1 The Confederate "Navy to Construct"

This is a story about the Pacific, and yet – in the first of many ironies – it begins not in Valparaiso, San Francisco, or Yokohama but on the river Mersey in the first year of the US Civil War. There, shuttling between Liverpool's banks and dockyards, the Confederate "secret agent" James Bulloch enjoyed a sense of well-earned satisfaction about his efforts to acquire a radical sort of newly made navy all his own. Dispatched to Britain in 1861, he had already overseen the conversion and construction of the Confederate cruisers *Florida* and *Alabama* – fast, lightly armed ships built to raid the US merchant marine. Returning to Liverpool in March 1862, he brought with him a wider mandate: to ink contracts for oceangoing armored warships that (he and his superiors hoped) would break the Union blockade. In the summer of 1863, Bulloch celebrated progress on the two 3,000 ton "rams" taking shape at the Laird Brothers Shipyard, fantasizing that after sweeping past the USN's wooden ships they could shell New York or Boston with impunity.[1] Here – in the metropolitan heart of the "Empire of Cotton" – was the nucleus of a newly made Confederate navy: a force built on little or no existing inventory and leveraging technological innovation to upset a numerically superior fleet.[2]

Unluckily (for him), by September 1863 Bulloch's agenda foundered on the question of British neutrality and the Foreign Enlistment Act.[3] The Laird-built cruiser *Alabama* escaped embargo under a fig-leaf cover story about its civilian utility. But unlike the Confederacy's cruisers, the armored warships being fitted out by Bulloch in Liverpool, or the "Scottish Sea Monster" in Glasgow, were unmistakably made for war.[4] Fearing the British government might seize the ships as contraband, Bulloch cut bait and abandoned the projects.

The experience left Bulloch embittered, but his frustrations worked to the advantage of many navy builders. In 1869, an eleven-year-old Theodore Roosevelt visited Liverpool – where Bulloch still lived in exile – taking in the "could-have-been" possibility of the CSN and with it the importance of naval power.[5] It was a lesson he never forgot. Even

earlier, Bulloch's strategy found purchase among other navy builders – especially those in the Pacific World facing similar structural disadvantages. By 1863, agents from Pacific states arrived in Liverpool, working like Bulloch to conjure up newly made navies for defense against North Atlantic pressure. Even in failure, Bulloch and other Confederate leaders had articulated a vision of what a small, relatively unindustrialized state could accomplish through foreign acquisitions and radically innovative technologies. In the coming decades, that same sense of possibility – the chance to compete – spread across the Pacific World's self-strengthening movements as a template for naval power on the cheap. Similarities stemmed from common structural constraints, but as often as not the proliferation of the CSN model was also the result of explicit imitation or the transnational circulation of veterans and/or tactical manuals after 1865. Unlike Bulloch and the CSN, Pacific self-strengtheners achieved lasting results, building small but technically advanced newly made navies – some of which later challenged the USN.

This chapter makes little attempt to break new archival ground on the CSN per se but rather considers the Civil War's relevance to the Pacific by resituating the CSN in an international and comparative (i.e., transwar) context. Intersections with the Pacific World have been underestimated to date by the tendency to see the CSN as a (sub)national question of the US Civil War.[6] A transwar reframing brings into focus the CSN's position as one of many export-dependent economies building navies in the 1860s as a response to the shock of North Atlantic naval power. In this respect, the CSN offered a technical-strategic template – and indeed a practical experiment under the conditions of real war – for maritime self-strengthening against major industrial powers. Geographical and economic factors forced the Confederacy – as much as China or Peru – to turn to experimental technologies. As the technical and tactical legacies of the Civil War proliferated in the Pacific during the 1860s and 1870s, they inspired newly made navies, arms races, wars, and credible threats to the North Atlantic's monopoly on industrial naval violence. A case for the making of *the* US New Navy in response to all this activity was not far behind.

