the flavour, in Tom Lingard and his mate Shaw, in 'Lord' Jim, even in Marlow, and we know Conrad painted from life.⁴⁵

Charles Kellett and his officers were trying to catch their moment and strike lucky. Perhaps on that memorable day in May 1848, when Queen Victoria and her entourage came aboard and Captain Kellett showed them round, it felt like the moment had come. It had not. It never did. In its inception, in its execution and in its fading away, the *Keying* pressed none of the right Victorian buttons. Not quite the right chaps. Not quite on message. Not quite the right timing.

And yet. What is important is precisely this mid-nineteenth-century world of mutual blindness. For it was Charles Kellett, his partners, his officers and his European sailors, and So Yin Sang Hsi and his fellow Chinese crewmen who are

actually what the story of Britain in China is all about. Their attitudes and understandings, prejudices and closures of mind, shouts, gestures, shoves and kicks, mute, stony-faced and no doubt resentful and bitter acceptance were what made the patchwork sails of the hybrid rigs that powered the single hull of nineteenth-century Sino-British—even Sino-Western—relations.

So the *Keying's* voyage is instructive in maritime historical terms. In the passages from Hong Kong to Europe in 1846–48, we have the only certain voyage of a vessel from the Chinese naval architectural tradition that reached Europe from China via the Cape of Good Hope. Thanks to what documentation there is, it has been possible in this book to reconstruct the voyage such that we have one of the only clear, if limited, accounts of a long ocean voyage by a Chinese, junk-rigged vessel traversing a wide band of latitude, on all points of sail, in a full range of wind and sea conditions. From this, it has been possible to reach some broad conclusions about the performance envelope of a junk-rigged vessel vis-à-vis the performance of contemporary Western vessels sailing the same route. The results should not surprise any thoughtful and thorough student of marine ethnography or comparative naval architecture.

Another item of instruction concerns the crewing of the *Keying* and the light this casts on the great differences in organizational, regulatory and operational practices of nineteenth-century Chinese and Western ships. For this was a Chinese ship officered by both European and Chinese personnel, and crewed by a combination of European and Chinese seamen, in ways that could not avoid combining, willy-nilly, both Western and Chinese modes of shipboard organization and operation. As an experiment, it was something of a crewing failure, whatever its success as purely and simply a navigational feat. In its failures, however, there is much of interest to be gleaned.

The World of the Sailing Junk

All of this is of interest for the simple reason that, until the advent of the twentieth century, to Western scholars and mariners the detailed world of the Chinese junk was little known, whether in terms of how one was built and how it was rigged, or how it was crewed and sailed.

There is still scant material in English translation; some warranted supposition that primary sources in Chinese are by no means numerous; and much reasonable doubt that secondary sources, where they exist, rest firmly on a suitable wealth of detailed primary evidence as to what was the case. There is little in the Chinese tradition, for example, that would equate to the Western world's vast accumulation of logs and voyage diaries or shipyard and dockyard documents and plans. Nor are there the equivalents of the voluminous studies of ship organization and crewing that have appeared over the last century or so, distilled from Western records from the sixteenth century onwards,⁴⁶ whether considering Western mariners themselves or those from other cultures that sailed as Western ships' crew, like lascars.⁴⁷

Where knowledge of pre-twentieth-century Chinese craft is concerned, bar the work of François-Edmond Pâris in the 1830s, most of which was primarily a matter of careful sketches rather than sets of lines, there were and are few images of junks, whether from Western or Chinese sources, that are faithful representations in scale and detail of these unique craft. What images we have are artists' renderings, some good, some bad, but few to be relied upon for a precise sense of China's intriguing and unique technical responses to the challenge of moving people and goods by water and of fighting afloat.

Among Chinese renderings, despite a far older written and pictorial tradition, there are almost no accurate, precisely scaled depictions of sea-going craft. What exist are mostly graphical notes intended to indicate a broad general structure, mostly devoid of any sense of true perspective or scale and containing only such detail as served the immediate, usually decorative or expository rather than technical, purpose. Only in the Qing dynasty does anything more carefully depicted occur—by which time much would have changed—and even then, with one noted Japanese exception,⁴⁸ the sort of specificity one can find in the West in contemporary line drawings and models, leave alone actual draughts and tables of offsets, is wholly lacking.

Where Western images of Chinese craft are concerned, the earliest of which date only from the fifteenth century, the first examples are the merest hints of a craft different from anything in the Western tradition. Different in shape and possibly rig, to be sure, but not otherwise observed in detail. One does need to note, however, that at this date Western representations of Western ships were far from

trustworthy depictions. By the seventeenth century, more detail does begin to appear for both Western and Eastern craft; such images are often helpful in terms of broad proportion and other very general detail. Few if any, however, may be relied on for technical conclusions, especially with respect to the details of construction, fittings or rig. With the exception of one fairly detailed dissection by Pâris of a Qing naval inshore patrol craft, it was not until the work of Worcester in the twentieth century—by which time inevitable changes distinguished the vessels he researched from their forerunners in the Ming and early Qing dynasties and before—that detailed drawings were available.⁴⁹

Although there are some technical details available today from what, to most Western students, were previously unknown Chinese sources, even these bear little or no resemblance to the technical treatises, timber and fastenings lists, lines drawings, tables of offsets, detailed builders' models, early encyclopedia articles and other materials from which we know in extraordinary detail the construction of Western craft, especially warships, from the late sixteenth century onwards.⁵⁰ And none of the more detailed Chinese sources seems to go back beyond the later Ming dynasty. Before that date, such detail as there is in works like the Song-dynasty *Wujing Zongyao* (武經總要, Collection of the most important military techniques, 1044) is a matter of general description rather than of detailed specification.⁵¹

Similar comparisons may be made between what has been discovered by maritime archaeologists in China, where the maritime side of the science is still young,⁵² and maritime archaeology in the Western world. The number of completed wreck excavations in Chinese waters is remarkably small; while a good number of examples go back to before the common era, with some, including one of the world's oldest extant vessels, to the Neolithic, these are small craft like dugouts. From the secondary literature, it would seem that almost none are sea-going ships. Of the latter, very few excavated examples go back beyond the Song dynasty—two Tang dynasty (618–907) examples, neither sea-going nor large, are cited by McGrail⁵³—but those seem the only well-known ones to date. This is in marked contrast to what has been discovered of pre-steam vessels, especially medieval and earlier ship construction and proportions, from archaeological work in Europe. In Steffy's important work, for example, the earliest fully reconstructed example discussed is the royal ship of Cheops of 2650 BCE; from the

same millennium and territory come the details of the Saqqara shipwrights at work in the tomb of the courtier Ti. Bronze Age sea-going vessels of the twelfth or thirteenth centuries BCE are known from the eastern Mediterranean and northern Europe, as are several vessels from the middle and end of the first millennium BCE and the early centuries of the modern era.⁵⁴

In contrast to the plethora of Western examples, what we actually know in detail about the ships built by traditional Chinese shipwrights before, say, the mid-nineteenth century (and even that may be setting the date too far in the past), especially in terms of regional variations and with respect to changes through time, is small. What we actually know about their performance envelope is not great and has to be inferred from secondary and tertiary sources almost devoid of specific detail, since the practice of keeping detailed logbooks of voyages—given the systemic illiteracy of many in China's water world⁵⁵—never seems to have existed until the transformations in China's maritime world towards the end of the nineteenth century.

Seeing the *Keying*

The curious state of partial knowledge that has resulted has in its turn stood in the way of any accurate grasp of the shape, rig and construction of the *Keying*, as well as more or less ensuring that the extant depictions as much deceive as enlighten. It has also stood in the way not so much of the theoretical investigation of junk rig performance, which has been the subject of careful research using replicas and models, but of understanding how the rig worked in practice. Here the *Keying* is a vessel of singular significance.

Much the same deficiency exists, though perhaps to a lesser extent, in our knowledge of how Chinese ships were operated. Such evidence as there is appears in few sources, though its importance for understanding the great differences between the practices of the eighteenth- and nineteenth-century Western sea world and those which prevailed in China until the late nineteenth century, and possibly later still, is impossible to underestimate, especially when it comes to understanding the troubled voyage of the *Keying*.

As a final point in introducing the story of the *Keying*, the view of events that you will read is 'the view from the sea.' The maritime world is not the world of the

landsman—the lubber, as sailors dismissively say. In unravelling the story of the *Keying*, in reconstructing as best we can its voyage and onboard life, and in interpreting such documentary evidence as there is, we shall therefore be approaching matters from an unfamiliar direction, one necessarily dependent on its own specialist vocabulary and ways of seeing. This will apply in three ways.

First, we shall come at the evidence respecting the ship, its crew and the voyage from the point of view of someone versed in the maritime world and the conduct of a voyage. What might look like a clear statement of fact from the point of view of someone unfamiliar with the arcana of ships and the sea is often a startling alarm call to someone with more intimate knowledge. By way of illustration, and to choose a highly general example, one often reads of the vital contribution made by the ship's compass to both Chinese and Western voyaging in the fifteenth through eighteenth centuries. Yet once one knows the history of the compass and is aware of the enormous technical and theoretical hurdles that had to be leapt before truly accurate, stable and reliable magnetic steering compasses were a fixture on ships at sea—towards the end of the nineteenth century, shortly before the invention of the gyro-compass made magnetic compasses all but obsolete—it is immediately evident that any narrative about fifteenth-century voyaging that attributes accurate navigation to a ship's compass rests on a failure to understand how medieval ships actually did maintain direction.⁵⁶

In respect of the relationships between the ship's European and Chinese crew members, my focus will be less on the contrasts in everyday habits and mores that were such a distinct feature of the nineteenth century in the treaty ports, and more on the specific contrasts in shipboard organization and operation. Accordingly, running at the back of much of the discussion will be the vast contrasts that, despite the common endeavour of voyaging blue water, divided the world of the Western ship from that of the junk. There was the already large, and in the 1840s and '50s, rapidly increasing gulf between the regulatory environments in which Western shipping operated in terms of certification, ship-flagging, registration, surveying and measurement, safety equipment, and so on, and the less formal world of the junk trade. There was also the significant difference in complexity between the two types of vessel, and the starkly different approaches to order, hierarchy, organization and discipline that resulted, above

all in the comparative status of ships' officers vis-à-vis the rank and file and what might be expected in terms of deference and obedience.

Finally, if more nebulously, there will be an understanding of the contrasts in senses of self and of roles as between representatives of an increasingly hegemonic, proud and successful Britannia, for whom a life at sea was potentially a path to wealth and social advancement, and a group of people treated, although no longer officially, as 'mean people', for whom life at sea promised little save continuing as they were and avoiding starvation or worse, and who in addition had volunteered not only to work for the *fan kwae*⁵⁷ but to quit their native shores, without official permission, for foreign and barbarous parts.

Notes

Preface

1. Chinese bureaucrats—from a Portuguese root *mandar*, to command or order, influenced by a Sanskrit, via Hindi and Malay word *mantri* meaning ‘counsel/councilor’—were called *mandarins* and were strictly ranked, though exactly how varied by dynasty. In the mid-nineteenth century Qing, there were nine civilian and nine military ranks, each distinguished by a badge (補子, *bǔzi*) on the chest and a differentially coloured button on the top of the official hat (清代官帽, *Qingdai guanmao*).
2. For the jugglers, see *The Leeds Mercury*, 8 May 1847.
3. The *Kon Tiki* (1947); the *Mayflower* (1956–57); the *Ra* (1969–70); the *Tai-ki* (1974); the *Golden Hind* (1973–80); the *Hokulea* (1976–present); the *Sohar* (1980–81); the *Argo* (1984); the trireme *Olympias* (1985–94); the *Batavia* (1985–2000); the First Fleet (1987–88); the *Santa Maria* (1990–91); the *Hsu Fu* (1993); the *Endeavour* (1994–97); the *Matthew* (1997); *L’Hermione* (1997–present); the *Duyfken* (2000); the *Samudra Raksa* (2003–04); the nao *Victoria* (2005–07); the *Götheborg III* (2005–07); the *Godspeed*, *Susan Constant* and *Discovery* (2007); the *Sea Stallion* (2007–08); and the galleon *Andalucia* (2008–10) cover the relevant date range comprehensively enough to make the point.
4. This issue is explored more fully in Stephen Davies, ‘Maritime Museums: Who Needs Them?’, Nalanda-Sriwajaya Working Papers No.11 (Singapore: Nalanda-Sriwajaya Centre, Institute of South East Asian Studies, 2012) at http://nsc.iseas.edu.sg/documents/working_papers/nscwps011.pdf; and Stephen Davies, ‘Re-contextualizing the Prime Meridian: Interpreting Maritime Museum Collections for an Asian Audience’, paper presented at the 2011 Conference of the International Congress of Maritime Museums, Smithsonian Museum, Washington DC, 10 October 2011.
5. For an excellently told story that exhibits exactly this historical interment of the world of the Western hewers of wood, see Robert Bickers, *Empire Made Me: An Englishman Adrift in Shanghai* (New York: Columbia University Press, 2004).
6. Richard Henry Dana, Jr., *Two Years before the Mast: A Personal Narrative of Life at Sea*, edited by Homer Eaton Keyes (New York: Macmillan, 1939), preface, referring to

James Fenimore Cooper's sea story *The Red Rover: A Tale* (London: Henry Colburn, 1827), e-book at <http://www.authorama.com/book/two-years-before-the-mast.html>; accessed on 10 February 2013.

Introduction: Views from Different Seas

1. I shall use *junk* throughout this book to refer to the larger sea- and river-going Chinese vessels. It is a distinctly unsatisfactory term, either Javanese or Fujianese in origin, and as inadequately related to the Chinese vocabulary of ship and boat types as the equally unsatisfactory and etymologically errant *dhow* to the world of Arabic craft. Only its establishment in general English usage argues for it. It would be better to replace it with the generic English *ship*. See Pierre-Yves Manguin, 'The Southeast Asian Ship: An Historical Approach', *Journal of Southeast Asian Studies*, 11, no. 2 (1980): 266–76.
2. William Tarrant, *The Hongkong Almanack and Directory for 1846: With an Appendix* (Hong Kong: Office of the China Mail, 1846).
3. Remarkably little is known about Hong Kong's first Harbour Master: he has no entry in May Holdsworth and Christopher Munn (eds.), *Dictionary of Hong Kong Biography* (Hong Kong: Hong Kong University Press, 2011). Pedder was born in Ryde, Isle of Wight, in 1801 and joined the Royal Navy in 1814. His early service is not known, but in 1820 he joined HMS *Liffey* (50, 1813–1827; see Samantha Cavell, 'A Social History of Midshipmen and Quarterdeck Boys in the Royal Navy, 1761–1831', unpublished PhD thesis, University of Exeter, 2010, App. G7). He was made lieutenant in 1824 (see <http://www.pbenyon1.plus.com/Nbd/exec/OPQ/Index.html>; accessed on 9 February 2013). He obviously lacked influence, since he is next recorded in HM Coastguard 1836–39—traditionally a parking place for officers unable to get a berth in a serving naval vessel. There is record of his having contemplated developing a site—perhaps to build a house—at Bell Mead, Whippingham, Isle of Wight, in 1831, though negotiations were evidently broken off (see <http://www.nationalarchives.gov.uk/a2a/records.aspx?cat=189-jergps&cid=3-8&kw=Pedder,%20William#3-8>; accessed on 9 February 2013). We know that before joining the *Nemesis* and subsequently coming to Hong Kong, he had been married and had a son (*The Naval Chronicle*, vol. 7, 1838, p. 503: 'At Fleet, near Weymouth, on Monday 21st of May, the lady of Lt. W. Pedder, R.N., of a son.'). but whether his family ever came to Hong Kong is not known. Endacott notes that 'he proved an efficient officer (in Hong Kong) until his death at Ryde in the Isle of Wight in March 1854, while on home leave' (see G. B. Endacott, *A Biographical Sketch-Book of Early Hong Kong*, edited by John Carroll [Hong Kong: Hong Kong University Press, 2005], p. 109). His will was proved on 26 May 1854 (see <http://discovery.nationalarchives.gov.uk/SearchUI/details?Uri=D62453>; accessed on 9 February 2013).
4. The four images are *View of Hong Kong and the Harbour Looking West from Murray's Battery*, 1846; *View of Spring Gardens, 24th June 1846*; *View of Victoria: Looking West*

- from the Garden of the Honorable John Walter Hulme, Chief Justice, Hong Kong and View of Jardine Matheson's Looking North-West from Causeway Bay, 28th September 1846. They were part of a set of twelve views of Hong Kong made by Bruce in 1846 and subsequently published in c.1847 as lithographs by Maclure, Macdonald & Macgregor, Lithographers, London, the actual lithography being done by A. Maclure.
5. Frank Walsh, *A History of Hong Kong*, revised ed. (London: Harper Collins, 1997), pp. 124–5. As Walsh points out, settling the treaty that ended the First Opium War and established Hong Kong was a long drawn out process, ending only in October 1843, with the Supplementary Treaty of the Bogue.
 6. Walsh, *A History of Hong Kong*, p. 162.
 7. W. H. Smyth, *The Sailor's Word-book: An alphabetical digest of nautical terms, including some more especially military and scientific, but useful to seamen; as well as archaisms of early voyagers, etc.* (London: Blackie and Son, 1867). Smyth's word book was edited for publication by an early denizen of the Victoria Harbour waterfront, Captain Sir Edward Belcher.
 8. For the enduring look of traditional Chinese sail, see Stephen Davies, *Coasting Past: The Last South China Coastal Trading Junks Photographed by William Heering* (Hong Kong: Hong Kong Maritime Museum, 2013).
 9. G. S. Graham, *The China Station: War and Diplomacy, 1830–1860* (Oxford: Oxford University Press, 1978) and William Laird Clowes, *The Royal Navy: A History from the Earliest Times to the Present*, 7 vols. (London: Sampson, Low, Marston, 1901), vol. 7, pp. 351–3.
 10. 1,743-ton BM, two decks, 28 × 32 pdrs, 28 × 18 pdrs, 6 × 12 pdrs, 12 × 32 pdr carronades (short-range, brutal weapons), and 6 × 18 pdr carronades. See David Lyon and Rif Winfield, *The Sail & Steam Navy List: All the Ships of the Royal Navy, 1815–1889* (London: Chatham, 2004), Brian Lavery, *The Arming and Fitting of English Ships of War, 1600–1815* (Annapolis, MD: Naval Institute Press, 1989) and Brian Lavery, *The Ship of the Line: The Development of the Battlefleet 1650–1850* (London, Conway Maritime Press, 1984).
 11. War junks in this fleet seem to have been armed with only twelve or so six- to twelve-pounder guns. It would have required fourteen junks armed with 12 x 12 pdrs to equal the *Agincourt's* 'weight of metal', but none could have come even close to the massive hammer blow of a thirty-two-pound ball from even one thirty-two pounder. Chinese war junks were aimed at defensive dissuasion, not massive and relentless aggression. Bruce A. Elleman, *Modern Chinese Warfare, 1795–1989* (London: Routledge, 2001), pp. 19–34, and Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the 19th Century* (Oxford: Oxford University Press, 1981), Ch. 2.
 12. For a brilliant exposition on this huge complexity, see Trevor Kenchington, 'The Structures of English Wooden Ships: William Sutherland's Ship, c.1710', *The Northern Mariner/Le Marin du nord* 3, no.1 (1993): 1–43. Nothing significant had

- changed by 1846 except in the direction of greater complexity, with such niceties as diagonal bracing to further strengthen hulls against stresses.
13. A made mast is one constructed from more than one tree, each part shaped and fitted to the others with the whole being held together by rope or iron bands called woolding. Smyth, *The Sailor's Word-book*, s.v.
 14. Brian Tunstall and Nicholas Tracy (eds.), *Naval Warfare in the Age of Sail: The Evolution of Fighting Tactics, 1650–1815* (London: Wellfleet Press, 2001), Peter Padfield, *Guns at Sea* (London: St Martin's Press, 1974).
 15. Cavell, *A Social History of Midshipmen and Quarterdeck Boys in the Royal Navy*, pp. 254–338 and 450. The *French Wars* is a shorthand term for the French Revolutionary Wars, 1792–1802 and the Napoleonic Wars, 1803–15.
 16. It was claimed, for example, that it was a failure to understand Chinese signal flags that occasioned the fire from the British ships *Volage* and *Hyacinth* that began the First Opium War. E. H. Parker (ed.), *Chinese Account of the Opium War* (Shanghai: Kelley & Walsh, 1888), p. 11, '... the English mistook our red flags for a declaration of war, and opened fire;—for in Europe a red flag means war, and a white one peace' (this is a translation of the last two chapters of Wei Yuan [魏源, 1794–1857], *Sheng wu ji* [聖武記, Record of the military operations of the present dynasty]).
 17. Michael A. Palmer, *Command at Sea: Naval Command and Control since the Sixteenth Century* (Cambridge, MA: Harvard University Press, 2007), p. 210.
 18. Depending on when in 1846 we are looking out, this would either have been the *Minden*, an old third-rate or, when the *Minden* was sold for scrap, the hulked sixth-rate frigate *Alligator*.
 19. That means sail closer to the wind and thus work upwind faster than those styled less 'weatherly' vessels.
 20. The standard, if outdated, study, featuring an attitudes to things non-Western that has the power to shock, is Basil Lubbock's *The Opium Clippers* (Glasgow: Brown Son & Ferguson, 1933).
 21. Tonio Andrade, 'Was the European Sailing Ship a Key Technology of European Expansion? Evidence from East Asia', *International Journal of Maritime History* 23, no. 2 (Dec. 2011): 17–40.
 22. This was called Pitt's Passage, named after Captain Wilson's voyage on the Indiaman *Pitt* in 1759, though there is evidence the *Pitt* was not the first to try it. It involved a long detour via the Java Sea up through the Malukus and out through the straits north of New Guinea to the Pacific, whence east of the Philippines and to Macao via the Luzon Strait, enabling a vessel that arrived in the approaches to the China Seas too late in the southwest monsoon season to make Macao before the northeast monsoon swept in a chance not to lose a season.
 23. John Fincham, *A History of Naval Architecture: To Which Is Prefixed an Introductory Dissertation on the Application of Mathematical Science to the Art of Naval Construction* (London: Whittaker, 1851).
 24. John Fincham, *An Introductory Outline of the Practice of Shipbuilding, &c., &c.*, 2nd ed. (Portsea: William Woodward, 1825).

25. These are almost self-explanatory. Skin-first build creates a structure of joined outer planking fastened to the keel, bow and stern, and then reinforces it with a light internal framework. Frame-first constructs a rigid frame on the keel, bow and stern and then covers it with planks.
26. There were at least two versions of this booklet, published as by an anonymous author, but probably either written by Charles Kellett or ghostwritten to his narrative. The first version, Anon., *The Chinese Junk "Keying," being a full account of that vessel, with extracts from the journal of Capt. Kellett* (New York: Israel Sackett No. 1 Nassau Street, 1847), accompanied the exhibition of the ship in New York. I shall abbreviate this as the *Account*. The second version, which went into at least five editions (although it would be more accurate to call them reprints, since the contents do not substantially vary), Anon., *A Description of the Chinese Junk, "Keying," printed for the proprietors of the junk and sold only on board* (London: J. Such, 1848), is the better known and more extensive, though less informative as to the details of the voyage, especially in the early phases in the offing of the Sunda Strait. As noted in the text, I shall abbreviate this to the *Description*. A third pamphlet, not seemingly written by or ghosted for Charles Kellett, though this is uncertain, is *The Chinese Junk, "Keying" Descriptive Particulars; with an account of her voyage from China* (London: W. Marshall News Agent, Blackwall Railway, Fenchurch Street, n.d) with a steel engraving by J. T. Wood, Holywell St., Strand, which appears to have been used by Halliday for one of the medals, with some of Wood's detail omitted and the junk's mainsail looking like a trysail; see H. H. Brindley, 'The Keying', *The Mariner's Mirror* 8, no. 4 (1922): 305–14 and 308.
27. *Description*, p. 12.
28. Technically, a design envelope is the set of requirements that enable a design to perform as it is intended to perform in its given environment. The performance envelope—the expected capabilities of the design in a normal operating environment—is usually *within* the design envelope. It follows that the claim here is that, by good fortune, the design envelope that had emerged from a congeries of traditional Western shipbuilding practices by, say, the mid- to late fifteenth century far exceeded the performance envelope that was initially expected, thus allowing for the significant developments in ship design that accelerated through the sixteenth and seventeenth centuries and slowed during the eighteenth century, as the performance envelope reached the limits of the design envelope, given wooden ships and sail propulsion. As the *Keying* set sail, of course, that coincidence of envelopes was in the process of being blown asunder by the twin revolutions in ship design of iron and steam.
29. For an excellent overview of this pattern of development, see Richard W. Unger (ed.), *Cogs, Caravels and Galleons* (London: Brassey Publications, 1999).
30. One can always scale up or down (miniaturize or enlarge) any built object, provided one has the materials and tools. Whether the result works is an importantly related issue, without which 'scalability' is in practice meaningless. A truly 'scalable' design creates a design envelope that allows the design to be scaled up not only

- without loss of, but with enhanced functionality. See Stephen Davies, *Fathoming the Unfathomable: Even Leviathans Have Limits* (2005), an ebook available via www.1421exposed.com.
31. Consider Joel Mokyr, *The Gifts of Athena: Historical Origins of the Knowledge Economy* (Princeton, NJ: Princeton University Press, 2003). For a recent commentary on Mokyr's challenging thesis, see James Dowey, 'Mind over Matter: Empirical Evidence of the Industrial Enlightenment as the Origin of Modern Economic Growth', paper presented at London School of Economics Economic History PhD workshop, 25 January 2012, at <http://www2.lse.ac.uk/economicHistory/seminars/EH590Workshop/LT2012papers/dowey.pdf>; accessed on 11 March 2013.
 32. Deng Gang, *The Premodern Chinese Economy—Structural Equilibrium and Capitalist Sterility* (London: Routledge, 1999).
 33. I owe the idea of a vernacular architecture to Roger Scruton, *The Aesthetics of Architecture* (Princeton, NJ: Princeton University Press, 1980).
 34. Davies, *Fathoming the Unfathomable*, *passim*.
 35. This refers to a system of tonnage measurement prevailing in the Western world from the seventeenth to the mid-nineteenth century. The details are more fully explored in Part II. Tons burthen are a measure of internal capacity (volume), *not* of displacement (weight or mass). There is uncertainty as to the tonnage of the largest A-class junks of the *nanyang* trade.
 36. This means the mast is made of a single length of wood shaped from a single tree. They are sometimes referred to as *pole masts*, but for reasons of fascination only to devotees, this is not strictly correct.
 37. A gun or luff tackle is a four-part purchase rigged (rove) 'to advantage', which means, in this case of controlling a junk tiller, that there are five moving rope lengths at the tiller end of the tackle and four at the bulwark (ship's side) end. The gun/luff tackles in this use were also known in the West as relieving tackles, which was their purpose when conditions meant that the ship's wheel alone was insufficient to control the rudder.
 38. A bowsing tackle is a set of ropes leading from something that needs to be tightened—here the rudder against its mountings—to what does the tightening—here a fixed winch in the bow. This is in fact an interesting example of the co-optation of a Western term of art to a use inconceivable in Western naval architecture for which, strictly, it is ill suited. Chinese-English maritime dictionaries, especially when dealing with traditional craft, run head on into these problems of non-translatibility and the need to jury-rig existing terms.
 39. The aerodynamic potential of the rig was never technically explored or fully realized while junks were a living maritime tradition in China. For a modern take on the rig and its virtues, see H. G. Hasler and J. K. Macleod, *Practical Junk Rig: Design, Aerodynamics and Handling* (London: Adlard Coles, 1988), and the wide range of information available from the Junk Rig Association, <http://www.junkrigassociation.org>.

40. Joseph Needham, et al., *Science and Civilization in China*, 7 vols. (Cambridge: Cambridge University Press, 1974–2004); the number of separate books is twenty-seven.
41. Care is needed because of the relative paucity of archaeological detail and the ‘interpretability’ of documentary evidence. This means that we do not know much concrete, factual detail about Ming and pre-Ming dynasty ships. We know they appeared relatively large vis-à-vis some unspecified idea of European craft, but not exactly how much larger or in comparison to exactly what—medieval and Renaissance descriptive travelogues were not given to precise quantification.
42. J. Scott Russell, ‘On the Longitudinal System in the Structure of Iron Ships’, E. J. Reed (ed.), *Transactions of the Institution of Naval Architects*, vol. 3 (London: Institution of Naval Architects, 1862), pp. 160–71, the quotations are from pp. 162–3.
43. For a description of the system, see Sir Joseph Isherwood, ‘Economy in Modern Shipbuilding—II’, *Shipping: A Weekly Journal of Marine Trades*, 22 June 1918.
44. Charles Dickens, ‘The Chinese Junk’, *Examiner*, June 24 1848, p. 403. See also Elizabeth Hope Chang, *Britain’s Chinese Eye: Literature, Empire and Aesthetics in Nineteenth-Century Britain* (Stanford, CA: Stanford University Press, 2010), p. 115. For a very similar, though less technically based understanding of the differences here, see Catherine Pagani, ‘Objects and the Press: Images of China in Nineteenth-century Britain’, in *Imperial Co-Histories: National Identities and the British and Colonial Press*, edited by Julie F. Codell (Madison, NJ: Fairleigh Dickinson University Press, 2003), pp. 147–66, especially pp. 155–68, where the Dickens piece is also quoted.
45. Jerry Allen, *The Sea Years of Joseph Conrad* (London: Methuen, 1967).
46. See Nicholas Rodger’s eminent *The Wooden World: An Anatomy of the Georgian Navy* (London: Collins, 1986) and the work of Michael Lewis for the Royal Navy. For the merchant service, see Peter Earle, *Sailors: English Merchant Seamen 1650–1775* (London: Methuen, 1998). These two works are the tip of a vast iceberg that has been growing for several generations now, to strain a metaphor, as the snowfall of centuries of documentation is sifted and its findings accumulated.
47. *Lascar*, derived from the Persian *laskari*, meaning ‘soldier’, via the Portuguese *lascari* was a generic European term for Asian crew from the seventeenth century through to the twentieth, though generally referring to those from South Asia more than Southeast Asia or China. For a good introduction, see <http://www.lascars.co.uk/>; accessed on 1 August 2010. See also Janet J. Ewald, ‘Crossers of the Sea: Slaves, Freedmen, and Other Migrants in the Northwestern Indian Ocean, c.1750–1914’, *American Historical Review* 105, no. 1 (Feb. 2000): 69–91. See also Douglas Jones, ‘The Chinese in Britain: Origins and Development of a Community’, *Journal of Ethnic and Migration Studies* 7, no. 3 (Winter 1979): 397–402; Marika Sherwood, ‘Race, Nationality and Employment among Lascar Seamen, 1660 to 1945’, *Journal of Ethnic and Migration Studies* 17, no. 2 (Jan. 1991): 229–44; and Diane Frost (ed.), *Ethnic Labour and British Imperial Trade (Immigrants & Minorities)* (London: Routledge, 1995).

48. Drawings collectively known as the *Tosen no Zu*, sometimes called the Hirado Scrolls, which were completed by a Japanese artist working for the daimyo of Hirado in around 1795. The drawings of some dozen different Chinese and Southeast Asian trading vessels and one Dutch *retourschip* are elegant and exact, though not obviously to any scale, and all have careful measurements of key dimensions labelled. For a discussion of the dating and import of these drawings, see Oba Osamu, 'On the Scroll of Chinese Ships in the Possession of the Matsuura Museum—Materials for the Study of Chinese Trading Ships in Edo Period', *Bulletin of the Institute of Oriental and Occidental Studies of Kansai University* 5 (March 1972): 13–50.
49. G. R. G. Worcester, *The Junks and Sampans of the Yangtze* (Annapolis, MD: Naval Institute Press, 1971); the first edition was published in Shanghai by the Chinese Imperial Maritime Customs in 1940; G. R. G. Worcester, *Sail and Sweep in China: The History and Development of the Chinese Junk as Illustrated by the Collection of Models in the Science Museum* (London: HMSO, 1966).
50. A possible exception might be the *Longjiang Shipyard Treatise* (*Longjiang chuan-chang zhi* [龍江船廠志]) of 1553 by Li Zhaoxiang (李照祥), for my knowledge of which I am indebted to Sally K. Church, 'Nanjing's *Longjiang Shipyard Treatise* and Our Knowledge of Ming Ships', research in progress financed by the Golden Web Foundation and kindly made available to me by her, which looks *inter alia* at Hans Lothar Scheuring, *Die Drachenfluß-Werft von Nanking: Das Lung-chiang ch'uan-ch'ang chih, eine Ming-zeitliche Quelle zur Geschichte des chinesischen Schiffbaus*, Heidelberger Schriften zur Ostasienkunde, Band 9 (Frankfurt: Haag und Herchen, 1987). This is a translation into German of the treatise.
51. Sean McGrail, *Boats of the World from the Stone Age to Medieval Times* (Oxford: Oxford University Press, 2001), p. 349, where McGrail quotes Yang Yu, 'On the Study of Ancient Sailing Ships', from S. Zhang (ed.), *Proceedings of the International Sailing Ship Conference* (Shanghai: Society of Naval Architecture and Marine Engineering, 1991), contending exactly this point.
52. The first Chinese maritime archaeology unit, under the auspices of the Underwater Archaeological Centre at the National History Museum of China, was established only in 1990 with the assistance of Australian specialists; see *China Heritage Newsletter*, No. 1 (March 2005), at <http://www.chinaheritagequarterly.org/editorial.php?issue=001>; accessed on 16 August 2010.
53. *Ibid.*, p. 361.
54. J. Richard Steffy, *Wooden Shipbuilding and the Interpretation of Shipwrecks* (College Station: Texas A&M University Press, 1994), Ch. 3. See also Lionel Casson's encyclopaedic *Ships and Seamanship in the Ancient World* (Baltimore: Johns Hopkins University Press, 1995).
55. 'Systemic' because there is evidence that few Chinese sailors and shipwrights were literate. This was a direct function of the lowly and excluded status of sea people—the core of the maritime world—in traditional Chinese society. This is not to say that all were illiterate. There is ample evidence that was not true. What appears to be missing in China's maritime tradition as a result is that stratum of literate observers

and theorizers that one finds emerging in the Western world around the fifteenth century and then growing in sophistication and importance through the following four centuries until, in the nineteenth century, a full-fledged and theorized naval architecture had come into being.

56. J. E. D. Williams, *From Sails to Satellites: The Origin and Development of Navigational Science* (Cambridge: Cambridge University Press, 1993); A. E. Fanning, *Steady as She Goes: A History of the Compass Department of the Admiralty* (London: HMSO, 1986); Alan Gurney, *Compass: A Story of Exploration and Innovation* (New York: W. W. Norton, 2004).
57. *Fan kwae* (番鬼, *fangui* in pinyin) or ‘foreign ghost’ was a mildly derogative term for foreigners in the mid-nineteenth century, equivalent to the modern Cantonese *gweilo* (鬼佬).

Chapter 1 Origins, Purchase and Commissioning

1. Contemporary news stories state the *Keying* carried no cargo to avoid having to pay duty; see *inter alia* *Daily News*, 26 August 1847, and *The Morning Chronicle*, 11 March 1848.
2. See John Rogers Haddad, *The Romance of China: Excursions to China in U.S. Culture, 1776–1876* (New York: Columbia University Press, 2004), Ch. 4, and the same author’s more recent essay, ‘China of the American Imagination: The Influence of Trade on U.S. Portrayals of China, 1820–1850’, in *Narratives of Free Trade: The Commercial Cultures of Early US-China Relations*, edited by Kendall Johnson (Hong Kong: Hong Kong University Press, 2011).
3. See, for a slightly different view, Catherine Pagani, ‘Objects and the Press: Images of China in Nineteenth-Century Britain’, in *Imperial Co-Histories: National Identities and the British and Colonial Press*, edited by Julie F. Codell (Madison, NJ: Fairleigh Dickinson University Press, 2003), p. 154.
4. William Langdon, *Ten Thousand Things Relating to China and the Chinese: An Epitome of the Genius, Government, History, Literature, Agriculture, Arts, Trade, Manners, Customs, and Social Life of the People of the Celestial Empire* (London: G M’Kewan, 1842). Langdon himself had spent time in China, where he and Nathan Dunn had been acquainted. Interestingly, there is considerable commonalty between Langdon’s catalogue and a predecessor, see Enoch Cobb Wines, *A Peep at China in Mr. Dunn’s Chinese Collection; with Miscellaneous Notes Relating to the Institutions and Customs of the Chinese and Our Commercial Intercourse with Them* (Philadelphia: Printed for Nathan Dunn, I Ashmead & Co, Printers, 1839).
5. Dunn had been assisted in amassing his collection by ‘Howqua, Tingqua, and other Hong merchants of note’ (*The Illustrated London News*, 3 December 1842, p. 469). On the close relationship between Dunn and Tingqua, and Tingqua’s role in saving Dunn from ruin in the great fire in Canton in November 1822, see Haddad, *The Romance of China*, Ch. 4.

6. Langdon, *ibid.*, pp. 269–73.
7. *Ibid.*, pp. 272–73.
8. Another has 129 separate entries.
9. Anon., *A Description of the Chinese Junk, "Keying", printed for the proprietors of the junk and sold only on board* (London: J. Such, 1848), p. 29.
10. Or with any mention of the certainty that the investors in the *Keying* project were probably—and, in the case of Douglas Lapraik, certainly—heavily involved in the illegal smuggling of opium into China.
11. Zhaojin Ji, *A History of Modern Shanghai Banking: The Rise and Decline of China's Finance Capitalism* (New York: M. E. Sharpe, 2003), p. 45.
12. No one can read Robert Bickers's recent and excellent *The Scramble for China: Foreign Devils in the Qing Empire 1832–1914* (London: Penguin Books, 2011) without being struck by the levels of casual violence that often characterized life at sea at this time; one notes especially a voyage by a lorch from Hong Kong to Shanghai in 1848, when 'during the whole passage the Master was constantly firing on every Native craft, without distinction' (pp. 106–7). See also Christopher Munn, *Anglo-China, Chinese People and British Rule in Hong Kong, 1841–1880* (Hong Kong: Hong Kong University Press, 2009), Chs. 3 and 7, and his discussion of the problem of piracy.
13. The data on Charles Kellett's birth and experience comes from his Master's Certificate of Service lodged in the National Maritime Museum, Greenwich and placed online by Ancestry.com (http://search.ancestry.co.uk/cgi-bin/sse.dll?db=GBMastersCertificates&rank=1&new=1&so=3&MSAV=0&msT=1&gss=ms_db&gsfn=Charles+Alfred&gsln=Kellett&msbdy=1818&msbpn__ftp=Plymouth&dbOnly=_F80062DE%7C_F80062DE_x&uidh=000, accessed on 1 May 2013). I owe this information to Charles Kellett's great-great-granddaughter Susan Simmons and her cousin Drummond Corrie.
14. No trace of Charles Kellett's sea service can be found until the Master's Certificate of Service of 1851 where it states that Kellett 'Has been employed in the Capacities of Boy, Mate & Master 17 years in the British Merchant Service in the Foreign Trade'. A system of voluntary examinations for masters and mates of foreign trade vessels had been introduced by the Board of Trade in 1845. Before that only relatively informal records exist and Charles Kellett's name does not appear in the 1.6 million record in the British National Archives, searchable online at http://www.findmypast.co.uk/search/merchant-navy-seamen/results?event=S&locale=en&recordCount=-1&otherDataSet=2%3A41&forenames=CHARLES+Alfred&includeForenamesVariants=true&_includeForenamesVariants=on&surname=KELLETT&includeSurnameVariants=true&_includeSurnameVariants=on&county=DEV&place=Plymouth&birthYear=1818&birthYearTolerance=1&keyWord=# (accessed on 1 May 2013). We shall revisit this issue in Chapter 7.
15. For details on Lapraik, I am indebted to P. Hansell, 'The Colourful Douglas Lapraik (1818–1869)', *Antiquarian Horology* 27, no. 3 (2003): 331–2; a later note in the same journal by Mark Macalpine furnishes details of Lapraik's status as a freemason