1.1 The Confederate Variant of Self-strengthening

Appreciating the extent to which Confederate tactics, *materiel*, and personnel mattered to the Pacific World requires a shift to a more capacious understanding of the CSN. Most obviously situating the CSN in an international context – much in the way transnational and comparative historians have reframed slavery and the Civil War in

general – reveals parallels to what nineteenth-century Chinese reformers called "self-strengthening": a drive to acquire, build, or adapt industrial technologies to resist North Atlantic imperialism.[7] Because of its geographic and economic position, the Confederacy shared a great deal with other weak, coastal states – most often in the Pacific – pursuing new capabilities. While usually applied to the Qing, the impulse to self-strengthen was widespread. Though it varied according to specific cases, in a general sense self-strengthening appears as a global reaction to industrially backed imperialism.[8] Historians have used self-strengthening as an analytical category for late nineteenth-century China, Japan, Turkey, Egypt, and Ethiopia – but curiously not the Confederacy.[9]

The comparability of the CSN to contemporaneous self-strengthening movements (or newly made navies) has largely been obscured by methodological nationalism and a bias toward the continental history of the Civil War.[10] Owing to the raw scale of the violence on land, military historians usually portray the CSN as a subset of a subnational conflict.[11] Embedding the CSN in a transwar context forces a reexamination of its significance. Far from exceptional, the CSN experimented with a common model of self-strengthening. Because of its ambition and record of tactical (if not strategic) success against the USN, the CSN was not only representative of wider trends but prototypical of later movements that leveraged technological change and recent experience to "catch up." That fact becomes even clearer when CSN operations are contrasted against the Pacific wars and naval races of the 1860s and 1870s.

Two (primary) structural factors encouraged common strategies among Confederate leaders and other self-strengtheners: economic dependency and geographic vulnerability to the sea. Economically, the Confederacy's cotton crop made it similar to other "peripheral" and "semi-peripheral" states organized to extract – most often through coercive labor regimes – commodities such as sugar, guano, copper, cotton, tea, and silk in exchange for manufactured goods from the industrial "core" in the North Atlantic.[12] One result was to limit domestic industrial capacity and create dependency on European factories and yards.[13] As warships became more technically sophisticated, industrial dependency had obvious implications for newly made navy builders in the Confederacy and Pacific world alike. In a telling example of the Confederacy's comparative similarities to other self-strengthening states, Laird Brothers built warships in the 1860s for the CSN, China, Brazil, and Peru – more or less simultaneously.[14]

In the case of the US Civil War, the industrial asymmetry was striking. Even as Southern slaveholders pioneered cutting-edge techniques of capitalist exploitation, the Confederacy's export-driven economy

lacked significant shipbuilding capacity.[15] During the antebellum period, "Southern Navalists" cultivated the federal USN as a force for the protection and expansion of slavery into and across the Americas.[16] But once stripped of this national protection, Confederate leaders faced the prospect of building a navy with little or no existing inventory or infrastructure.[17] Surveying the industrial potential of the Confederacy in 1862, Stephen Mallory, the Secretary of the CSN, enumerated the many ways in which material inferiority impeded the "speedy construction of a navy": The South had few mills, few yards, and fewer still engine-making facilities.[18] Bulloch lamented the challenge of building a navy when "the means for constructing and equipping a naval force for offensive warfare, or even for a vigorous resistance, were practically nil."[19] The Confederate Naval Academy – such that it was – had no campus and made do holding classes onboard the aging CSS *Patrick Henry*, anchored in the James River.[20] In 1862, Mallory summed up the issue by reporting to his superiors, "the United States have a constructed Navy; we have a Navy to construct."[21]