- in Hong Kong's Zetland Lodge, where Lapraik was treasurer in 1856 and 1857. See also Bernard North, 'Watch and clockmakers of Hong Kong', *Antiquarian Horology* 32, no. 2 (2010): 180–2.
16. William Tarrant (*The Hongkong Almanack and Directory for 1846: With an Appendix*, Hong Kong: Office of the China Mail, 1846, p. 40) has a different take, in that he has Leonard Just, Sr. running a watch and chronometer maker in Queen's Road, and Leonard Just, Jr. running the shop in D'Aguiar Street with Douglas Lapraik and George Saunders working for him.
 17. North, 'Watch and Clockmakers of Hong Kong', pp. 179–80.
 18. The company still trades today as one of Hong Kong's Admiralty chart agents (George Falconer [Nautical] Ltd.). The upmarket jeweller in the Peninsula Hotel, Falconer Jewellers, is now a separate concern, though it boasts a founding date of 1855, so is clearly connected (see <http://www.falconer.com.hk/eng/profile.html>).
 19. May Holdsworth and Christopher Munn (eds.), *Dictionary of Hong Kong Biography* (Hong Kong: Hong Kong University Press, 2011), entry for Thomas Ash Lane and kin.
 20. Tarrant, *The Hongkong Almanack and Directory*, p. 40.
 21. Holdsworth and Munn, *Dictionary of Hong Kong Biography*.
 22. There are only two Burtons in *The Mercantile Navy List* for 1850, Frederick John and Henry, so like his skipper, G. Burton rested his case for rank on time, not formal qualification. Sixty G. Burtons born between 1805 and 1825 appear in the pre-1845 British records of merchant seamen (<http://www.findmypast.co.uk/search/merchant-navy-seamen/results?e=S&bY=1825&bYT=10&iSnV=true&sn=BURTON&fns=G&snNXF=true&oDS=2:41&rC=192&nOffset=50>, accessed on 1 May 2013).
 23. There is only one Revett in *The Mercantile Navy List*; Richard Revett. No Edward Revett appears in the pre-1845 records of merchant seamen. Only four Revetts are listed, two Benjamins, a George and a William (http://www.findmypast.co.uk/search/merchant-navy-seamen/results?event=S&locale=en&recordCount=-1&otherDataSet=2%3A41&forenames=&includeForenamesVariants=true&_includeForenamesVariants=on&surname=REVETT&includeSurnameVariants=true&_includeSurnameVariants=on&county=&place=&birthYear=1825&birthYearTolerance=5&keyWord=, accessed on 1 May 2013). The quarterdeck of the *Keying* was in no way reflective of the revolution in the standards of ship manning that had begun in 1845; see the notice setting out the formal position in *ibid.*, pp. 13–9. Some sources give Revett's first name as one beginning with 'S', however, New York newspaper reports state Edward.
 24. *Register of American and Foreign Shipping 1895*, p. 625, at <http://library.mysticseaport.org/initiative/ShipPageImage.cfm?PageNum=3&BibID=179721895&Series=Introduction&Chapter=>; accessed on 5 August 2010.
 25. E. J. Eitel, *Europe in China: The History of Hong Kong from the Beginning to the Year 1882* (Taipei: Cheng-Wen Publishing Co., 1968), Chs. 13 and 14.

26. This shift, roughly from admiration to denigration, and later to evident Sinophobia, is well canvassed by Haddad, 'China of the American Imagination'; see also Bickers, *The Scramble for China*, p. 37.
27. Bickers makes a similar point about Shanghai (*The Scramble for China*, pp. 131–2). See also John M. Carroll, *Edge of Empires: Chinese Elites and British Colonials in Hong Kong* (Hong Kong: Hong Kong University Press, 2007), pp. 41–2, citing Robert Montgomery Martin (colonial treasurer), Robert Fortune, Oswald Tiffany, the *Economist*, Rev. George Smith, Rev. Karl Gutzlaff and J. M. Tronson. Carroll gives a very clear picture of Hong Kong's rapsallion world.
28. Published by Rock Brothers and Payne, 11 Walbrook, London, on 20 May 1848. This shows the *Keying* as she appeared 'off Gravesend on 28th March, 1848, 477 days from Canton'.
29. Correctly and incorrectly, because etiquette requires the flying of the merchant ensign of one's host country, not its national flag. Things were somewhat more fluid in the 1840s; in any case, jobbing artists often paint what they think they ought to be seeing, not what is there—as we shall see when we come to consider more fully in Part II the popular images of the *Keying* published in her lifetime.
30. The nearest to be found on the standard vexillologist's website are what are described as Beijing 'drum and bell tower flags' (see http://www.crwflags.com/fotw/flags/cn_be.html).
31. For a very full discussion, see Mark C. Elliott, *The Manchu Way: The Eight Banners and Ethnic Identity in Late Imperial China* (Stanford, CA: Stanford University Press, 2001).
32. Haddad, 'China of the American Imagination', Ch. 5.
33. The trade dollar used in the China trade (basically the Mexican peso) and the US dollar were at this time more or less of the same value; see Maria Alejandra Irigoin, 'A Trojan Horse in 19th Century China? The Global Consequences of the Breakdown of the Spanish Silver Peso Standard', at <http://www.lse.ac.uk/collections/economicHistory/seminars/Irigoin.pdf> www.lse.ac.uk/collections/economicHistory/seminars/Irigoin.pdf.
34. See K. C. Liu, *Anglo-American Steamship Rivalry in China, 1862–1874* (Taipei: Rainbow Bridge Book Co., 1962), p. 51. The Haekwan tael, a 'virtual' accounting value used by the Imperial Chinese Maritime Customs, was worth US\$1.45 at that time; see Man-houng Lin, *China Upside Down: Currency, Society, and Ideologies, 1808–1856* at www.fas.harvard.edu/~asiactr/publications/pdfs/Lin%20Front%20Matter.pdf, so a small, 'old' steamer of 456 tons cost US\$45,000 in 1861 and a fairly new steamer in 1865 cost US\$108,000. This suggests the 'anonymous American' story was a canard, the price cited was false or that Kellett and Lapraik were unbelievably credulous.
35. See Melvin Maddocks, *The Atlantic Crossing* (Alexandra, VA: Time-Life Books, 1981), p. 88.
36. *The Northern Star and National Trades' Journal* (Leeds, England), 3 April 1847.
37. *Hampshire Telegraph and Sussex Chronicle*, 13 February 1847.

38. *Liverpool Mercury*, 26 February 1847.
39. *Manchester Times and Gazette*, 26 February 1847.
40. Anon., *The Chinese Junk "Keying", being a full account of that vessel, with extracts from the journal of Capt. Kellett* (New York: Israel Sackett No. 1 Nassau Street, 1847), p. 4.
41. *Caledonian Mercury*, 22 March 1847; *Preston Guardian*, 27 March 1847; *Aberdeen Journal*, 31 March 1847; *Derby Mercury*, 31 March 1847. The dating suggests one source copied on.
42. A fair inference from the *New York Tribune* story.
43. *Description*, pp. 23–31.
44. The only *Keying* in the contemporary register was an American brig, built in Newburyport in 1845 for J. N. & W. Cushing and working out of Boston almost certainly in the China trade. The Cushings had been prominent in the American China trade from the earliest years, the well-known John Perkins Cushing having been a founder member of Perkins and Co., which in 1827 consolidated with Russell and Co., for which Robert Bennett Forbes worked and whom we shall meet later in the story. From the papers in the Library of Congress of Caleb Cushing, America's first envoy to China, it is clear that J. N. Cushing was a relative (see Special Correspondence, 1817–1899, n.d., Box 144). The *Keying* remained on the register until 1874, having been sold in 1865 to R. W. Cameron of Sydney, Australia, and in 1870 to an unknown owner in Hamburg, Germany.
45. Bickers, *The Scramble for China*, p. 157. At the time of the incident, the *Arrow's* registration had in fact expired. Ill-timed, given the very recently ended Crimean War and the close-to-simultaneous outbreak of major civil disturbance in India. See also Samuel Wells Williams, *A Chinese Commercial Guide, consisting of a collection of details and regulations respecting foreign trade with China, sailing directions, tables, etc.*, 4th ed. (Canton: The Chinese Repository, 1856), p. 244, where the form of the new 'Certificate of British Registry' is shown and is revelatory of the fairly casual approach to such matters at this date.
46. *Account*, p. 8.
47. There is a well-known lithograph, based on an original painting by George Chinnery, of Charles Gützlaff, the Pomeranian missionary and linguist dressed in disguise as a Fujianese mariner. If the portrait is accurate (for the heavily mustachioed Gützlaff looks like nothing so much as a character in an opera about Levantine piracy), then it seems unlikely any disguises contrived by Europeans would have been very convincing. No doubt with their characteristic generosity towards the odder conceits of Westerners and their fidelity to the terms of a deal they had agreed, the Chinese people involved in this charade went along with the 'these aren't Westerners' game to save everyone's face.
48. Paul A. van Dyke, *The Canton Trade: Life and Enterprise on the China Coast, 1700–1845* (Hong Kong: Hong Kong University Press, 2005), especially Chs. 1 and 2.
49. *Account*, p. 4: 'She was purchased . . . after she had returned from Cochin China, to which country she had carried some Mandarins of high rank.'

50. Van Dyke, *The Canton Trade*, pp. 145–50.
51. That this was not mere racist fantasy but possibly a rational prudence is evident from the tales of such crew takeovers of European-officered vessels in Grace Fox, *British Admirals and Chinese Pirates, 1832–1869* (London: Kegan Paul, 1940), and the 1855 story of the fate of Captain Rees of the Ningbo barque *Psyche*: ‘At Changzhou the Singapore-born mate was seized and thrown overboard by the Chinese crew. As he surfaced and before making his way to shore, he saw Rees stabbed on deck, and his body dumped into the river down which it floated, his blood leaking steadily out into Chinese waters.’ Bickers, *The Scramble for China*, pp. 133–4.
52. *Chunam* is an Anglo-Indian word; see H. Yule and A. C. Burnell, *Hobson-Jobson: The Anglo-Indian Dictionary* (London: Wordsworth 1999 [1886]), s.v., where, interestingly, the noun refers solely to powdered lime. In China coast use, it tends to refer to two things: a coarse plaster used to render slopes and outside surfaces (in *Hobson-Jobson*, this only appears in verbal form as the substance used when one ‘chunams’) and a composition for marine use made of oil, fibre and lime. In the Chinese case—the Chinese term *yóushíhuī* (油石灰) means ‘(tung) oil lime’—the compound used crushed, burned seashells, tung (or, as often, colza) oil and bamboo fibre. When used as a bottom treatment, *chunam* was made from just the lime and tung oil and is what gives the characteristic bluish-grey white colour to the bottoms of junks in Chinese export paintings of the eighteenth and nineteenth centuries.
53. *The Belfast News-Letter*, 26 May 1848.
54. Reported in the British *The Northern Star and National Trades’ Journal*, 3 April 1847.
55. For their un-Chineseness see Davies, *Coasting Past*, op. cit., pp. 55–6.
56. The available cargo volume in the *Keying* was roughly 650 to 700 cubic metres. The volume of around 100 tonnes of stores and household goods, which are not very dense, would be between 160 and 180 cubic metres. Calculations like these are run-of-the-mill for ship’s officers, utilizing known tables of what are called ‘stowage factors’, expressed in cubic metres per metric tonne. See Maritime Cargo Transport Conference, *Inland and Maritime Transportation of Unitized Cargo: A Comparative Economic Analysis of Break-Bulk and Unit Load Systems for Maritime General Cargo from Shipper to Consignee*, Publication 1135 (Washington: National Academy of Sciences/National Research Council, 1963), p. 6, and Appendix B, pp. 57–8.
57. The modern term is 壓載 (*yāzài*).
58. *The Illustrated London News*, 1 April 1848, p. 222.

Chapter 2 The Ship’s Name

1. Paul van Dyke, personal communication. See also Paul van Dyke, *Merchants of Canton and Macao: Politics and Strategies in Eighteenth-Century Chinese Trade* (Hong Kong: Hong Kong University Press, 2011), Ch. 4.
2. Probably Tian Hou (天后), queen of heaven, and her two acolytes Shùnfēng’ěr (順風耳), ‘Favourable wind ears’, and Qiānlǐyǎn (千里眼), ‘Thousand league eyes’.

3. Anon., *The Chinese Junk "Keying," being a full account of that Vessel, with extracts from the journal of Capt. Kellett* (New York: Israel Sackett No. 1 Nassau Street, 1847), p. 10.
4. Fang Chaoying in A. W. Hummel (ed.), *Eminent Chinese of the Ch'ing Period (1644–1912)* (Washington: Library of Congress, 1943), pp. 130–4, gives a different ancestry, tracing Qiying back to Nurhaci's brother, not Nurhaci himself. The vexed matter of romanizing Chinese now seems to have settled with hanyu pinyin—though even the use or not of diacritical marks is a moving feast—but that is an achievement only of the last twenty years or so. Qiying's name accordingly appears in a number of forms, depending on whom one is quoting; thus, *Qiyang*, *Ch'i-yang*, *Kiyang*, and *Keying*. In this work, we shall stick with *Qiying* for the person and *Keying* for the ship.
5. *The Belfast News-Letter*, 26 May 1848; Anon., *A Description of the Chinese Junk, "Keying", printed for the proprietors of the junk and sold only on board* (London: J. Such, 1848), p. 10.
6. I owe my understanding of the Chinese characters that appear in the *Description* to my one time colleagues Ms. Catalina Chor, Ms. Moody Tang, Ms. Phoebe Tong and Ms. Jamie Mak.
7. *Account*, p. 12.
8. J. K. Fairbank, *Trade and Diplomacy on the China Coast: The Opening of the Treaty Ports 1842–1854* (Cambridge, MA: Harvard University Press, 1964), pp. 92–3.
9. Robert Bickers, *The Scramble for China: Foreign Devils in the Qing Empire, 1832–1914* (London: Penguin Books, 2011), p. 110.
10. The majority view—there were dissenters like *The Times* of London, which labelled the British fleet 'this engine of evil'—is admirably summarized in Bickers, *The Scramble for China*, pp. 109–12. *The Times* quotation is from Bickers, p. 83, citing p. 4 of the 22 November 1842 issue.
11. Bickers, *The Scramble for China*, p. 110. He remained plain Frederick Pottinger and came to a sad end as a dismissed New South Wales policeman who accidentally shot himself in the stomach while boarding a stage-coach on his way to plead the justified and widely supported case against his dismissal; "The late Sir Frederick Pottinger, Bart., *Sydney and Sporting Chronicle*, 15 April 1865, p. 2.
12. M. Levien (ed.), *The Cree Journals: The Voyages of Edward H. Cree, Surgeon R.N., as Related in His Private Journals, 1837–1856* (Exeter: Webb & Bower, 1981), p. 122.
13. *Ibid.*, pp. 122 and 176–7.
14. Fairbank, *Trade and Diplomacy on the China Coast*, p. 270, fn c.
15. Frederic Wakeman, Jr., *Strangers at the Gate: Social Disorder in South China 1839–1861* (Berkeley: University of California Press, 1966) is an excellent guide on Cantonese attitudes to Westerners, particularly the British.
16. *Ibid.*, p. 113.
17. The references to Chinese culture in both *Account* and *Description* are uniformly belittling. The *Account's* terse summary of Chinese culture is representative: "Their histories are fables, their romances silly and pointless, their poems unintelligibly imaginative, and their drama, though representing nature, are revolting" (p. 11).

Chapter 3 The Crew and the Voyage to New York

1. William Shakespeare, *King Henry V*, Act IV, scene 3. This is Henry's laconic one-liner between his brilliant set piece 'We band of brothers' and 'Dying like men' speeches in the English camp before the Battle of Agincourt. For the relevance of this, see Richard W. Schoch, *Shakespeare's Victorian Stage: Performing History in the Theatre of Charles Kean* (Cambridge: Cambridge University Press, 1998), esp. pp. 10 and 46.
2. The documentation is hopelessly confused. The *Account* notes only (p. 7) that to sail the *Keying* 'takes 40 men'. The *Description* (p. 6) claims '30 natives and 12 English seamen, with the officers', various newspaper reports have fifty Chinese crew. Given that twenty-six were repatriated from New York and another group left the ship in Boston, a number like forty solves the problem of the crewing of the junk across the Atlantic. Were there only to have been thirty, and twenty-six left the ship in New York and more in Boston, then the question of who took the ship across the Atlantic becomes a problem, as does the provenance of the 'performers' who were the core of the display when the ship reached London.
3. John Dickie, *The British Consul: Heir to a Great Tradition* (New York: Columbia University Press, 2007), p. 85, 'At Whampoa, an outpost 12 miles from Canton where the British community comprised three shipwrights, two surgeons, a master mariner, a ship's chandler and a clerk, the Vice-Consul had to make do with a floating consulate berthed near some shacks locally known as Bamboo Town where sailors spent their time ashore.' The vice-consul at this time, c. 1846, was Alec Bird. See also Mrs H. Dwight Williams, *A Year in China and a Narrative of Capture and Imprisonment When Homeward Bound, on Board the Rebel Pirate Florida* (New York: Hurd & Houghton, 1864), Ch. 7. Explanations of why it was called Bambootown vary.
4. See Erastus C. Benedict, *The American Admiralty Law: Its Jurisdictions and Practice with Practical Forms and Directions* (New York: Banks, Gould & Co, 1850), appendix, Practical Forms, 'No. 96 Libel in rem by the seamen of a Chinese junk for wages, expenses, and passage money home', pp. 496–8.
5. *Caledonian Mercury* (Edinburgh, Scotland), 22 March 1847.
6. For a discussion of the traditional system of junk operation, see Koizumi Teizo, 'The Operation of Chinese Junks', in *The Evolution of Traditional Shipping in China*, edited by Mark Elvin, translated by Andrew Watson (Ann Arbor: Centre for Chinese Studies, University of Michigan, 1972).
7. This was still the practice in Hong Kong-crewed ships until the 1950s. Thereafter, following an ILO resolution, the Hong Kong government insisted on a 'Westernized' crewing system; Stephanie Zarach, *Changing Places: The Remarkable Story of the Hong Kong Shipowners* (Hong Kong: Hong Kong Shipowners' Association, 2007), p. 162.
8. This, like so many such terms from an almost exclusively oral tradition, is hard to pin down in modern Chinese.