In this respect, the Confederacy resembled a number of states facing the threat of North Atlantic gunboats. Confronting a Spanish squadron in 1865, Chilean Foreign Minister Alvaro Covarrubias noted that Chile would have to "extemporize armies" after being caught unprepared and consequently "almost disarmed and without elements for a naval war."[22] That same year, Jose Manuel Pinto, the Minister of the Chilean Navy, complained that whatever ships Chile had "at present, or which we hope to have, they demand arsenals" without which "there is no service possible."[23] Even states with modern shipyards, such as those established by the Qing reformers Li Hongzhang and Zuo Zongtang in the 1860s, needed time to actually build warships and develop technical proficiency (人才).[24] As ironclad steamships improved in the 1860s, it was relatively easy to recognize naval power, Mallory wrote to the Confederate Committee on Naval Affairs, as "a matter of the first necessity."[25] "Strong ships and power cannons" (船坚炮利), agreed Li Hongzhang in 1867, were clearly an "existential matter."[26] Achieving that end was another story, impeded by material limitations. As the pace of North Atlantic industrialization accelerated, competitors faced a daunting task.

Geographic liabilities were as important as economic constraints. The Confederacy's port cities and coastal communities had to be defended from amphibious pressure. More dangerous still, in the same way that US river networks allowed for slavery's south–north expansion from the Caribbean ("our steamboat imperialism" in the words of the historian Maya Jasanoff), so too did the Confederacy's rivers and ports offer avenues of attack for Union gunboats.[27] USN ships steaming "up the

Yazoo" and other rivers threatened to carve up the Confederacy like a melon – indeed they eventually did.[28] Defending against that vulnerability was a persistent challenge and one the CSN never adequately solved.

Naval strategists in Chile, China, and Japan could (and sometimes did) empathize. In 1866, José Manuel Pinto, wrote that Chile was bound by the Andes to the east and the Atacama to the north, leaving its coast the "only flank to guard" and nowhere to retreat.[29] Li Hongzhang stressed similar vulnerabilities along China's "vast coastline" and river networks.[30] Well into the 1880s, Li could observe to the US naval diplomat Robert Shufeldt that "the geographical positions of the United States and China are fairly similar," owing to their coastlines and river networks, complicating defensive measures.[31] And of course, after the arrival of Perry's Black Ships in 1853, the "extreme vulnerability of Japan to maritime aggression" was self-evident to Tokugawa and Meiji officials.[32] With the benefit of historical perspective, Alfred Thayer Mahan theorized that an extensive coastline and deepwater ports were a useful element of "sea power" but only if defended by appropriate investments.[33] Nineteenth-century self-strengtheners in both the Pacific and the Confederacy had the coastline but scrambled to create newly made navies to match it.

For the CSN (and later imitators), material inferiority and geographical vulnerability were not, though, without their advantages. Given its structural constraints, CSN officers set about seizing the advantages at hand; first and foremost a willingness to innovate with new industrial technologies free of the institutional fetters and path dependencies of the USN.[34] Alongside desperation, that sense of liberation from convention produced a staggering degree of innovation. Mallory argued to Jefferson Davis that because of the Confederacy's inability to compete symmetrically with the Union, its newly made navy should instead focus on acquiring modern (if experimental) industrial weapons, "compensating by their offensive and defensive power for the inequality of numbers."[35] Against the power of Union industrial productivity and numerical advantage, Mallory proposed an asymmetric strategy relying on new and prototypical naval technologies; above all ironclad warships that would render wooden-hulled USN ships obsolete.[36]

Historians have called this a "technology strategy," or strategy of "technical surprise," but it might better be understood in a transwar context as the Confederate variant of self-strengthening: an attempt to seize on paradigmatically innovative technologies – namely ironclads (which could defeat wooden ships) and the torpedo (which could defeat ironclads) – to upset the inherited advantages of a North Atlantic power.[37] It was a form of technical-strategic synthesis, borne of material

inferiority, institutional creativity, and geographic vulnerabilities. Here industrial technology would not just improve the military performance of warships; it was a revolutionary set of wonder weapons that could reshape the course of the war in a strategic sense. Just as the challenges to CSN self-strengtheners were common across Pacific states in the nineteenth century, so too (with variations) did this technical-strategic gamble travel widely. Structural challenges encouraged officials in Charleston, Callao, Valparaiso, and Fuzhou to rely on mirrored naval strategies: namely the foreign acquisition of armored warships and/or the local adaptation of new, asymmetric technologies such as the torpedo. This chapter's following sections explore how this all worked in practice.