9. Pronounced (and sometimes spelled) ‘bosun.’ It is the oldest title of rank in English speaking navies and in the twelfth century meant the ship’s captain.
10. Vernon Young, ‘Lingard’s Folly: The Lost Subject’, *The Kenyon Review* 15, no. 4 (Autumn 1953): 522–39.
11. Joseph Conrad, *The Rescue* (London: Penguin Books, 1985 [1920]), p. 22.
12. *Ibid.*, p. 25.
13. *Ibid.*, p. 33. *Malim* is an honorific in Malay and here refers to the chief mate, Shaw.
14. The source of the doubt is an op-ed piece in the Edinburgh-published *Caledonian Mercury*, 25 September 1851, citing information from ‘our Victoria (Hong Kong) contemporary’ that He Sing, far from being a mandarin, ‘is . . . or rather was, a ship-painter in Whampoa reach’.
15. For example, the name does not appear on the extensive list at <http://freepages.family.rootsweb.ancestry.com/~chinesesurname/x.html#X> (accessed on 10 February 2013), nor in most lists of the nine surnames romanized as Xi.
16. We shall be considering the court case more fully in Pt. I, ‘The Troubled Stay in New York’.
17. John Rogers Haddad (*The Romance of China: Excursions to China in U.S. Culture, 1776–1876*, New York: Columbia University Press, 2008) gives this information, citing variously the *Boston Daily Advertiser* (2 November 1847) for the American originator, *Niles National Register* (7 August 1847) for the price Kellett paid and *The Chinese Repository* (December 1846) for the details of the crew contracts, although the relevant issue seems only to note that the vessel left Hong Kong with about sixty crew, half Chinese and half European. Kellett’s version is quoted as appearing in the *London Morning Chronicle* (n.d.) and reprinted in Holden’s *Dollar Magazine* (April 1848).
18. Benedict, *American Admiralty Law*, p. 497, first allegation.
19. Probably today’s Zhoushan (舟山).
20. Haddad, *Romance of China*.
21. See Henry Wise, *An Analysis of One Hundred Voyages to and from India, China, &c. performed by ships in the honourable East India Company’s service; with remarks on the advantages of steam-power applied as an auxiliary aid to shipping; and suggestions for improving thereby the communication with India, via the Cape of Good Hope* (London: J. W. Norie & Co and W. H. Allen, 1839).
22. The ‘Lascar Act’, as this law was known, further entrenched a radical difference between ‘lascar’ and all other crew that had first been made law in 1814. The law of 1814 and its 1823 successor distinguished between seamen who were British citizens and lascars who were not. It is instructive that this act was not repealed until 1963.
23. See Jonathan S. Kitchen, *The Employment of Merchant Seamen* (London: Croom Helm, 1980), pp. 179–81.
24. See Rosina Visram, *Asians in Britain: 400 Years of History* (London: Pluto Press, 2002), Ch. 2. Visram’s book is primarily about lascars from the subcontinent, but

- the same rules generally applied to Southeast Asian and Chinese crew, who from the point of view of the law were also lascars.
25. On Hong Kong's contemporary Chinese population, see, for example, J. K. Fairbank, *Trade and Diplomacy on the China Coast: The Opening of the Treaty Ports 1842–1854* (Cambridge, MA: Harvard University Press, 1964), pp. 219–23, and E. J. Eitel, *Europe in China: The History of Hong Kong from the Beginning to the Year 1882* (Taipei: Cheng-Wen Publishing Co., 1968), p. 221 *passim*.
 26. John M. Carroll, *Edge of Empires: Chinese Elites and British Colonials in Hong Kong* (Hong Kong: Hong Kong University Press, 2007), pp. 41–2, citing Robert Montgomery Martin (the colonial treasurer), Robert Fortune, Oswald Tiffany, the *Economist*, Rev. George Smith, Rev. Karl Gutzlaff and J. M. Tronson. See also Christopher Munn, *Anglo-China: Chinese People and British Rule in Hong Kong, 1841–1880* (Hong Kong: Hong Kong University Press, 2009), Ch. 2.
 27. *Daily News*, London, 9 April 1849.
 28. Basil Lubbock, *The Opium Clippers* (Glasgow: Brown, Son & Ferguson, 1933).
 29. *Glasgow Herald*, 16 July 1847; *Hampshire Telegraph & Sussex Chronicle, etc.*, 10 July 1847; *Bristol Mercury*, 17 July 1847.
 30. A nautical mile is 1,852 metres and equals one minute of arc of a meridian (or one minute of latitude). It is also known as a knot, after the old method of measuring a ship's speed using a timed, knotted log line. The number of knots in the line counted in 28 seconds was the ship's speed. Hence speed at sea is known as knots, or knots per hour, though that locution is thought today to be rather unnautical.
 31. Northeast/northwest because as the northeast monsoon winds near the Equator, they weaken and begin backing northerly, eventually backing some 90 degrees by around 5 to 10° S to blow northwest.
 32. A pilot (US) or routeing (UK) chart is a special chart for each month for a large sea area like the Indian Ocean or South Atlantic, divided into large, roughly 10,000-square-mile squares, within which are plotted the average wind speeds and directions that can be expected in that area during that month of the year. In Charles Kellett's day, these boons to the passage planner were just emerging, the product of the energy and vision of Lt. Matthew Maury. USN, whose first 'Wind and Current Chart for the North Atlantic' was produced in 1847.
 33. Jose Maria Tey, *Hong Kong to Barcelona in the Junk Rubia* (London: Harrap, 1962), pp. 18–25. The claim of force ten winds is almost certainly over-egging the cake, possibly at the publisher's suggestion. Infamously, it was the publisher who required the 'spicing up' of John Caldwell's *The Desperate Voyage* (New York: Little Brown, 1949).
 34. A hardwood from the dipterocarp *Hopea* species found throughout Southeast Asia and known as *yakal* in the Philippines and Hong Kong; see H. G. Richter and M. J. Dallwitz, 'Commercial Timbers: Descriptions, Illustrations, Identification, and Information Retrieval', Version: 4 May 2000, <http://biodiversity.uno.edu/delta/>; accessed on 10 February 2013.

35. Brian Clifford and Neil Illingworth, *The Voyage of the Golden Lotus* (London: Herbert Jenkins, 1962), Ch. 6.
36. We know this from the shipping intelligence column of *The Morning Chronicle* (London, England), 10 April 1847, which noted a sighting report from 25 December in or close to Selat Gelasa.
37. The actual title is a wonderful example of nineteenth-century book titling: *The India Directory, Directions for sailing to and from the East Indies, China, Australia, and the Interjacent Ports of Africa and South America: Compiled chiefly from original journals of the Honourable Company's ships, and from observations and remarks, resulting from the experience of twenty-one years in the navigation of those seas* (London: W. H. Allen & Co., 1843). Kellett would have used the second volume of the fifth edition.
38. One extant example, which may or may not have been typical, are the Yale Maps removed from a Chinese trading junk taken as prize in 1841 by HMS *Herald*. The maps are a navigational guide to the sailing routes from Korea to the Gulf of Thailand, comprising written instructions for each leg accompanied by a series of some 120 coastal views, showing each main turning point or waypoint. See Stephen Davies, 'The Yale Maps and Western Hydrography: Influences and Contributions,' *Proceeding of the International Workshop on Maritime East Asia, 1433–1840; The Chinese Navigational Map at Yale University and Its Significance*, 16–18 June 2010, National Chiao-tung University, Hsinchu, Taiwan.
39. The traditional route most likely to have been taken by the *Keying* can be inferred from the Yale Maps.
40. *Account*, p. 9.
41. Nathaniel Bowditch, *The New American Practical Navigator*, 2nd ed. (New York: E. & M. Blunt, 1826), Ch. 24. This deals with the seven modern mathematical sailings, but before that, in the days of oral pilotage that characterized traditional Arab, Chinese and pre-fifteenth-century European navigation, what one might call vernacular sailings—lists of the courses and durations necessary to get from A to B to C—were common currency and taught by way of long, chanted lists. See, for example, the discussion in G. R. Tibbetts, *Arab Navigation in the Indian Ocean before the Coming of the Portuguese* (London: Oriental Translation Fund/Royal Asiatic Society, 1981), Pt. 3.
42. Stephen Davies and Elaine Morgan, *Cruising Guide to Southeast Asia*, vol. 2 (St. Ives: Imray, Laurie, Norie & Wilson, 1999), p. 177.
43. *Ibid.*, p. 25. One notes also in the *Indonesia Pilot*, vol. 2 (Taunton: Hydrographer of the Navy, 1975), para. 2.3, p. 22: 'WSW winds in December, W winds in January, and WNW winds in February . . .' which further mentions the possibilities of rough seas if the wind is brisk and, in para 2.4, the existence from October to March of an adverse northeast-to-north current of 0.75 knots. *Ocean Passages for the World*, 4th ed. (Taunton: Hydrographer of the Navy, 1987), makes the point that traversing the Sunda Strait in this season is a tough beat to weather (para. 9. 49. 9, pp. 218–9).
44. *Account*, p. 13.

45. C. Northcote Parkinson, *Trade in the Eastern Seas, 1793–1813* (Cambridge: Cambridge University Press, 1937), Ch. 7. Parkinson implies that the average Indiaman on the return trip of a China run had around fifteen to twenty Chinese crewmen.
46. *Account*, p. 8.
47. The Hong Kong Maritime Museum possesses the copy log of the fourth mate.
48. See Davies and Morgan, *Cruising Guide to Southeast Asia*, pp. 45–6.
49. See H. Whittingham and C. T. King, *Reed's Table of Distances between Ports and Places in All Parts of the World*, 11th ed. (Sunderland: Thomas Reed, 1929), p. 87.
50. *Ibid.*, p. 177.
51. *Description*, p. 8.
52. See the relevant pilot chart for the Indian Ocean in March at http://www.nga.mil/MSISiteContent/StaticFiles/NAV_PUBS/APC/Pub109/109mar.pdf; accessed on 10 February 2013, which shows an average of force 4 winds east or southeast for 50–60 percent of the time. The same chart shows that very light and variable winds with 8 percent calms would have been likely from the exit of the Sunda Strait to the established trades, which were some 480 miles away, or ten days at 2 knots.
53. *Glasgow Herald*, 16 July 1847.
54. *Description*, p. 8.
55. Adrian Hayter, *Sheila in the Wind* (London: Hodder & Stoughton, 1959).
56. See <http://www.rawlins.org/mormontrail/rbodily.html> for the history of the Bodily family, which arrived in Cape Town in 1846. See also Nigel Worden, Elizabeth van Heyningen and Vivian Bickford-Smith, *Cape Town: The Making of a City* (Cape Town: David Philip, 1998), pp. 164–5, which notes that in 1839, 532 ships called—ten a week, not allowing for seasonal variations—and more were calling each year, to reach 600 by 1860. Thirty percent of these were replenishment calls by ships carrying emigrants and Indian and Chinese indentured labour, or coolies.
57. See Melanie Yap, Dianne Leong Man, *Colour, Confusion and Concessions: The History of the Chinese in South Africa* (Hong Kong: Hong Kong University Press, 1996), Ch. 1. Yap and Leong Man give no precise figures, but by inference the Chinese community in 1847 was probably two or three dozen.
58. Fifteen years later, tea clippers were making runs from China to London in record times of around 90 days, 88 days being the quickest. Most clippers averaged 100 to 110 days for the trip. The distance was around 15,000 miles, so the fastest clippers were averaging 7 knots and the middling performers a bit under 6.
59. *Description*, p. 8.
60. See <http://www.mastergardenproducts.com/tungoil.htm> for the properties of the oil. For the reference to the skin complaint, see C. H. S. Tupholme, 'Dermatitis from Tung Oil', *British Journal of Dermatology* 51, no. 3 (1939): 138–40, and more generally <http://bodd.cf.ac.uk/BotDermFolder/BotDermE/EUPH-16.html>. For the properties of lime, see Mel M. Schwartz, *Encyclopedia of Materials, Parts and Finishes*, 2nd ed. (Boca Raton, FL: CRC Press, 2002), at <http://books.google.com/books?id=aUJ5fVAVPfAC&pg=PA84&lpg=PA84&dq=is+lime+from+crushed+shells+>

poisonous&source=web&ots=V3r3i93aPs&sig=QK0dJh_JgVE7kIShD4b3rDqEie
s&hl=en&sa=X&oi=book_result&resnum=3&ct=result; both sites accessed on 6
December 2011.

61. Whether covering the bottom of ships with copper to protect them is yet another Chinese technological first, leaving the late eighteenth-century European examples as johnny-come-latelies will probably never be decided. The evidence for Chinese precedence in the fourth century given by Needham (Joseph Needham et al. *Science and Civilization in China*, vol. 4: *Physics and Physical Technology* [Cambridge: Cambridge University Press: 1971], pp. 665 and 697) is at best extremely equivocal; if such was the case, it does not seem to have resulted in an established practice. The *Keying* was certainly not so protected.
62. See Kuno Knöbl, *Tai Ki: To the Point of No Return* (Boston: Little Brown, 1976), pp. 202–4, for the description of the discovery of the problem and the traditional use of tung oil. Much the same point is made in G. R. G. Worcester, *Junks and Sampans of the Yangtze* (Annapolis, MD: Naval Institute Press, 1971), p. 36, though he is careful to add that this is a practice of river (fresh and brackish water) craft, not sea-going junks.
63. See Needham, *Science and Civilization in China*, vol. 4: *Physics and Physical Technology*. Western ships generally had a third line of protection beneath the fail-safe—a backing of tar and horsehair onto which the outer layer of planking was nailed (for a description of a recovered wreck that was so constructed, see J. Richard Steffy, *Wooden Shipbuilding and the Interpretation of Shipwrecks* [College Station: Texas A&M University Press, 1994], p. 156, where he discusses the wreck of the British-built HMS *Dartmouth*, which was built in 1655 and sank in 1690).
64. In his fascinating study of traditional Arab craft, Clifford Hawkins well describes the regular cleaning of the ship's bottom and refreshing the *chunam* (in Swahili, *shahamu*). There is no question of antifouling. See Clifford Hawkins, *The Dhow: An Illustrated History of the Dhow and Its World* (Lymington: Nautical Publishing, 1977), p. 87, and especially the illustrations on pp. 34 and 56.
65. See C. R. Southwell and J. D. Bultman, 'Marine Borer Resistance of Untreated Woods over Long Periods of Immersion in Tropical Waters', *Biotropica* 3, no. 1 (June 1971): 81–107. This and many other sources make the point that the resistance of teak to marine borers is far less than popular anecdote would suggest, and that no reliance should be placed on a teak-built hull as itself able to resist attack without adequate protection. See also J. R. McNeill, 'Woods and Warfare in World History', *Environmental History* 9, no. 3 (2004), where the superiority of the resistance of Cuban cedar is mentioned at <http://www.historycooperative.org/journals/eh/9.3/mcneill.html>; accessed on 3 March 2011.
66. When the author left on a 50,000-mile odyssey at sea in a small yacht, his partner, who wore contact lenses, was advised by a biochemist friend that once well offshore, seawater was sufficiently devoid of organic life to work, untreated, as a perfectly healthy saline solution! She took the advice and never suffered any adverse consequences.

67. Load lines for ships—their ‘marks’—date from the British Merchant Shipping Act of 1876, which created the famous Plimsoll Line after the name of the member of parliament who had fought hard for the law. Interestingly, the actual position of the line on the hull was not fixed by law until almost twenty years later in 1894; see http://www.imo.org/TCD/mainframe.asp?topic_id=1034.
68. A wave is an undulation in the water surface occasioned by winds locally and experienced locally. A swell, by contrast, is defined as an undulation in the water surface caused either by winds that are no longer blowing or by winds remote from where the swell is being felt.
69. *Description*, p. 8.
70. See Lawrence V. Mott, *The Development of the Rudder: A Technological Tale* (London: Chatham Publishing / College Station: Texas A&M University Press, 1997), p. 121, for evidence of what may have been a centerline rudder in ancient Egypt.
71. See Mott, *Development of the Rudder*, Ch. 7 and *passim*.
72. *Description*, p. 17.
73. *Description*, p. 16, and also *The Belfast News-Letter*, 26 May 1848.
74. It is often claimed that it took the best part of 800 years for the West to catch up, the first balanced sternpost rudders not appearing until HMS *Bellerophon* in 1865. As Mott (*Development of the Rudder*, Ch. 3) points out, Greek and Roman quarter-oars used both balanced and semi-balanced designs.
75. See Dave Gerr, *Boat Mechanical Systems Handbook: How to Design, Install, and Recognize Proper Systems in Boats* (Camden, ME: International Marine/Ragged Mountain Press, 2008), p. 200.
76. *The Belfast News-Letter*, 26 May 1848; *Description*, p. 17.
77. An excellent discussion of all of these issues, with a full technical analysis, can be found in C. A. Marchaj, *Seaworthiness: The Forgotten Factor* (London: Adlard Coles, 1986), especially Chs. 8 and 10.
78. This is particularly true in the tropics when, on moonless nights, a strong squall can overtake one in the darkness with frightening suddenness. With too much sail up, all hell breaks loose. Indiamen were notorious for the conservative way in which they were sailed, reputed always to reduce canvas at night, although Jean Sutton quite rightly argues that this was no iron-fast rule, many an Indiaman's captain being quite prepared to press on if there was money to be made from a swift passage; see Jean Sutton, *Lords of the East* (London: Conway Maritime, 1981), pp. 94–5.
79. This is obviously conjecture, but a review of the list of ships calling in the port of Hong Kong between August 1841 and January 1843, compiled by M. Forth-Rouen, the French consul in Canton, from the harbour-master's reports and appearing in his letter book, now in the Ministry of Foreign Affairs archives in Paris, reveals some 80 percent were carrying opium; see Stephen Davies, *French Ships, Friendship* (Hong Kong: Hong Kong Maritime Museum, 2008), p. 35. This remained the main cargo until the restrictions on interport trade in China imposed by the 1843 Treaty of the Bogue were lifted, following the Second Opium War in 1856–60. One does not know who Charles Kellett sailed with before he became a partner in the *Keying*

- project and the ship's captain, but his career is highly unlikely not to have involved the carriage of opium. Frank Walsh quotes *The Economist* of 8 March 1851, noting, 'The island (Hong Kong) is a kind of bonded ware house . . . for the opium trade', in the context of a larger comment on the absence of any significant growth in trade in Hong Kong's first decade of existence; Frank Walsh, *A History of Hong Kong*, revised ed. (London: HarperCollins, 1997), p. 197.
80. The Howland and Aspinwall-owned, John Willis Griffiths-designed *Rainbow*, the first 'extreme clipper', had been built by Smith and Dimon of New York and launched in 1845. See D. R. MacGregor, *Fast Sailing Ships: Their Design and Construction, 1775–1875*, 2nd ed. (London: Conway Maritime Press, 1988), p. 124.
 81. The basic text is John H. Harland's brilliant *Seamanship in the Age of Sail: An Account of Shiphandling of the Sailing Man-of-War, 1600–1860* (London: Brassey, 1982); for how close to the wind a square-rigger could sail, see pp. 62–6.
 82. See Stephen Davies, *Coasting Past: The Last South China Coastal Trading Junks Photographed by William Heering* (Hong Kong: Hong Kong Maritime Museum, 2013), pp. 35–64.
 83. Walsh, *A History of Hong Kong*, pp. 595–9.
 84. This says that the direction of the apparent wind acting on a sail twists away from the direction of the wind at sea level progressively with height, as the true wind speed increases with the decrease in surface friction. It follows that a sail must twist away to leeward progressively from deck to masthead level, in order to have the same angle of incidence and thus work as an aerofoil.
 85. G. R. G. Worcester, *Sail and Sweep in China: The History and Development of the Chinese Junk as Illustrated by the Collection of Models in the Science Museum* (London: HMSO, 1966), p. 20.
 86. Worcester, *Junks and Sampans of the Yangtze*, p. 86.
 87. See C. A. Marchaj, *The Aero-hydrodynamics of Sailing*, 3rd revised ed. (London: Adlard Coles Nautical, 2000).
 88. *Account*, p. 4: '[The Keying] possesses the combined qualities of a Trader and a vessel of War.'
 89. Captain Nelson Liu, personal communication.
 90. This is a rather interesting figure. 'A census in 1851 showed a total of 6,914 inhabitants living on the island' (http://en.wikipedia.org/wiki/Saint_Helena).
 91. Yap and Man Leung (*Colour, Confusion and Concessions*, p. 13) indicate that, by around 1830, there may have been up to 200 Chinese residents. As of 1834, with St. Helena becoming a British colony as opposed to an East India Company possession, it became official policy to send the Chinese residents to Cape Town. By 1847, only a handful appears to have been left. The last Chinese resident died in 1875.
 92. The letter was reprinted in the *Caledonian Mercury*, 17 February 1848. The *Penelope* was originally a sailing frigate launched in 1829. She was converted to a paddler at Chatham in 1832, by lengthening with a 63' 4" new mid-section; Lyon & Winfield, *op. cit.*, pp. 152–3. At this date, the *Penelope* was commanded by Captain Henry

- Wells Giffard, RN, and was nominally the flagship of Commodore Charles Hotham, commander-in-chief of the west coast of Africa.
93. British and American maritime law were not at this point greatly different, so what can be found in George Ticknor Curtis, *A Treatise on the Rights and Duties of Merchant Seamen according to the General Maritime Law and the Statutes of the United States* (Boston: Little and Brown, 1841), is germane and informs what follows above.
 94. *Ibid.*, Ch. 2, p. 11.
 95. *Ibid.*, p. 12.
 96. *Ibid.*, pp. 24–5.
 97. *Caledonian Mercury*, 17 February 1848.
 98. *Description*, p. 7. A composite chart from the United Kingdom Hydrographic Office Archive, created by an enthusiast to show the gripping Great Tea Race of 1865, when five crack clippers raced to be the first to London from Foochow, shows all five ships crossing the line in around 22°W, though this was in August, not May. A copy of the chart is part of the HKMM collection. *Ocean Passages for the World* (p. 191) recommends crossing the Line in 25°W to 30°W.
 99. Letter from Kellett to Queen Victoria, Boston, 14.1.1848 in *Caledonian Mercury*, Edinburgh, 17.2.1848.
 100. That means, for example, pulling a halyard in a bit or easing it out to change the location of chafe points and reduce topical wear. This distributes wear and tear, extends the life of cordage and mitigates the chaos and danger of ropes parting.
 101. In the British system, these more competent sailors were known as ‘able seamen’, whose experience had shown them able to ‘hand, reef and steer’—that is, handle at deck level the ropes vital for swiftly and safely trimming, furling or reefing sails, to go aloft and reef or shake the reefs out of sails, and to steer the ship. Other seamen were boys (in effect, apprentices, though in the British merchant marine only future officers did a formal apprenticeship) or ordinary seamen, who did routine maintenance, kept a lookout and performed other tasks, including going aloft, under supervision. See Peter Kemp, *The Oxford Companion to Ships and the Sea* (Oxford: Oxford University Press, 1976), pp. 1, 373, 695–6 and 831.
 102. Strictly, into seven four-hour periods and two two-hour periods known as the ‘dog watches’, from 1600–1800 and 1800–2000, which were intended to avoid the monotony of always standing the same watch, and had been in use since the seventeenth century. It is not clear how far the more elaborate system was used aboard run-of-the-mill small vessels like the *Keying*.
 103. See Derek Lundy, *The Way of a Ship: A Square-rigger Voyage in the Last Days of Sail* (London: Ecco Press, 2004). The basic text on crew work is Harland, *Seamanship in the Age of Sail*.
 104. I am indebted to Endymion Wilkinson’s *Chinese History: A Manual*, revised and enlarged edition (Cambridge, MA: Harvard University Asia Center, 2000), Ch. 6, pp. 198–219. He was a sure guide through the labyrinth.

105. *Glasgow Herald*, 9 August 1847. A ‘sectional dock’ is a form of floating dock; by 1847, New York had several. Two are specifically mentioned in H. Johnson and F. S. Lightfoot, *Maritime New York in Nineteenth-Century Photographs* (New York: Dover Publications, 1980), p. 80, one south of Pier 41 and the other at Pike Street. J. H. Morrison (*History of the New York Shipyards*, New York: Wm. F. Sametz, 1909, p. 61) notes, ‘The New York Sectional Dock Company had built a sectional dock from the plans of Phineas Burgess and Daniel Dodge in 1839 . . . This dock was located in the vicinity of the other floating docks on the East River.’
106. *Description*, p. 19.
107. *Account*, p. 10.
108. Some of the newspaper reports of the junk’s arrival in New York attributed its arrival there to navigational error (see *Glasgow Herald*, 9 August 1847; *Preston Guardian*, 14 August 1847). There is no clue why this conclusion should have been jumped to, so astonishing an error being impossible unless the navigator was not so much inexperienced as completely ignorant; nothing in the ship’s voyage thus far suggests anything but solid competence on Captain Kellett’s part.
109. *The Morning Chronicle*, 23 July 1847; *Caledonian Mercury*, 26 July 1847; *The Aberdeen Journal*, 28 July 1847. H. H. Brindley (‘The Keying’, *The Mariner’s Mirror* 8, no. 4 [1922]: 305–14) summarizes some of these reports. The *Hampshire Telegraph and Sussex Chronicle etc.*, 24 July 1847, has a vague report of the *Keying* near Bermuda and a speculation that she may have harboured there—a telling example of the extreme uncertainties as to the whereabouts of shipping in the mid-nineteenth century.
110. Charles Wheeler, ‘A Monk’s Tale: A Chinese Memoir of a Sea Passage to Vietnam in the Seventeenth Century’, unpublished, p. 44, made available by Dr. Wheeler and quoted with his permission.
111. *Ibid.*, p. 191.
112. See http://www.nga.mil/MSISiteContent/StaticFiles/NAV_PUBS/APC/Pub106/106jun.pdf for the June North Atlantic pilot chart showing this.
113. Admiral Smyth tersely defines this as a wind ‘which serves either way; allowing a passage to be made without much nautical ability’. Admiral W. H. Smyth, *The Sailor’s Word-book: An alphabetical digest of nautical terms, including some more especially military and scientific, but useful to seamen; as well as archaisms of early voyagers, etc.* (London: Blackie and Son, 1867).
114. What are called sailing directions, which had been published to cover more of the world’s waters in ever-increasing detail since the first examples in the fifteenth century, the practice accelerating rapidly from the end of the eighteenth century on.
115. *Description*, p. 8, and Kellett’s letter to Queen Victoria, ‘To Her Most Excellent Majesty the Queen’, reprinted in *Caledonian Mercury*, 17 February 1848 (but dated by Kellett 14 January 1848, Boston). The definition of this mishap is: ‘SPRING, a crack or breach running transversely or obliquely through any part of a mast or yard, so as to render it unsafe to carry the usual quantity of sail thereon’; William Falconer, *An Universal Dictionary of the Marine* (London: Cadell, 1780).
116. *Ocean Passages for the World*, p. 192.

117. Details from Kellett's letter 'To Her Most Excellent Majesty the Queen'.
118. This is about the longest passage faced by any junk on the traditional seaways of the trades from China; it would have been from a port on the southern part of the west coast of India—Calicut or Cochin—to one of the ports on the south coast of the Yemen (about 1,700 nautical miles) or directly across the Arabian Sea to somewhere in modern Kenya (about 2,000 nautical miles) that we know from the record were seldom followed by Chinese vessels after the early fifteenth century. Most routes were a great deal shorter, being under 1,000 nautical miles and, even at the *Keying's* speed, likely to involve less than two weeks at sea.
119. Kenneth J. Carpenter, *The History of Scurvy and Vitamin C* (Cambridge: Cambridge University Press, 1986).
120. M. Torck, 'The Issue of Food Provision and Scurvy in East and West: A Comparative Enquiry into Medieval Knowledge of Provisioning, Medicine and Seafaring History', in *East Asian Maritime History I: Trade and Transfer across the East Asian "Mediterranean"*, edited by A. Schottenhammer et al. (Wiesbaden: Harassowitz Verlag, 2005), pp. 275–88. That Chinese mariners may in fact have been more disposed to the dangers of scurvy genetically is the conclusion of J. R. Delanghe, M. R. Langlois, M. L. de Buyzhere and M. A. Torck, 'Vitamin C Deficiency and Scurvy Are Not Only a Dietary Problem but Are Codetermined by the Haptoglobin Polymorphism', *Clinical Chemistry* 53, no. 8 (2007): 1397–1400.

Chapter 4 The Troubled Stay in New York

1. Erving Goffman, *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates* (Garden City, NY: Anchor Books, 1961) is the *locus classicus*, especially 'On the characteristics of total institutions' (pp. 3–124), including ships specifically on page 45. In the introduction, Goffman describes the 'total institution' as 'a place of residence and work, where a large number of like-situated individuals, cut off from the wider society for an appreciable period of time, together lead an enclosed, formally administered round of life'.
2. The original forms the opening sentence of *Anna Karenina*.
3. The first lightship had been stationed off Sandy Hook in 1823 but removed in 1829 because of the construction of the Navesink Twin Lights. In 1838, a new lightship was placed on station, still apparently called Sandy Hook, the name 'Ambrose lightship' not being used until a new lightship further north at the entrance to the Ambrose Channel was installed in 1852. It follows that, when the *Keying* arrived in New York, the navigational aids available to guide her in had yet to be perfected; see George R. Putnam, *Lighthouses and Lightships of the United States* (New York: Houghton-Mifflin, 1917).
4. One has to wonder whether a thoughtful American skipper was conscious of the different attitudes of the antebellum South and considered Charleston likely to be a less welcoming port of call to a largely Chinese-crewed junk than more cosmopolitan New York.

5. See <http://www.nps.gov/history/NR/twhp/wwwlps/lessons/131lighthouse/131facts1.htm>.
6. See <http://njscuba.net/sites/index.html>. The site has many detailed charts showing the density of wrecks. These are even more striking when one realizes that, for every wreck charted, there are possibly fifteen or twenty more that are not charted or have not yet been identified.
7. See <http://www.uscg.mil/history/articles/CGNorthAtlantic.pdf>. The historical service of the US Coastguard is exemplary.
8. Edmund M. Blunt, *The American Coast Pilot: containing directions for the principal harbors, capes and headlands, of the coasts of North and South America: describing the soundings, bearing or the lighthouses and beacons from the rocks, shoals and ledges, &c. with the prevailing winds, setting of the currents, &c and the latitudes and longitudes of the principal harbors and capes, together with a tide table*, 14th ed. (New York: Edward and George Blunt, 1842). Sailors are wont to be superstitious, so there was no thirteenth edition.
9. Delightfully, Blunt calls it Neversink.
10. Blunt, *The American Coast Pilot*, p. 213.
11. See <http://www.uscg.mil/history/weblighouses/LHNJ.asp>. The light was improved in 1857.
12. Edward L. Allen (ed.), *Pilot Lore: From Sail to Steam and Historical Sketches of the Various Interests Identified with the Development of the World's Greatest Port* (New York: National Service Bureau, Sandy Hook Pilots Benevolent Association, 1922). The book begins with a list of the fifty-one pilots who lost their lives on service, 1852–1922.
13. *Ibid.*, p. 6.
14. *Ibid.*, p. 9.
15. John Kuo Wei Tchen, *New York before Chinatown: Orientalism and the Shaping of American Culture, 1776–1882* (Baltimore: Johns Hopkins University Press, 2001), p. 63.
16. *The Illustrated London News*, 1 April 1848, p. 222.
17. See the Museum of the City of New York's website for a photographic reproduction.
18. One of P. T. Barnum's good friends was Nathaniel Currier, the maker of what is probably the most realistic print of the *Keying*; see www.oldprintshop.com/artists/currier-ives-nat.htm. If there is any truth to the claim that Barnum had a replica junk created in order to offer one of his raree shows, then Currier's careful draftsmanship may have served the role of a useful database.
19. Kellett's letter to Queen Victoria.
20. John Rogers Haddad, *The Romance of China: Excursions to China in U.S. Culture, 1776–1876* (New York: Columbia University Press, 2008).
21. The Economic History website (<http://eh.net/hmit/>) offers five different comparators. On the most indicative of these, if the claimed visitor numbers are correct, the showing made around US\$700 million in today's dollars. Equally, given that the population of New York City in 1847 was between 371,223 and 515,547 (Ira

- Rosenwaikē, *Population History of New York City*, Syracuse NY: Syracuse University Press, 1972, p. 36, Table 6), to suppose 480,000 people visited the *Keying* over four months is to suppose nearly 100 percent of the city's inhabitants were rowed out to the anchored vessel. Both analyses suggest the visitor figures were exaggerated.
22. Samuel Wells Williams (1812–84) had a long relationship with China, with Western inroads there and in his early days—he first arrived in Canton in 1833—with mission activity. In 1845–47, he was back in the United States, during which time he married Sarah Walworth and played a leading role in the *Keying* affair. The following year, he returned to Hong Kong and became the editor of the then leading news source, *The Chinese Repository*. He was closely involved in attempts to open up trade with Japan, beginning with a trip on the ship *Morrison* in 1837. In 1853, two years after he left the editorship of *The Chinese Repository*, he became Commodore Perry's official interpreter. In 1855, he became the secretary of the American Legation in China, playing a key role in negotiating the 'unequal' Treaty of Tientsin, then spending fifteen years as America's chargé d'affaires in Beijing. Following his resignation in 1875, in 1877 he became the first professor of Chinese language and Chinese literature at Yale University.
 23. Numbers from Tchen, *New York before Chinatown*, p. 64.
 24. Haddad, *The Romance of China*.
 25. *Caledonian Mercury*, 21 October 1847.
 26. Haddad, *The Romance of China*, citing *New York Herald* (4 August 1847).
 27. W. Daniel Lord (1794–1868), a graduate of Yale, was admitted to the New York bar in 1817 and established the firm of Lord, Day and Lord with his son Daniel de Forest Lord and his son-in-law Henry Day in 1845; *Obituary Record of Graduates of Yale College Deceased during the Academical Year Ending in July, 1868 including the record of a few who died a short time previous, hitherto unreported* (New Haven: Yale College Alumni, 1868), p. 267. On 26 September 1849, Richard Henry Dana called on W. Daniel Lord in New York, which, given Dana's championing of seamen's rights, suggests that Lord was broadly of the same views and explains the eagerness with which he took up the *Keying* case.
 28. There is a single document, called the Ship's Articles, which is a pre-printed form with blanks for the captain to fill in as indicated in the text.
 29. Michael C. Lazich, 'American Missionaries and the Opium Trade in Nineteenth-century China', *Journal of World History* 17, no. 2 (2006): 52. <http://www.historycooperative.org/cgi-bin/justtp.chi?act=justtop&url=http://historycooperative.org/journals/jwh/17.2/lazich.html>; accessed on 26 June 2012. See also Haddad, *The Romance of China*, Ch. 6.
 30. 'There were plenty of Anglophobic American officials and traders in China . . .'; Robert Bickers, *The Scramble for China: Foreign Devils in the Qing Empire, 1832–1914* (London: Penguin Books, 2011), p. 173, citing Eldon Griffin, *Clippers and Consuls: American Consular and Commercial Relations with Eastern Asia, 1845–1860* (Ann Arbor: Edwards Bros., 1939), pp. 180–2. Haddad, *The Romance of China*, Ch. 6, which is *inter alia* an essay on Williams, can be read as showing that Williams had

no admiration for the British other than as contingent agents of essential change to China.

31. Tchen, *New York before Chinatown*, p. 67.
32. *Ibid.*, pp. 67–8.
33. The crew were fortunate in having Samuel Wells Williams as their interpreter. He saw in Kellett a duplicitous and brutal captain, as he noted in his letters to his fiancé Sarah Walworth; Haddad, *The Romance of China*, Ch. 6.
34. Richard Henry Dana, *The Seaman's Friend* (New York: Scribner, 1841).
35. Library of Congress, <http://memory.loc.gov/cgi-bin/ampage?collId=llsb&file Name=026/llsb026.db&recNum=1563>; accessed on 13 May 2009.
36. Samuel Wells Williams, *The Middle Kingdom: A Survey of the Geography, Government, Education, Social Life, Arts, Religion &c. of the Chinese Empire and Its Inhabitants, with a new map of the Empire* (New York: Wiley & Putnam, 1848), vol. 1, pp. 544–5, author's emphasis.
37. *Hampshire Telegraph and Sussex Chronicle*, 16 October 1847; *The Era* (London), 17 October 1847; *The Globe*, 8 July 1847.
38. See <http://library.mysticseaport.org/initiative/PageImage.cfm?PageNum=2&Bib ID=28969>, accessed on 22 April 2013. Letters in italics written in manuscript, the rest printed.
39. Erastus C. Benedict, *The American Admiralty Law: Its Jurisdictions and Practice with Practical Forms and Directions* (New York: Banks, Gould & Co., 1850), seventh pleading. One crewman was paid US\$11 a month, two US\$9, eleven US\$8, and thirteen US\$6. This actually works out at US\$7.50 each a month on average.
40. The US dollar to pound sterling exchange rate in 1848 was US\$4.87 = £1; a steerage passage from Melbourne to New York was about £38, so a fare from New York to Hong Kong/Canton would have cost between US\$110 and US\$200, at the lower end if a practice like the later 'Asiatic steerage' applied.
41. *American Lloyd's Register of American and Foreign Shipping*, 1864, has a two-deck bark, *Candace*, 398 tons, 117' long, 27' beam, built in 1845 in Warren, RI, master A. Schau, home ported in Altona, Hamburg and owned by J. C. D. Dreyer, a company involved in the West Indies trade 1800–1850. Early Lloyd's lists, British or American, are not always reliable as to details of ownership, since the transmission of intelligence before the electric telegraph was patchy. Haddad cites 'Sailing of the Chinese Sailors, belonging to the Cochin China Junk', *The American Magazine*, 13 November 1847, for the details. That the article refers to a Cochinchina junk (i.e., a junk from Vietnam) is a curious detail, adding further mystery to the *Keying's* provenance.
42. *New York Tribune*, 8 September 1847, Law Courts, United States District Court, The Chinese Junk.
43. *Journal of the House of Representatives*, 22 December 1848, p. 144. <http://memory/loc.gov/ammem/amlaw/lwcr.html> and <http://www.gpo.gov/fdays/browse/collection.action?collectionCode=CREC>.

44. *Journal of the Senate*, 26 December 1848, pp. 83–4 and 91 from the same electronic source.
45. *Ibid.*, 30th Congress, 4th Session, H.R. 368 [Report No. 416], 28 March 1848.
46. For what follows, I am severally indebted to Mark Elvin (ed.), *Transport in Transition: The Evolution of Traditional Shipping in China*, translated by Andrew Watson (Ann Arbor: Centre for Chinese Studies, University of Michigan, 1972); Hans van Tilburg, *Chinese Junks on the Pacific: Views from a Different Deck* (Gainesville: University Press of Florida, 2007); and K. F. Gützlaff, *Journal of Three Voyages along the Coast of China in 1831, 1832, and 1833* (New York: J. P. Haven, 1833), p. 95, and Jennifer Cushman, *Fields from the Sea, Chinese Junk Trade with Siam during the Late Eighteenth and Early Nineteenth Centuries* (Ithaca, NY: Cornell University SEAP, 1993), especially Ch. 3.
47. Roughly the first four were officers: owner-cum-administrative captain-cum-supercargo, sailing master-cum-navigator-cum-mate, purser-cum-mate-cum-captain's secretary, loadmaster-cum-bosun, cox'n-cum-quartermaster; the second group were petty officers: first and second anchor boss, chief mainsail haul, Nos. 1, 2 and 3 halyard easers, ship's husband-cum-carpenter, the armourer-cum-blacksmith, the ship's chaplain-cum-chronometer tankie, as it were, and then came the customarily and, it seems, ubiquitously lumpen world of the deckhand. These roles—by no means common to every Chinese ship, though fairly normal to oceangoing ships in the *nanyang* trades—can be found well differentiated, though as we shall note without any clear grasp of how they worked together, in Cushman, *Fields from the Sea*, pp. 100–5, and, particularly for northern China, in the essays by Japanese researchers of the 1930s and 1940s in Elvin (ed.), *Transport in Transition*.
48. It is usually translated as 'helmsman', but this fails to grasp the larger sense of the role unless we recall Mao Zedong's sobriquet of Great Helmsman.
49. Wells Williams, *The Middle Kingdom*, vol. 2, Ch. 8.
50. Tchen, *New York before Chinatown*, p. 70.
51. It is interesting to note in this regard that in George Ticknor Curtis, *A Treatise on the Rights and Duties of Merchant Seamen according to the General Maritime Law and the Statutes of the United States* (Boston: Little and Brown, 1841), p. 13, any such arrangements in European law would have rendered the seamen partners in the entire voyage. While this appears not have been at all uncommon in medieval European maritime trade, by the nineteenth century, bar perhaps in coastal shipping, it was evidently very unusual; only in some European civil law jurisdictions did it confer on the seamen the full and normal rights of a partner.
52. Wells Williams's outrage is extremely well conveyed in Haddad, *The Romance of China*, Ch. 6.