1.2 Peru, the Confederacy, and the Liverpool Connection

In 1861, the CSN faced two existential and unenviable tasks. First, given the Confederate States of America's (CSA) export/import-dependent economy, the maintenance of sea lines of communication to Europe was critical.[38] The best means to run, or ideally break, the Union blockade was a constant source of debate and intrigue among Confederate leaders. The second challenge was to defend the Confederacy's coastline and river networks against Union amphibious attacks and penetration. Without a "constructed navy," Confederate naval strategy hinged on three technologies: (1) steam-powered commerce-harassing cruisers such as the *Alabama*; (2) ironclad warships to challenge USN sea control; and finally (3) torpedo-mines and shore batteries to resist Union amphibious attacks.

Locally produced warships such as CSS *Virginia* were the most obvious (and after the fact famous) manifestation of self-strengthening through novel technologies. As navies transitioned from wooden-hulled to armored warships, late adopters had major advantages. In 1862, at Hampton Roads, the CSN seized on exactly this ephemeral advantage, devastating wooden USN ships. But while CSS *Virginia* and its eventual fight with the USN ironclad *Monitor* inspired a great deal of excitement – poems, memorabilia, even *Monitor*-themed cheese boxes – the Confederacy's domestic production of ironclads was never a sustainable strategy for resistance.[39] Without shipyards and foundries, the Confederacy was unable to symmetrically compete with Union shipbuilding on a ton-for-ton basis. The Union had the shipyards to turn out monitors by the dozen; the Confederacy did not. Throughout the course of the war, the CSN managed to bolt together twenty ironclads of various shapes and sizes. The Union, by contrast, purpose built seventy-one

ironclads.[40] In a revealing detail, a squadron of Confederate river defense "Cottonclads" resorted to using compressed bales of cotton for protection in lieu of metal armor.[41] The export-dependent South had lots of cotton; ironworks were another matter.

This limitation encouraged a turn to asymmetric warfare and commerce raiding, enabled by European firms. Leveraging European industrial productivity and political sympathies, CSN agents fanned out across France and Britain to buy the ironclads, cruisers, and gunboats they were unable to build at home. Unsurprisingly, in Liverpool – likely the most pro-Confederate city in Europe – they found shipbuilders and bankers happy to oblige Confederate aims.[42] Just over the river Mersey, the shipyard Laird Brothers first became involved in the US Civil War when it contracted with Bulloch to build the "rebel pirate" *Alabama*: a Confederate commerce-raider that captured or sank sixty-four US merchant ships and provoked a storm of diplomatic correspondence between Washington, London, and Richmond.[43] This program of cruiser warfare had some prospect of strategic success and was long seen as the "most effective" Confederate naval effort.[44] Economic hardship brought about by commerce raiding, the theory went, might force a northern political collapse. At the very least, the USN would have to divert warships to convoy merchant shipping, thereby lessening the effectiveness of the blockade of the Confederate coast.[45]

Like CSS *Virginia*, such dreams amounted to little strategic consequence. While Confederate raiders destroyed large quantities of Union shipping, they never seriously eroded USN sea control or the blockade. As Mahan (who took part in the Union blockade) noted after the war, campaigns of commerce destruction tend to be only marginally effective next to fleet actions. His experience in the Civil War offered a near textbook example. Red tape mattered as well. US diplomats scrutinized foreign shipbuilding in an effort to snuff out would-be *Alabamas* before they could launch. A paperwork war over CSS *Alabama*'s record of destruction endured well after the conclusion of the Civil War, souring Anglo–US relations into the 1870s.[46]

Domestically produced warships (*Virginia*) and maritime raiding (*Alabama*), then, had lackluster effects for the CSN; that left the promise of technological gambles. Laird was again a central player in the Confederacy's most technologically ambitious efforts. Undeterred by *Alabama*'s (Laird vessel No. 290) notoriety, Bulloch returned to Liverpool in 1862 to doubled down on the Confederate technology strategy, ordering Laird vessels No. 294 and No. 295: a pair of ironclad, seagoing "rams," with "shield and patent apparatuses" designed by the British naval architect Cowper Coles (Figure 1.1).[47]

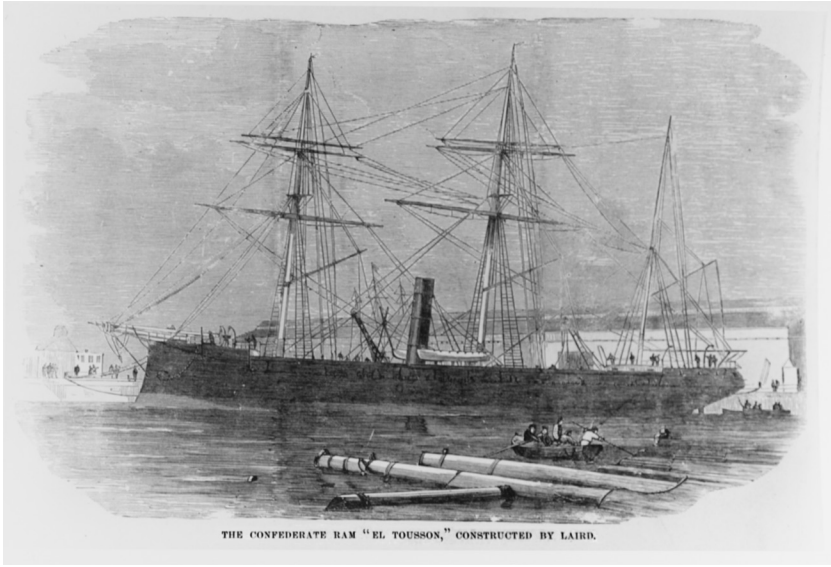

Figure 1.1 Confederate rams
Source: "HMS *Scorpion*," S27/002, WA/UK.[48]

Contracted in July 1862, only months after the Battle of Hampton Roads, these "Laird Rams" were an experiment in naval architecture building on recent technical lessons and the strategic imperatives of the US Civil War.[49] Designated as the "North Carolina" class, the ships were designed to engage directly with the USN, hoping that, as Mallory had advocated, "inequality of numbers may be compensated by invulnerability."[50] Unlike the largely improvisational (if locally effective) CSS *Virginia*, these ships were cutting edge and purpose built to upset USN numerical preponderance. Their blueprints were so novel (and the pressures to obscure their military utility from US officials so intense) that the contracts Laird provided to Bulloch warned they could only "show *generally* the class of vessel and machinery."[51] That same technological ingenuity produced rampant optimism about the rams' potential.[52] Bulloch claimed that in contrast to the *Virginia* – limited by range, endurance, and firepower – the Laird Rams promised "something more than harbor or even coast defense … they could sweep away the entire blockading fleet of the enemy."[53] Raids by Confederates such as Charles Read – a future mercenary in South America's newly made navies – against Portland Maine (1863) highlighting the Union seaboard's vulnerability.[54] Perhaps, as the Confederate historian Thomas

Scharf argued, the rams could even "break the blockade of the Southern ports, and lay some of the Northern cities under ransom."[55] The assistant Secretary of the USN, Gustavus Fox, took the threat seriously and ordered every diplomatic effort be made to prevent their release to the Confederacy.[56]