Chapter 5 The Final Leg—Towards Journey's End

1. Edmund M. Blunt, *The American Coast Pilot*, 14th ed. (New York: Edward and George Blunt, 1842), pp. 166–207.

2. The useful shortcut of the Cape Cod Canal would not be possible until 1914, when the New York financier August Belmont had the first, narrow and shallow channel dug.
3. See K. C. Liu, *Anglo-American Steamship Rivalry in China, 1862–1874* (Taipei: Rainbow Bridge Book Co., 1962) and the excellent *Steamboats on the Hudson: An American Saga*, hosted by the New York State Libraries at <http://www.nysl.nysed.gov/mssc/steamboats/toc.htm>.
4. For an excellent evocation of the world of the 1840s New York waterfront, see Melvin Maddocks, *The Atlantic Crossing* (Alexandria, VA: Time-Life Books, 1981), Ch. 3 and Barbara La Rocco (ed.), *A Maritime History of New York* (New York: Going Coastal, 2004) in general, but especially Ch. 8.
5. John Rogers Haddad, *The Romance of China: Excursions to China in U.S. Culture, 1776–1876* (New York: Columbia University Press, 2008), Ch. 5, noting the comparative isolation of Afong Moy, New York's first resident Chinese woman. Jack Chen (*The Chinese of America*, New York: Harper Row, 1980, p. 5) mentions no significant Chinese presence in New York by 1847; the statistics in Susan B. Carter, 'Embracing Isolation: Chinese American Migration to Small-Town America, 1882–1943', draft paper proposed for the 36th Annual Meeting of the Population Association of America, San Francisco, CA, 3–5 May 2012 (<http://paa2012.princeton.edu/papers/121668>; accessed on 11 March 2013), esp. Table 3, shows that for all of the United States by 1850 there were but 671 Chinese males of average age 24.
6. Yung Wing, *My Life in China and America* (New York: Henry Holt & Co., 1909), pp. 21–4.
7. Arnold J. Meagher, *The Coolie Trade: The Traffic in Chinese Laborers to Latin America* (New York: XLibris, 2008).
8. At this stage in history, weather was very ill understood and data scarce. Matthew Fontaine Maury's path-breaking work compiling digests of ships' logs, which would result in the first pilot charts summarizing average wind and currents, had only just begun. In Blunt, *The American Coast Pilot*, for example, there is nothing helpful at all offered about average seasonal weather on the US coast. For the data given here, see http://www.ndbc.noaa.gov/station_history.php?station=44039.
9. Almost certainly Thomas Lamb (1796–1887): as a Boston shipping merchant, he was active in the China trade, he was also president of the Washington Marine and Fire Insurance Co. (1832–57), president of the Suffolk Savings Bank for Seamen (1844–85), treasurer of the Boston Marine Society (1830–84), president of the New England National Bank (1846–84), member of the Boston City Council under Mayor Josiah Quincy, president of the Boston Pier and Long Wharf Corp. (1851–85) and treasurer of the Boston Sugar Refinery. Married in 1828 Hannah Dawes Eliot. Their children were: Emily Goddard (b. 1829), Margaret Eliot (b. 1831), Thomas (1834–38), Hannah Eliot (1836–38), William Eliot (b. 1839), Charles Duncan (1841–71), Rosanna (b. 1843), Caroline (1845–49), and Horatio Appleton (1850–1926); see the Massachusetts Historical Society website at <http://www.masshist.org/>.

10. Edward H. Savage, *Boston Events: A brief mention and the date of more than 5,000 events that transpired in Boston from 1630 to 1880 . . .* (Boston: Tolman & White, 1884), p. 25; and *Police Record and Recollections, or Boston by daylight and gaslight for two hundred and forty years* (Boston: John P. Dale, 1873), p. 86.
11. Robert Bennet Forbes, *Personal Reminiscences*, 2nd ed. (Cambridge, MA: University Press, John Wilson & Son, 1882), chs. 9 and 10.
12. *Guide to the Collection, Robert Bennet Forbes Papers 1817–1889*, Massachusetts Historical Society, at <http://www.masshist.org/findingaids/doc.cfm?fa=fa0039#top>; accessed on 7 December 2011.
13. Forbes, *Personal Reminiscences*, Ch. 9 and Robert Bennet Forbes, *The Voyage of the Jamestown on Her Mission of Mercy* (Boston: Eastburn's Press, 1847).
14. Arthur Bonner, *Alas! What Brought Thee Hither?: The Chinese in New York 1800–1950* (Madison, NJ: Fairleigh Dickinson University Press, 1997), p. 3.
15. It was printed, *inter alia*, in the *Caledonian Mercury*, 17 February 1848.
16. In one of the more detailed newspaper accounts, the rudder is described as made of 'iron wood and teak, bound with iron, its weight is from seven and a-half to eight tons'; *The Belfast News-Letter*, 26 May 1848.
17. Sebastian Junger, *The Perfect Storm: A True Story of Men against the Sea* (New York: W. W. Norton, 1997) is a thrilling narrative. For the technicalities, see Wayne Sweet, Robert Fett, Jeffrey Kerling, Paul La Violette, 'Air-Sea Interaction Effects in the Lower Troposphere across the North Wall of the Gulf Stream', *Monthly Weather Review* 109, no. 5 (May 1981): 1042–52.
18. *Account*, p. 5.
19. H. H. Brindley, 'The Keying', *The Mariner's Mirror* 8, no. 4 (1922): 305–14, is the source for this story, which appears nowhere else and certainly not in the *Description* in any edition. Since Brindley cites as the source for some of his intelligence Kellett's son, Captain S. S. Kellett, it probably has the support of family lore and documentation that the younger Kellett, who served for many years in Calcutta (Kolkata), is reported as saying had long since perished.
20. *Lloyd's Weekly London Newspaper*, 21 May 1848.
21. Forbes, *Voyage of the Jamestown*, appendix, 17, Letter to Josiah Quincy, Esq., Chairman, pp. xi–xv. Forbes mentions that the ship tacked only once from the Boston Navy Yard to Old Head of Kinsale and that, making in on the final day, the *Jamestown* was doing 13 knots with the wind 4 points on the port quarter—what today's sailors would call a screaming reach!
22. Maddocks, *The Atlantic Crossing*, pp. 97, 98.
23. *Glasgow Herald*, 20 March 1848, which prints a letter dated 15 March from a James Franchard, Jersey, with this information. For a brief account of the stay, see <http://jouault.wordpress.com/2013/03/10/the-first-chinese-junk-to-visit-europe-in-march-1848/>.
24. Sources differ on the exact date. To compound the problem, *The Illustrated London News*' shipping page gives the arrival of the *Keying* at Gravesend as 1 April, see www.iln.org.uk/iln_years/ilnships1846_1848.htm.

25. *Description*, p. 8. All the references to the qualities of her build agree that it was very rough and ready.
26. Given the dates in Table 1; Kellett himself and the *Description* claim 212 days.
27. Wise, *An Analysis of One Hundred Voyages to and from India, China, &c.* (London: J. W. Norie & Co, 1839), also quoted in Jean Sutton, *Lords of the East* (London: Conway Maritime, 1981), p. 105.

Chapter 6 Journey's End: The London Stay

1. See <http://www.bl.uk/catalogues/evanion/Record.aspx?EvanID=024-000001375&ImageIndex=0>. The press mark is Evan.1570.
2. The only copy of this image that the author has been able to find is in the G.E. Morrison Collection in the Toyo Bunko in Japan, catalogue number E-3-9 at http://61.197.194.13/gazou/Honkon_dohanga-e.html, accessed on 23 April 2013.
3. See http://www.pla.co.uk/display_fixedpage.cfm/id/174.
4. From *The Jersey Times*, 5 April 1850, see <http://www.jerseysocietyinlondon.org/FNews/news.php?id=14>.
5. The young queen and Prince Albert, with princess royal, the prince of Wales and four courtiers visited the *Keying* on 16 May; court circular, *The Times*, 17 May 1848, No. 19865, p. 6. Charles Dickens visited some time in midsummer 1848, his piece in *The Examiner* being published on 24 June that year—in majoritarian fashion, he declared the *Keying* a ‘ridiculous abortion’.
6. *Daily News*, 13 June 1848.
7. The sum of £45,000 to £50,000, using standard conversions.
8. *Daily News*, 17 July 1851
9. See *Daily News*, 7 August 1851.
10. The Dunn exhibition had left London the year the *Keying* left Hong Kong, when it was sent around the British provinces.
11. See Susan Simmons’s information at <http://www.oulton.com/cwa/newsships.nsf/45cc5cb7c20526ef85256529004f20f0/38fbe91be88080918525719400052f25!OpenDocument>. In the same posting, Susan Simmons notes that Jane Kellett was the same age as Charles and still alive, and that they had a maid of all work called Charlotte Hall.
12. *Manchester Times*, 25 November 1848.
13. It is now in the Victoria and Albert Museum; see Henry Selous, ‘The Opening of the Great Exhibition’, 1851. Museum no. 329-1889. See also V. E. Graham, ‘The Mandarin Hsing and the Chinese junk the *Keying*’, *Arts of Asia* 30, no. 2 (2000): 96–102.
14. Guo Sungtao (1818–91) was a native of Hunan Province. He presented his credentials on 6 February 1877. In 1878, he was made concurrently the representative to France and chose to live in Paris. His tenure of both posts was short. He was relieved in late 1878 and died in 1891. A. W. Hummel (ed.), *Eminent Chinese of the Ch’ing*

- Period (1644–1912)* (Washington, DC: Library of Congress, 1943), pp. 438–9 and Kuo Sung-t'ao, Hsi-hung Liu and Te-i Chang, *The First Chinese Embassy to the West: The Journals of Kuo-Sung-T'ao, Liu Hsi-Hung and Chang Te-Yi*, trans. J. D. Frodsham (Oxford: Clarendon Press, 1974).
15. *Daily News*, 6 September 1851 and 2 October 1851.
 16. *Daily News*, 9 April 1849.
 17. See W. Johnson (ed.), *Shaky Ships: The Formal Richness of Chinese Shipbuilding*, exhibition catalogue, May–December 1993, National Maritime Museum Antwerp, p. 8, where the then mayor of Antwerp, H. B. Cools, comments on 'the *Keying* which, in 1848, under the command of the English captain Kellett was the first Chinese junk to call at our port on its way to London.' There is no evidence at all that the *Keying* paid its call on its way to London from Jersey, but there is certainly a window within which it might have, before finally leaving London for Liverpool.
 18. The year 1850 saw the last temperature minimum of what is known as the Little Ice Age in Europe; see http://en.wikipedia.org/wiki/Little_Ice_Age.

Chapter 7 The Endgame

1. Written on Tuesday 5 July 1853 and published in the *New-York Daily Tribune*, 20 July 1853, see <http://www.marxists.org/archive/marx/works/1853/07/20.htm>; accessed on 12 February 2013.
2. J. M. Compton, 'Open Competition and the Indian Civil Service, 1854–1876', *English Historical Review* 83, no. 327 (1968): 265–84.
3. The Hull newspaper copy mentions simultaneous notices in Birmingham, Liverpool, Manchester, Newcastle, Hull, Derby, Bristol, Plymouth, Exeter, Portsmouth, Brighton, Dover, Edinburgh, Glasgow, Dublin, Cork, Paris, Brussels, Le Havre, Calais, Boulogne, Dunkirk, Frankfurt and Amsterdam!
4. *The Era*, 6 June 1852.
5. *Belfast News-Letter*, 7 June 1952.
6. The use of the crossed pound sign (£) was not ubiquitous in nineteenth-century newspapers, not all of which bothered to acquire the additional piece of type, satisfying themselves with an uncrossed L.
7. *Caledonian Mercury*, 7 June 1853.
8. On the standard conversions, £8,900 in 1852 would be worth today between £708,301.77 and £963,548.94, which compares fairly well with the price given in chapter 1 of \$75,000; see http://www.measuringworth.com/calculators/exchange/result_exchange.php.
9. *University Hall 50th Anniversary* (Hong Kong: University Hall Alumni, 2007), excerpted at <http://www.uhall.com.hk/portal/aboutUHall/TheCastle.php>; accessed on 13 February 2013.
10. *Lloyd's Weekly Newspaper*, 27 March 1853.
11. From the *Liverpool Mercury*, 27 October 1854.

12. The St. George's Channel between North Wales and Ireland, a very rough stretch of water. The story reference is *Freeman's Journal and Daily Commercial Advertiser*, 14 May 1853.
13. See <http://www.humberpacketboats.co.uk/hull.html>; accessed on 13 February 2013.
14. For a graphic account of how a large, dead-towed vessel can girt and sink her tug, see <https://www.coastguard.net.nz/sartr/modules/Towing%20Techniques.pdf> (pp. 80–1); accessed on 13 February 2013.
15. *Manchester Times*, 18 May 1853.
16. Tony Edwards explicitly states that the ship did exhibit in Liverpool; see <http://www.danbyrnes.com.au/blackheath/reaction.htm>.
17. See http://en.wikipedia.org/wiki/Rock_Ferry.
18. This is an inference from a brief forum contribution by Tony Edwards (13 July 2005) to the South West Maritime History Society's web page (<http://www.swmaritime.org.uk/forums/thread.php?threadid=519>). Edwards wrote: 'Keying the "Royal Helsing" left the Mersey in October to visit other ports, returned to the Mersey (date unknown) where she was dismantled.'
19. See http://en.wikipedia.org/wiki/Junk_Keying. The coincidence of the phrase 'in three weeks' suggests that this is a misreport and that what is being recalled is the notice to that effect in the London papers in October 1851, noted on page 17 above.
20. *Liverpool Mercury*, 27 October 1854.
21. *Liverpool Mercury*, 10 November 1854.
22. *Liverpool Mercury*, 9 March 1855.
23. *Glasgow Herald*, 2 April 1855.
24. See <http://archiver.rootsweb.ancestry.com/th/read/Mariners/2005-11/1132509846>.
25. 'A Chinese Junk in London River', *P.L.A. Monthly* (January 1939): 59–62, states, 'Her staunch teak planking was used in building two ferry boats, one of them the *Victory*, and many souvenirs of her timbers were sold.' No reference is given for this claim; there is no trace of a regular Mersey ferry of the 1850s or 1860s being called the *Victory*. PLA stands for Port of London Authority.
26. See *Aberdeen Journal*, 21 November 1855; *Bristol Mercury*, 1 December 1855; and *Plymouth and Devonport Weekly Journal and Advertiser*, 6 December 1855.
27. See <http://www.plymouthdata.info/PP-Latimer.htm>.
28. Susan Simmons, private communication.
29. See <http://gazette.slv.vic.gov.au/images/1851/N/general/79-a.pdf> for the text of the Mercantile Marine Act 1850, formally *An Act for Improving the Condition of Masters, Mates, and Seamen and Maintaining Discipline in the Merchant Service*, 13 & 14 Vict. Cap 93. The 1854 act made this examined certification compulsory to skippers and mates in the home trade, too. Under the 1850 legislation, masters and mates who had already been serving in that capacity on foreign-going vessels before 1 January 1851 were granted Certificates of Service.
30. Susan Simmons, private communication.

31. According to *American Lloyd's Register of American and Foreign Shipping* of 1861, the *Northfleet* was a ship of 951 tons, built in Northfleet in 1853 and owned by D. Dunbar. The ship left London on 17 September 1853, arrived Wellington on 14 December 1853, Lyttelton on 13 January 1854 and Auckland on 2 February 1854.
32. That this is a perfectly reasonable conclusion to draw can be noted from the terms used in the *Daily News* advertisement on 6 September 1851 of the *Keying's* attractions: 'Chinese war demonstration by Natives, Admission 1s,' or on 2 October in the same year, 'the crew of Chinese sailors to give a Grand Assault of Arms, in addition to a Chinese Concert—Admission 1s.'
33. E. P. Thompson. *The Making of the English Working Class* (Harmondsworth: Penguin, 1968), p. 13.
34. *The Era*, 8 May 1853.
35. William Blakeney, *On the Coasts of Cathay and Cipango Forty Years Ago: A Record of Surveying Service in the China, Yellow and Japan Seas and on the Seaboard of Korea and Manchuria* (London: Elliot Stock, 1902), pp. 54–7. Blakeney was the paymaster of HMS *Actaeon*, at the time under the command of Captain Robert Jenkins.
36. Robert Jenkins (1825–1894) entered the Royal Navy in 1838, was made Lieutenant in 1846 and Commander in 1853. He fought in both the First and Second Opium Wars. He got his first command, HMS *Talbot*, in 1854 when he was sent to assist Edward Belcher's Arctic Expedition. He took command of HMS *Comus* in China in 1855 moving to the *Actaeon*, on the death of William Bate, in 1857 shortly after which he was promoted Captain. He was placed on the retired list as Rear-Admiral in 1875, with promotion to Vice-Admiral in 1880. T. R. Roberts, *Eminent Welshmen: A Short Biographical Dictionary of Welshmen Who Have Gained Distinction from the Earliest Times to the Present* (Cardiff & Merthyr Tydfil: The Educational Publishing Co. Ltd., 1908), vol. 1, p. 212.
37. I am extremely grateful to Lorence Johnston of Lok Man Rare Books, Hong Kong, for bringing this logbook to my attention and allowing me to extract and reproduce the relevant details.
38. Every British naval ship of the era had a component of the ship's company trained in the use of small arms (cutlasses, boarding axes and the standard long arm, the 1853 Enfield pattern rifled percussion musket). They would form the nucleus of boarding parties and, when needed, armed shore parties.
39. Iron screw storeship and troopship, 1593 tons burthen launched 19 February 1855, Commander Edward Lacy R. N. Launched as HMS *Resolute* in 1855 and renamed in 1857, she spent 1858–1860 on the China Station, returning from 1864–1871. She was decommissioned in 1877.
40. 長洲島, *Chángzhōu Dǎo*, also Dane's, Dane and Danish Island. It is the site of the foreigners' cemetery and, in 1924, of the famous Whampoa Military Academy established by Sun Yat Sen.
41. Others may also have remembered the humiliation and Robert Jenkins' role in it. We learn from Robert Hart's diaries that a few months later Robert Jenkins was 'attacked near Whampoa by braves in ambush. He was severely wounded as were also 6 or 8 of

- his men.' He notes a day later 'Village near Whampoa, where Jenkins was wounded, completely destroyed.' Katherine Bruner, John King Fairbank, Richard J. Smith (eds.), *Entering China's Service: Robert Hart's Journals* (Cambridge [Mass]: Harvard University Press Harvard East Asian Monographs, 1987), p. 193.
42. Alek Abrahams, 'The Chinese Junk Keying', *Notes and Queries* 6 (July–December 1906): 227. A naval architect called George Mackrow was apprenticed to Ditchburn & Mare, later the Thames Ironworks & Shipbuilding Co., in 1844 at their shipyard on the Blackwall side of Bow Creek. So the source of the piece of cable is more likely to have been via shipyard work on the *Keying* than service aboard; Archer Philip Crouch, *Silvertown and Neighbourhood (Including East and West Ham): A Retrospect* (London: Thomas Burleigh, 1900), p. 61.
 43. See <http://www.nyhistory.org/node/29514>, accessed on 10 September 2013.
 44. The spelling of surnames in the 1850s was still much in flux, so the additional 'r' may be of no significance.
 45. See Mrs. D. T. Davis, 'The Daguerreotype in America', *McClure's Magazine*, Vol. 8, No. 1 (November 1896), no page numbers, accessed at <http://daguerre.org/resource/texts/davis/davis.html> on 10 September 2013.
 46. That this prejudice continued to operate, to the great detriment of our knowledge of the world of Chinese nautical technology, can be noted from Hans van Tilburg's remarks (*Chinese Junks on the Pacific: Views from a Different Deck*. Gainesville: University Press of Florida, 2007, Ch. 1, especially pp. 1–2) about the traditional Chinese junks sailed across the Pacific to America in the early twentieth century: 'Early twentieth-century observers in America typically regarded Chinese sailing junks as quaint and unwieldy creations constructed in the fashion of sea monsters, general appraisals including a mixture of surprise and contempt.'

Chapter 8 What Kind of Vessel Was the *Keying*?

1. Régine Thiriez, 'Listing Early Photographers of China: Directories as Sources' at <http://pnclink.org/annual/annual2000/2000pdf/5-13-1.pdf>, accessed on 25 April 2010. For Thomson, see the National Library of Scotland's website on him: <http://www.nls.uk/thomson/china.html>. For Beato, see the beautifully produced catalogue, David Harris, *Of Battle and Beauty: Felice Beato's Photographs of China* (Santa Barbara, CA: Santa Barbara Museum of Art, 1999).
2. See E. H. H. Archibald, *The Dictionary of Sea Painters of Europe and America*, 3rd ed. (Woodbridge: Antique Collectors' Club, 2000). The inimitably precise E. W. Cooke, R.A., F.R.S. (1811–80) was active and at his peak during the years of the *Keying's* visit to London. The accomplished Samuel Walters (1811–82) was likewise at his flourishing peak (Sam Davidson, *Samuel Walters, Marine Artist—Fifty Years of Sea, Sail, and Steam* [Coventry: Jones Sands, 1992]); he had moved to London in 1845 to work with the late W. J. Huggins's son-in-law, the equally well-known marine artist Edward Duncan (1803–82) but had moved back to Liverpool by the

- time the *Keying* arrived in London in 1847, where, as we shall see, he would have had ample opportunity to capture this unique Chinese ship. It is curious that no marine artist of repute seems to have been interested.
3. F.-E. Pâris, *Essai sur la construction navale des peuples extra-européens, ou, Collection des navires et pirogues construits par les habitants de l'Asie, de la Malaisie du Grand Océan et de l'Amérique*, 2 volumes (Paris: Arthus Bertrand, 1841).
 4. *Dictionary of National Biography 1885–1900*, vol. 51, biographical sketch by Edward Milligen Beloe, at [http://en.wikisource.org/wiki/Seppings,_Robert_\(DNB00\)](http://en.wikisource.org/wiki/Seppings,_Robert_(DNB00)); accessed on 4 August 2010.
 5. 'Sagging' happens when a ship is supported by a wave at the bow and stern with the trough beneath her midships; 'hogging' is when the midships is supported but the ends not. 'Wracking' or 'racking' is when the hull is twisted along its longitudinal axis. René de Kerchove, *International Maritime Dictionary*, 2nd ed. (New York, Van Nostrand, 1961), s.vv.
 6. Hans van Tilburg, *Chinese Junks on the Pacific: Views from a Different Deck* (Gainesville: University of Florida Press, 2007), p. 58.
 7. As interesting is the fact that George Chinnery (1774–1852), still painting in the mid-1840s, was evidently wholly uninterested in the *Keying* and its progenitors. Chinnery spent only six months in Hong Kong at the end of 1845 and then went back to Macao, from which the *Keying* and its impending adventure were not such as to draw him back across the Pearl River estuary. See Patrick Conner, *George Chinnery 1774–1852* (London: Antique Collector's Club, 1999).
 8. Martyn Gregory, *Paintings of the China Coast by Chinese and Western Artists, 1790–1890* (London: Martyn Gregory Gallery, 1990), p. 48.
 9. See Joseph Needham's seminal *Science and Civilization in China*, vol. 4: *Physics and Physical Technology* (Cambridge: Cambridge University Press: 1971), p. 501. Given the etymology of the word *junk*, and its established use in the India Ocean area to describe a large ship from the Eastern Archipelago or China, we have no fundamental reason to pick a Chinese over an Arab or Indian vessel as the cited venture (see Pierre-Yves Manguin, 'The Southeast Asian Ship: An Historical Approach', *Journal of Southeast Asian Studies* 11, no. 2 [1980]: 266–76).
 10. By the early twentieth century, transpacific voyages by contrast were quite numerous, see Hans van Tilburg, *Chinese Junks on the Pacific*, in which the stories of ten of these adventurous voyages are reviewed.
 11. I have discovered a total of thirteen images of the *Keying*, with one—the Skillett painting—known only by title. They are itemized in the List of Illustrations. Three of the images—the Chinese artist's gouaches and the Joseph Rock engraving—owe debts to each other. The direction of influence is not clear, though one's sense is that the gouaches were the original and the engraving was based on them. The Rock Brothers and Payne lithograph would also appear to have some affinity to the gouaches. By contrast, the Currier lithograph was obviously taken from life and the Edmund Evans image entirely invented. The *Illustrated London News* image by Foster, that by the unknown artist in the *Description*, and the *Keying* in Samuel Waugh's painting have a very strong family resemblance, connected, one suspects,

by imitation. The image by Greenaway and that published by Vickers are quite different from all the others and from each other, and possibly not based on direct observation though probably derivative of the entirely fictional image of Edmund Evans.

12. *Description*.
13. David Bland, *A History of Book Illustration: The Illuminated Manuscript and the Printed Book* (Cleveland: World Publishing Company, 1985). Patricia J. Anderson, *The Printed Image and the Transformation of Popular Culture, 1790–1860* (Oxford: Clarendon Press, 1991). See also the useful catalogue from the British Library, *Aspects of the Victorian Book* at <http://www.bl.uk/collections/early/victorian/intro.html> and the quirky but helpful review of graphic art, from a largely American perspective, at <http://graphicwitness.org/ineye/index2.htm>.
14. A parallel and familiar example is the exaggeration of verticality, ruggedness and wildness in mountainscapes of painters of the Romantic period, with their focus on the ‘sublime’ in order to evoke feelings of ‘surprise, terror, superstition, melancholy, power, strength’, as John Constable put the matter. The Romantic ‘discovery’ of nature and the sublimity of the wild required a manner of depiction that highlighted those features for the viewer. See Bruce MacEvoy’s excellent discussion in ‘The Poetic Landscape’ at <http://www.handprint.com/HP/WCL/artist03.html>; accessed on 24 April 2010.
15. It is worth noting that, in the 1840s, to write of ‘scientific’ naval architecture is rather to anticipate matters. The practice of naval architecture as a scientifically based technology was extremely young in 1840s Britain. While the dawn of scientific naval architecture can be traced to the mid-eighteenth century in France (for example, Pierre Bouguer’s *Traité du navire* of 1746), in Britain a more practical, apprenticeship-based approach prevailed until the early to mid-nineteenth century. When the change came, however, it came from outside. In the 1840s, the rising generation, like Froude and Brunel, were engineers, not naval architects. It was their railway- and bridge-engineering expertise, not their knowledge of the principles of hydrodynamics, that transformed ship design as iron cladding and steam engines transformed ships; see Sir Westcott Abell, *The Shipwright’s Trade* (London: Conway Maritime Press, 1981), part 3, para. 9, ‘The Sorrows of Science’, pp. 149–57. It is perhaps symptomatic of the British prejudice that Sir Westcott Abell chose the title for his book that he did and does not get around to mentioning naval architecture as a profession until page 152. The Institution of Naval Architects, one might note, was not founded until 1860.
16. *Description*, p. 13.
17. *Description*, p. 14.
18. For representative images, see Jim Harter (ed.), *Nautical Illustrations: 681 Permission-Free Illustrations from Nineteenth-Century Sources* (New York: Dover Publications, 2003).
19. William John Huggins (1781–1845) is unknown to the records before he became a seafarer with the East India Company. He was signed on the *Perseverance* (under

- Captain Thomas Buchanan) as an ordinary seaman, but served as the captain's steward on a voyage to China from 1812 to 1814. Where he learned to paint is obscure, but his first painting is recorded, possibly apocryphally, as dating from the year the *Perseverance* returned to London. He first exhibited at the Royal Academy in 1817 and exhibited at the British Institution regularly after 1825. He was appointed a marine-painter to both George IV and to William IV. While his paintings were favoured by sailors, artists and art critics were less impressed. Huggins died at his home and studio of twenty-two years, 105, Leadenhall Street, London, on 19 May 1845. Pieter van der Merwe, 'Huggins, William John (1781–1845)', *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004); online ed., January 2012, <http://www.oxforddnb.com/view/article/14053>; accessed on 9 February 2013.
20. One thinks particularly of the famous Qing dynasty depiction of an ocean-going junk, probably a *fuchuan*, in Zhou Huang's *Account of the Liu Chiu Islands*, reprinted in Needham, *Science and Civilization in China*, vol. 4, pt. 3, p. 405.
 21. Sam Davidson, 'What Makes a Marine Artist?' in his *Marine Art and the Clyde: 100 Years of Sea, Sail and Steam* (Upton: Jones-Sands, 2001), p. 15.
 22. See, for a vivid demonstration of the requisite technique, the short video on YouTube by Danish artist Alek Krylow at http://hk.youtube.com/watch?v=h0p_aFWDSok.
 23. G. R. G. Worcester, *Junks and Sampans of the Yangtze* (Annapolis, MD: Naval Institute Press, 1971), p. 603.
 24. *Ibid.*
 25. These images are 1) the best known coloured print of 1849 by Beck Bros; 2) the engraving in *The Illustrated London News* of 1 April 1848; 3) Samuel Waugh's painting of the *Keying* lying off the Battery, New York, in the collection of the Museum of the City of New York; 4) a German engraving of the *Keying* under what may be reduced sail; 5) an image by J. Greenaway in vol. 3 of Walter Thornbury's *Old and New London: A Narrative of Its History, Its People and Its Places. Illustrated with Numerous Engravings from the Most Authentic Sources* (London/New York: Cassell, Peter & Galpin, 1872–78); and 6) the images limned on the celebration medals by Halliday, Davis and others. Two of the four prints and the Currier can be found in the collection of prints and watercolours obtained by Iwasaki Hisao from G. E. Morison in 1917 and viewable at http://61.197.194.13/gazou/Honkon_dohanga-e.html. The three images are catalogue numbers E-3-8, E-3-9 and E-3-10.
 26. Sean McGrail (*Boats of the World from the Stone Age to Medieval Times*, Oxford: Oxford University Press, 2001, p. 381) gives the traditional Guangdong rule-of-thumb proportions, unquestionably very similar to those of Fujian, which he summarizes from L. Liu and C. Li, 'Characteristics of Guangdong Wooden Junks' in *Proceedings of the International Sailing Ship Conference*, edited by S. Zhang (Shanghai: Society of Naval Architecture and Marine Engineering, 1991), pp. 275–85.
 27. In a private communication.
 28. See above, Ch. 3. One possible source for this may be the *Account* (p. 4), where the author notes the junk had been bought 'after she had returned from Cochin China, to which country she had carried some Mandarins of high rank'.

29. This and many other aspects of Chinese regional design variations are well canvassed in van Tilburg, *Chinese Junks on the Pacific*, p. 56. Tilburg is citing Worcester's *Sail and Sweep in China*, p. 17. Against this must be placed the shape of the bow of the Foochow (Fuzhou) pole junk depicted in Worcester, *Junks and Sampans of the Yangtze*, pp. 188–9, and the plate of the Science Museum model of the 'Fukien sea-going junk', in *Sail and Sweep* (Plate 8), which clearly has the upswept 'wings'.
30. A consideration of the comprehensive reviews of typical early mid-twentieth-century traditional Vietnamese sailing craft given in Pierre Paris, *Esquisse d'une ethnographie navale des peuplespeoples Annamites*, 2nd ed. (Rotterdam: Museum voor Land- en Volkenkunde en het Maritiem Museum "Prins Hendrik" Rotterdam, 1955) and J. B. Piétri, *Voiliers d'Indochine*, new ed. (Saigon: S.I.L.I, 1949) reveals no commonality in conformation, rig or construction between any Vietnamese craft and any feature of the *Keying*.
31. These images were originally thought to originate from the early seventeenth century. Careful scholarly work by Professor Oba Osamu and a cross-correlation of Oba's findings with work done separately on a copy of the scroll in Australia by Captain Ian MacRobert, brokered by Joseph Needham, has resolved the dating question, concluding that Oba's late eighteenth century date of 1795 is correct. See <http://janus.lib.cam.ac.uk/db/node.xsp?id=EAD%2FGBR%2F1928%2FNRI%2FSC6%2F36>, where the Needham archive's holdings on this matter are excellently and clearly displayed. Oba published his work as 'On the Scroll of Chinese Ships in the Possession of the Matsuura Museum—Materials for the Study of Chinese Trading Ships in Edo Period', *Bulletin of the Institute of Oriental and Occidental Studies of Kansai University* 5 (March 1972): 13–50. The most important feature of the images are the careful annotations which give names and dimensions, making these images the closest known from the Asian tradition of the 'General Arrangements' sheets of Western-style lines drawings.
32. That is, the deep-sea as opposed to coasting (or *nanyang*) trade, although the vocabulary here does not seem to have been absolutely fixed, *nanyang* (see next note) referring as well to the Chinese diaspora in Southeast Asia.
33. The late Jennifer Wayne Cushman's fascinating *Fields from the Sea: Chinese Junk Trade with Siam during the Late Eighteenth and Early Nineteenth Centuries* (Ithaca, NY: Cornell Southeast Asia Publications Program, 1993), p. 53, marks the resemblance of the *Keying* to a *fuchuan*, as well as commenting in general (pp. 48–58) on the effective hegemony of *fuchuan* styles in the ocean-going trading junks of the *nanyang*.
34. This is a slightly abbreviated discussion. In fact, more or less at the waterline and below in a *fuchuan* the planking does converge on rising elements of the keel which act as stem- and sternpost; however, above that point one finds the triangular or trapezoidal bow plate and ovate transom characteristic of the *fuchuan* design, which have the effect of making the planking above the waterline less steeply inclined at the ends than in comparable carvel or clinker-built Western vessels.

35. The Hong Kong Maritime Museum has an antique model of a *fuchuan* dating from sometime around the mid-nineteenth century, which shares this tendency to exaggerate the beam-to-length ratio, resulting in a junk that looks shorter and fatter than we have reason to believe was the case, from traditional rules-of-thumb or such scrupulous portrayals of traditional craft as can be found in Pâris, *L'Essai sur la construction navale des peuples extra-européens*.

Chapter 9 A Re-appraisal of the *Keying's* Likely Shape

1. G. R. G. Worcester, *The Junks and Sampans of the Yangtze* (Annapolis, MD: Naval Institute Press, 1971), pp. 603–5; L. Audemard, *Juncos Chineses* (Macao: Museo Maritimo de Macao, 1994), pp. 150–1.
2. This, of course, is typical of the entire problem. We read of the teak build, but there is no evidence that the *Keying* actually was built of teak. Fujian pine (松木, *song mu*, or *pinus massoniana*) is characterized as a hard wood, with age becoming extremely hard. Worcester (*Junks and Sampans of the Yangtze*, pp. 187–94) comments that, in a traditional Fuzhou pole junk, the transverse bulkheads, wales, timbers and many other critical timbers are all of this hardwood. Only the planking is made of softwood, the Fujian fir (杉木, *shan mu*, or *Cunninghamia lanceolata*). This too, when aged and long pickled in salt water, hardens and darkens, so with a junk between fifty and one hundred years old, a misidentification of the wood from which she was built, in default of any laboratory analysis, would not be surprising. Equally, on the ‘grandfather’s axe’ theory, selective or even wholesale re-planking in the course of a very long life might have been in teak.
3. The fifteen compartments are exactly the number typical of a Fujian *huapigu* (花屁股, literally ‘flowery arse’, describing the highly decorated transom), of which the *Keying* has been said to be an example; see Worcester, *Junks and Sampans of the Yangtze*, p. 184, and for the *Keying* references, pp. 603–5.
4. Including the writer of the *Description*. See also Worcester, *Junks and Sampans of the Yangtze*, p. 34, and *Sail and Sweep in China: The History and Development of the Chinese Junk as Illustrated by the Collection of Models in the Science Museum* (London: HMSO, 1966), p. 8, where he remarks, ‘The work of the Chinese shipwright, although ingeniously conceived and skilfully carried out, is of the crudest. This necessarily makes the caulkers’ task a formidable one.’ This is not to say that all Chinese shipwrights’ work was crude and rough, but the workaday vessel is unlikely to have been exemplary of the finest work, any more than were workaday craft elsewhere.
5. I. A. Donnelly, *Chinese Junks and Other Native Craft* (Shanghai: Kelly & Walsh, 1930).
6. Joseph Needham et al., *Science and Civilization in China*, vol. 4: *Physics and Physical Technology* (Cambridge: Cambridge University Press: 1971), p. 413, though Needham, does note (p. 480) that in the high days of Ming maritime power, during the period of Zheng He’s Treasure Fleets, there was a design office in Nanjing where

the chief designer and builder, Jin Bifeng, made ‘many working drawings (*thu yang*)’ (圖樣, *túyàng*), without, however, any further detail on exactly what sort of drawings these were. Certainly, the working drawings in the *Longjiang Shipyard Treatise* are crude ‘lists of parts’ more to act as visual *aides mémoires* than anything remotely resembling a working drawing in the accepted modern meaning of that term.

7. See the introduction. The full argument of this position is too long to recapitulate here, but will be presented in a later article discussing the history and development of Chinese axially mounted steering systems. Van Tilburg’s discussion is a useful overview (though he appears not to have read very thoroughly L. V. Mott’s *The Development of the Rudder: A Technological Tale* [London: Chatham Publishing / College Station: Texas A&M University Press, 1997]).
8. *Description*, p. 12.
9. See the analysis of known wrecks recovered by archaeologists in Sean McGrail, *Boats of the World from the Stone Age to Medieval Times* (Oxford: Oxford University Press, 2001), pp. 366–79, and the detailed cross-sectional line drawing of a Kiangsu (Jiangsu) trader, showing its keel timber, in Worcester, *Junks and Sampans of the Yangtze*, p. 164, or, more pertinently, the evident keel in the detailed drawings of a *huapigu* on pp. 188–9. There is a good discussion of this issue in Van Tilburg, *Chinese Junks on the Pacific*, pp. 60–3.
10. Worcester is citing H. H. Brindley, ‘The Keying’, *The Mariner’s Mirror* 8, no. 4 (1922): 305–14. There was a subsequent article by L. G. Pritchard. ‘Chinese Junks [Keying 1806–1912, incl compartments]’, *The Mariner’s Mirror* 9 (1923): 89–91.
11. *Description*, p. 8.
12. Information from the late Mr. Geoffrey Bonsall and also from the *Account*, p. 5.
13. Though it is worth noting that in the report on the *Keying* in the *Aberdeen Journal*, 18 August 1847, the height of the stern above the water is given as 32 feet, not 38, above the water. I am indebted to Susan Simmons for this newspaper clipping.
14. *Description*, p. 1.
15. The hint at a different interpretation, although had it been true it would not have argued for a massive increase in laden displacement, was an advertisement in *The Times*, 16 May 1848, p. 11. It reads: ‘Arrival of the Chinese Junk Keying. Just landed, and for SALE, the following beautiful productions from CHINA: CHINESE LACKERED LOO TABLES, ladies work tables, tea-caddies, cigar-boxes, work-boxes with ivory fittings, mandarin jars from five to 60 inches high, pagodas, junks, old bronzes, gongs, cups and saucers, paintings on rice paper, ivory fans, paper ditto, silk and ivory-faced hand screens, and a thousand other curious and beautiful articles from Canton and Shanghai, at extraordinarily low prices. W. Hewett and Co. Chinese warehouse, 18 Fenchurch-street.’ It would have been intelligent for the *Keying* to have carried a cargo. However, this is almost certainly a London businessman capitalizing on a heaven-sent opportunity.
16. *Daily News*, 26 August 1847.
17. *The Morning Chronicle*, 11 March 1848. I owe both these references to Susan Simmons.

18. *Description*. It is fairly clear that the pamphlet is the work of a jobbing writer who has been given detail by Captain Kellett which he does not necessarily understand. As much to the point, it is not in fact likely that Kellett was either a competent naval architect or shipbuilder—he would merely have had a sound seaman's grasp of the basic structure of ship—nor that he had more than the slightest passing acquaintance with, and that through the eyes of deeply engrained prejudice, the techniques and practices of traditional Chinese shipbuilding. Captain Kellett was a fine seaman. He was not a marine ethnographer.
19. *Description*, p. 10.
20. It should be noted that Chinese ironwood is not always the same as what is normally meant by the English term. As Needham points out (*Science and Civilization in China*, vol. 4: *Physics and Physical Engineering*, p. 646, fn.b), 'there are a number of tropical woods known as ironwood: e.g. *Casuarina equisetifolia*, *Fagraea gigantean*, *Intsia bakeri*, *Maba buxifolia* and *Mensua ferrea*'; he adds (ibid. p. 416, fn.g), *Tsuga sinensis* as well. An online source lists twenty-one different tree species that are called ironwood (see <http://encyclopedia.thefreedictionary.com/ironwood>). Further confusion is added when one realizes that Cantonese shipwrights sometimes refer to Malaysian *chengal* (*Neobalanocarpus heimii*) as either ironwood or teak!
21. *Description*, p. 8.
22. *Description*, facing p. 14.

Chapter 10 The Keying's Dimensions and Shape

1. *Description*, p. 12.
2. Paul van Dyke, *The Canton Trade: Life and Enterprise on the China Coast, 1700–1845* (Hong Kong: Hong Kong University Press, 2005), pp. 24–30.
3. William Milburn, *Oriental Commerce of the East India Trader's Complete Guide* (London: Kingsbury, Parbury & Allen, 1825), p. 468. See also J. Chalmers, 'The Chinese Ch'ih Measure', *China Review* 13 (1884): 332–6, where a value for the 'cubit' in Canton is given as 14.1 feet. Samuel Wells Williams (*A Chinese Commercial Guide*, 4th ed., Canton: The Chinese Repository, 1856, p. 300) offers a range between 12.1 and 14.81 feet, with 14 feet 1 inch as the tariff measure.
4. Joseph Blunt, *The Shipmaster's Assistant and Commercial Digest* (New York: E. & G. W. Blunt, 1837; reprinted London: Macdonald and Jane's, 1974), p. 426.
5. Milburn, *Oriental Commerce*, pp. 415, 445 and 527. In various Western sources, there is a curious hesitancy to give any value to linear measures used in Canton, for example J. H. Tuckey, *Maritime Geography and Statistics*, vol. 3 (London: Black, Parry & Co., 1815), p. 547.
6. G. R. G. Worcester, *Sail and Sweep in China: The History and Development of the Chinese Junk as Illustrated by the Collection of Models in the Science Museum* (London: HMSO, 1966), p. xi: 'the Chinese commercial guide gives 100 different values of the ch'ih (*chi* 尺) as actually in use'.

7. William C. Hunter, *An American in Canton (1825–1844): A Reprint of The Fan Kwae at Canton before Treaty days (1825–1844) and Bits of Old China*, edited by G. Bonsall (Hong Kong: Derwent, 1994), p. 60.
8. This is a common manner of reference; *The Oxford Encyclopaedia of Maritime History*, vol. 4, edited by John B. Hattendorf (Oxford: Oxford University Press, 2007) p. 143, for example, gives length on deck as the value for ‘L. In fact, the 1773 act, quoted by D. R. MacGregor, *Fast Sailing Ships: Their Design and Construction, 1775–1875*, 2nd ed. (London: Conway Maritime Press, 1988), p. 271, is unequivocal: “The length shall be taken on a straight line along the rabbet of the keel of the ship, from the back of the main-post to a perpendicular line from the fore part of the main-stem under the bowsprit; from which subtracting three-fifths of the breadth, the remainder must be esteemed the just length of the keel to find the tonnage . . .”
9. Sean McGrail, *Boats of the World from the Stone Age to Medieval Times* (Oxford: Oxford University Press, 2001), pp. 245, 164, 276 and 381.
10. See http://brunelleschi.imss.fi.it/michaelofrhodes/ships_design.html; accessed on 2 August 2010.
11. Fernando Oliveira, *Liura da fabrica das naos* (Academia de Marinha/Museu Marítimo de Macao, 1995), pp. 165–6 (a beautifully produced trilingual edition). For an excellent summary of extant texts reflecting such practices in Europe, see Texas A&M University’s outline at http://nautarch.tamu.edu/shiplab/index_03treatises.htm; accessed on 2 August 2010.
12. They are translated and adumbrated in McGrail, *Boats of the World*, p. 381, from L. Liu and C. Li, ‘Characteristics of Guangdong Wooden Junks’, in *Proceedings of the International Sailing Ships History Conference*, edited by S. Zhang (Shanghai: Society of Naval Architecture & Marine Engineering, 1991).
13. For the application of the rules of thumb to the last examples of South China coastal trading junks, see Stephen Davies, *Coasting Past: The Last South China Coastal Trading Junks Photographed by William Heering* (Hong Kong: Hong Kong Maritime Museum, 2013).
14. *Ibid.* Utter confusion as to the difference between displacement (roughly, all up weight) and measurement tonnage (measured internal volume) is remarkably common in writing about the sea.
15. See, for example, A. W. Sleeswyk, ‘The *Liao* and the Displacement of Ships in the Ming Navy’, *The Mariner’s Mirror* 82 (1996): 3–13; Richard Barker, ‘The *Liao* and the Displacement of Ships in the Ming Navy: Defoe’s View of Chinese Claims, c. 1700’, *The Mariner’s Mirror* 82 (1996): 484; John F. Coates and David K. Brown, ‘The *Liao* and the Displacement of Ships in the Ming Navy’, *The Mariner’s Mirror* 82 (1996): 484.
16. There is an alternative that on one reading might be implied by the *Longjiang Shipyard Treatise*. This is that the *liao* in question has nothing to do with the size of the completed vessel, whether carrying capacity or total capacity, but is instead a measure of the volume of all the timber, or possibly the main keel, wales, framing and planking timbers required to build a given vessel.

17. As a previous note indicates, it is extremely important to keep distinct in the mind the difference between a *tonne* as a measurement of mass (or weight, in popular parlance)—*displacement*, as the nautical term has it—and a *ton burthen* or *measurement ton*, which is a measure of carrying capacity, assuming, today, that 100 cubic feet of volume accommodates the mass of a notional average tonne of cargo. There is no strict relationship between measurement tonnage and displacement; one cannot be derived from the other.
18. One gill, or 142.0653125 millilitres, is a quarter of an imperial or customary British pint. A standard pub measure of a quarter gill is today 35 millilitres.
19. In Tang Zhiba, Xin Yuanou, Zheng Ming, ‘The Initial Textual Researches and Restorations Studies on Zheng He’s 2000 *Liao* Wooden Treasure Ships (the 5th version)’, *Zhenghe’s Voyage Studies* 2 (2005): 32–48, a formula for calculating *liao*, referenced to Chen Xiyu, *Chinese Junks and Overseas Trade* (Xiamen: Xiamen University Press, 1991) is given as (length of keel x beam x moulded depth) x 10, where measurements are in *zhàng* (丈). Using the data from the *Longjiang Shipyards Treatise*, this formula is wrong by an order of magnitude, and even when corrected becomes less and less accurate as the size of vessel increases, as Table 13 shows.

Table 13 The Tang/Xin/Zheng formula for *liao* corrected

Junk size (<i>liao</i>) in treatise	Length of keel in 尺	Beam in 尺	Moulded depth in 尺	<i>liao</i> by formula	<i>liao</i> by Tang/ Xin/Zheng formula corrected
100	34.2	8.1	3.7	1025.0	102.5
200	42.5	12.6	4.5	2409.8	241.0
400	60.5	16.5	6.0	5989.5	598.9
600	86.7	19.6	7.8	13328.2	1332.8
800	120.0	22.5	10.3	27854.7	2785.5

20. Though in most instances in China, the designs of warships and merchant vessels were not greatly different.
21. A good general discussion of this issue can be found in Endymion Wilkinson, *Chinese History: A Manual*, revised and enlarged edition (Cambridge, MA: Harvard University Asia Center, 2000), pp. 234–40. Worcester, *Sail and Sweep in China*, p. xi, notes that, when he was gathering data in the 1930s, ‘the Chinese commercial guide (gave) 100 different values of the *ch’ih* (Chinese foot) as actually in use.’
22. One possible source of difference might be the respective ratio of length-on-deck to length-of-keel in Chinese and European traditions. In the *Longjiang Shipyards Treatise*, length-of-keel and length-on-deck are given for twenty-one vessel types. With the exception of two barges for which, not surprisingly, ratios are close to 1:1, the majority have a ratio of between 1:0.65 and 1:0.75, with an average of 1:0.69. A quick comparison with typical European ships listed

in R. Gardiner (ed.), *The Heyday of Sail: The Merchant Sailing Ship 1650–1830* (London: Conway Maritime Press, 1995), pp. 33 and 54, using the ratio of keel = 3 x beam, given in W. Hutchinson, *A Treatise on Naval Architecture*, 4th ed. (Liverpool: T. Billinge, 1794; reprinted London: Conway Maritime Press, 1969), pp. 35–6, shows the European examples to favour a range of 1:0.8 to 1:0.9.

23. *Description*, p. 12.
24. The point is simple. All rules can be evaded by design which exploits the loopholes. The BOM, precisely because it penalized beam but, for calculation purposes, treated moulded depth as half the beam (a ratio that had been true for most European vessels until the early eighteenth century), led to designers producing ever relatively narrower, deeper vessels. The result was a change to tonnage measurement in 1854, following the recommendation of the Moorsom Committee of 1849, whose secretary was Admiral George Moorsom. Moorsom's committee devised the formula for tonnage measurement used throughout the steamship era that was superseded, though not significantly varied, only following the 1969 International Convention on Tonnage, that was in force from 1982 to 1994.

Chapter 11 How Fast Could She Go?

1. I owe the waterline length figure, a best estimate, to a combination of the *Illustrated London News* picture and a photograph in the collection of the Nimitz Library, U.S. Naval Academy, Annapolis, of a junk from Shantou (Swatow) that looks very like the *Keying*. It was taken in China by Lt. J. G. Moses Lindley Wood in 1884–85. Dimensionally, the vessel in the photograph fits reasonably, so is no bad guide; it is controlled by data from other sources. Length of keel is an estimated length of the keel plank. Displacement has been recalculated, to cross-check the figures we have, based on a simplified formula from <http://boatdesign.net/forums/showthread.php?t=930>, where wetted surface area = $(L \times [B + T]) \times 0.75$, added to the author's own rough formula for area above the waterline = $(2 \times L \times F) + (bB \times bF) + (tB \times tF)$ (where L = overall length, B = beam, T = draught, F = freeboard, bB = average beam across bow section, bF = average freeboard at bow, tB = beam across transom, tF = average freeboard at transom). To this is added $([0.87 \times L] \times D)$, $(7 \times B \times D)$ (where D = moulded depth) for the internal bulkheads (the *Keying* had fifteen athwartships bulkheads) and $L \times B$ for the deck. This is multiplied by 0.7 on the assumption of 8-inch-thick planking (a probable underestimate) for the gross volume of timber in the vessel. The cubic footage of timber is then multiplied by 43 pounds (the weight of teak per cubic foot) and divided by 2,240 to get long tons. The result is a displacement probably to within ± 10 to 15 percent of actuality. Best average speed is based on the *Keying* having taken 26 days to cross the Atlantic, from Boston to the English Channel. The sail area–to–displacement ratio is based on the mid-value displacement, though given that the ship was in ballast, the performance potential may have been better.

2. Jean Sutton, *Lords of the East* (London: Conway Maritime, 1981), p. 94.
3. *Ocean Passages for the World*, 4th ed. (Taunton: Hydrographer to the Navy, 1987), p. 182.
4. See Klaas van Dokkum, *Ship Knowledge, Ship Design, Construction and Operation*, 5th ed. (Enkhuizen: DOKMAR, 2008), pp. 34–6.
5. D. R. MacGregor, *Fast Sailing Ships: Their Design and Construction, 1775–1875*, 2nd ed. (London: Conway Maritime Press, 1988), p. 247.
6. Van Dokkum, *Ship Knowledge, Ship Design*, p. 135.
7. MacGregor, *Fast Sailing Ships*, p. 20, citing Howard Chapelle's *The Search for Speed under Sail, 1700–1855* (New York: W. W. Norton, 1967), pp. 43–5 and 404–7.

Chapter 12 Voyage Over

1. The eminent British banking house acted for many of the best-known Western trading firms in China, including Russell & Co., Augustine Heard & Co., Nye Parkin & Co., etc.
2. See *Official Catalogue of the Great Exhibition of the Works of Industry of All Nations, 1851*, corrected edition (London: Spicer Bros., 1851), p. 216.
3. When the *Sulphur* and her tender the *Starling* had been in South America in 1839, prosecuting their researches, they were told to drop everything and make haste for the Pearl River Delta, where they formed the spearhead of an impressive Royal Navy concentration of hydrographic surveyors, whose work was to prove of signal importance in the British campaign.
4. It is frequently but mistakenly assumed, that Henry and Charles Kellett were related, if only on the wrong side of the blanket. They do not appear to have been. No connection has been found between the modest Plymouth and Ulverston Kellett families and the more distinguished Irish Kelleths from Clonacody House, Fethard, Co. Cork, Ireland, who settled in Ireland in the early 18th century. Much work by Charles Kellett's descendants has turned up no background information about Charles Kellett's childhood or parentage. See for Henry Kellett <http://fethard.com/index.php?topic=115.0> and <http://www.clonacodyhouse.com/History.html>
5. Sir John died eight months after the *Keying* docked at Blackwall. That the Franklin expedition's ships may have foundered was discovered by a joint British-American effort in 1850. What actually happened to Franklin was discovered by the Scottish doctor and explorer Dr. John Rae in 1854, but because it went against the heroic image fostered by Lady Franklin and, worse, suggested that these paragons of heroism had resorted to cannibalism, Rae was ignored and ostracized. Victorian Britain preferred not to entertain heterodox ideas about itself; as with Chinese naval architecture, so with Arctic blundering. Interestingly, three of the British naval officers caught up in the Franklin farrago could well have crossed our story's path. Sir Edward Belcher, Henry Kellett and Richard Collinson had all been participants in the First Opium War and went on to join the select band of nineteenth-century

- explorers and surveyors. Sir Edward was voyaging and surveying in China and Southeast Asia in the *Samarang* in 1841–47. Kellett and Collinson were surveying on the China coast in the *Plover* and *Young Hebe* in 1841–46. All got tangled up in the search for Franklin: Belcher in the *Resolute* 1852–54; Kellett in the *Herald* in 1848–52; Collinson in the *Enterprise* 1850–55. See Fergus Fleming, *Barrow's Boys: The Original Extreme Adventurers—A Stirring Story of Daring Fortitude and Outright Lunacy* (London: Granta, 2001).
6. For the teapot, see Victoria and Albert Museum item C.262:1, 2-1993 at <http://collections.vam.ac.uk/item/O8088/henry-cole-tea-service-oxford-teapot-cole-henry-sir/>. The V&A's collection notes give a strong indication of why Cole and teapots were not a stimulus to Cole on China—the design inspiration was classical Greek.
 7. Henry Cole, *Fifty Years of Public Work of Sir Henry Cole, K.C.B., Accounted for in His Deeds, Speeches and Writings*, 2 vols. (London: George Bell & Sons, 1884), vol. 1, p. 279.
 8. See http://www.sciencemuseum.org.uk/about_us.aspx; accessed on 24 April 2010.
 9. An interesting exercise in exactly this approach, some 165 years after it could first have been essayed, was conducted by the naval architect Michael Trimming; see Michael S. K. Trimming, 'The Pechili Trader: A Hull Lines Plan', *The Mariner's Mirror* 97, no. 3 (2011). Trimming sees, for example, that the trader's cargo compartment design conformed remarkably well to modern self-trimming designs for bulk carriers; the Pechili trader's typical load was a bulk cargo.
 10. *Official Catalogue of the Great Exhibition*, pp. 50–4.
 11. Sean McGrail, *Boats of the World from the Stone Age to Medieval Times* (Oxford: Oxford University Press, 2001), p. 349.

Appendix: The Images of the Keying

1. Currier was a pioneer lithographer in the United States having learned his craft from William and John Pendleton of Boston, who had introduced lithography to America and to whom Currier had been apprenticed. He was well-established by the time of the *Keying* visit. It was with the advent of James Merrit Ives (1824–1895) to the business in 1850, and his partnership to form Currier & Ives in 1857, that the firm became the premier popular image publisher in the United States, with some 7,500 images in their list between 1834 and 1907, when the firm was liquidated. Information on Nathaniel Currier comes principally from the Currier and Ives Foundation at <http://www.currierandives.com/history.html>, but also Morton Cronin, 'Currier and Ives: A Content Analysis', *American Quarterly*, Vol. 4, No. 4 (Winter 1952): 317–30.
2. *The Pictorial Times*, Volume X, Issue No. 231, Saturday 14 August 1847, p. 100.
3. A careful review of the two paintings suggests that they are the work of a single hand. I am indebted to Patrick Conner of the Martyn Gregory Gallery for providing a copy of the second image.

4. I owe this insight to Anthony Hardy, by whom I was introduced to the art and artists of the China Export School and from whom I have learned much.
5. The company was founded by William Frederick Rock (1802–90). After schooling in London, he became a partner with the playing card maker Thomas De La Rue in the 1820s before setting up business as a fancy stationer with his brother Henry in 1833 at 8, Queen Street 1833–38. Around that year they were joined by their younger brother Richard and moved premises to 11, Walbrook, where the business stayed until 1895. They traded as William and Henry Rock 1833–38; as Rock and Co. 1838–95. In 1845 John Payne became a partner at which point they also traded as Rock Brothers and Payne. Their business as fancy stationers included pictorial writing paper with steel line engraved vignettes. See Ralph Hyde, 'A year for celebrating W. F. Rock', *Print Quarterly* 19 (2002): 341–52 and <http://www.devon.gov.uk/print/index/cultureheritage/libraries/localstudies/lisdatabase.htm?url=etched/etched/100127/1.html>.
6. There were evidently at least two editions of this image, a later version replaced the original caption with details of the voyage with one that read, "The Royal Chinese junk, Keying: the first vessel of Chinese construction which ever reached Europe, now on view at the Temple-Bar Pier, Essex St. Strand London, manned by a Chinese crew, under the command of the Mandarin Hesing, of Canton, the preparer of the celebrated Hesing's mixture of royal Chinese junk teas."
7. Myles Birket Foster (1825–99) served his apprenticeship with the notable wood engraver, Ebenezer Landells, working on illustrations for *Punch* magazine and *The Illustrated London News*. He later left Landells employment, though continued working for *The Illustrated London News* and *The Illustrated London Almanack* and became a popular illustrator, watercolour artist and engraver.
8. Ebenezer Landells (1808–60) was a pupil of the eminent engraver Thomas Bewick (1753–1858). He moved to London in 1829 and began his own engraving workshop, becoming one of the founders of *Punch* in 1841, though financial difficulties meant his involvement was short-lived. When *The Illustrated London News* was founded in 1842, Landells became its first artist correspondent and worked for the magazine until his death. He was one of the most important of Victorian illustrators.
9. In *Shipbuilding & Shipping Record: A Journal of Shipbuilding, Marine Engineering, Dock, Harbours & Shipping* 78 (October 1951), Commander Hilary Poland Mead, RN, noted that there were no rules on what was or was not a courtesy flag where there were differences between the national flag and the merchant ensign. There still are none, just conventions.
10. See Martyn Gregory, *Paintings of the China Coast*, 1990.
11. A copy is also in the G. E. Morrison Collection of images in the Toyo Bunko archive in Tokyo, catalogue number E-3-10, see http://61.197.194.13/gazou/Honkon_dohanga-e.html.
12. See Kevin J. Avery, 'Movies for Manifest Destiny: The Moving Panorama Phenomenon in America', in Kevin J. Avery and Tom Hardiman, *The Grand Moving Panorama of "Pilgrim's Progress"*, Montclair, NJ: Montclair Art Museum, 1999. The

- painting was not part of Waugh's original 1849, 2.4 m (8') high, fifty-scene panorama of the tour—the 'Mirror of Italy'—but was painted later when the panorama was extended to 800' in length to create the later, longer 'Italia'.
13. Edward Walford, *Old and New London: A Narrative of Its History, Its People, and Its Places. Illustrated with numerous engravings from the most authentic sources: Westminster and the Western Suburbs*, vol. III, London: Cassell Petter & Galpin, 1878, Ch. xxxvii, p. 289.
 14. Richard D Altick, *The English Common Reader: A Social History of the Mass Reading Public*, 2nd ed., Columbus: Ohio State University Press, 1998; Kay Boardman, "Charting the Golden Stream": Recent Work on Victorian Periodicals, *Victorian Studies* 48 (2006): 505–17; Matthew Rubery, 'Journalism' in *The Cambridge Companion to Victorian Culture*, ed. Francis O'Gorman, Cambridge, UK: Cambridge University Press, 2010, pp. 177–94.
 15. See *The London Gazette*, Court for Relief of Insolvent Debtors, 1855, p. 3346, at <http://www.london-gazette.co.uk/issues/21775/pages/3346/page.pdf>, accessed on 11 April 2013.
 16. L. S. Dawson, *Memoirs of Hydrography, including brief biographies of the Principal Officers who have served in H.M. Naval Surveying Service between the years 1750 and 1885*, Part 2: 1830–1885 (Eastbourne: Henry W. Keay [The Imperial Library], 1885), p. 3.

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