Unhappily for the CSN, the stipulations of the Foreign Enlistment Act eventually frustrated Bulloch's ambitions.[57] British law prohibited the building and arming of naval vessels for a belligerent state. Bulloch might have skirted the letter of the law with *Alabama*, but the armored Laird Rams were weapons in and of themselves. What civilian purpose could there be for the vessels' titular rams – designed to rip into the hulls of opposing ships – or proprietary gun turrets? After Whitehall prohibited their sale to the Confederacy in 1863, the Royal Navy purchased the rams, recommissioning them as HMS *Scorpion* and HMS *Wivern* in October 1865.[58] For Bulloch and his backers, it was a heavy blow given the financial and emotional investment. Many at the time believed, as the historian Frank Merli later noted, that "September [1863] at Birkenhead no less than July at Gettysburg, doomed the Confederacy."[59] In what should be an inspiration to every staff officer, good paperwork won the USN perhaps its most important victory in the Civil War.

It was not, however, all gloom in Liverpool for would-be navy builders. The Confederate foray into ironclad shipbuilding was a prolog to a steady stream of self-strengtheners looking to acquire modern forms of naval power. In 1863, Laird launched the screw-steamer *Tien Tsin* and the armed paddle steamer *Kwang Tung* for Qing China; part of an ill-fated attempt to buy the ready-made, foreign-built Lay-Osborne Flotilla.[60] In 1865 Laird contracted the *Bahia* and *Lima Baros* for Brazil.[61] And in 1866 Laird delivered the *Huáscar* to Peru: an ironclad monitor for use in the then ongoing conflict between Peru, Chile, and Spain.[62] The Confederate Laird Rams were exceptional because of the diplomatic fury that attended them, but as artifacts of naval power through the applications of new technologies they were representative of a trend on which Laird happily capitalized. In what became a theme in the coming decade, Confederate distress was to the advantage of the Pacific's newly made navies.

Consider the Peruvian ironclad *Huáscar*. Laird completed the vessel in 1866, but its origins belong to the comparative world of the Civil War and the Confederate strategy of self-strengthening through novel technologies: of "fighting with iron against wood."[63] As early as May 1862, Peruvian representatives in the United States had entertained offers from the shipbuilder John Ericsson for "a vessel of war with

revolving turrets on the 'Monitor' system," then used by the USN.[64] The Peruvian agent in New York assumed that this was the "best system yet invented" and had exposed the "comparative inferiority" of CSS *Virginia*.[65] That sale was blocked by questions of neutrality and resource availability but nonetheless reflected an attempt by Peruvian agents to seize on advances from the US Civil War mere weeks after the Battle of Hampton Roads.

The Peruvian drive to acquire an armored warship turned more urgent in 1864, when a Spanish fleet sailed into the Pacific with ominous demands for its former colonies (see Chapter 2). Having been turned away by the United States, Peruvian agents traveled to Liverpool, following the same logic and incentives that motivated Bulloch. Jose Maria Salcedo arrived at Laird's doorstep fast on the heels of his Confederate counterpart.[66] Like Bulloch, he came with an order for small cruising ships but quickly expanded his objectives. What Peru really needed, Salcedo concluded, was an oceangoing armored ram – something state of the art – that would allow Peru to meet the Spanish threat. In an effort to do just that, Salcedo contracted the *Huáscar* in the summer of 1864.[67] Just one year after the launch of the Confederate rams, "vessel No. 321" was built with the benefit of experience gained at the Confederacy's expense (Figure 1.2).[68] Key, iterative improvements included a centrally located, rotating armored turret. Coles, the ship's architect, considered it one of his finest inventions.[69] Cheerleading for its local industrialists, the *Portsmouth Times and Naval Gazette* as well as *Liverpool Albion* approved of *Huáscar* as the world's first proof that an "armour-clad ship … can be built of Captain Cowper Coles' turret principle to combine speed and sea-going qualities of the first order."[70]

During the same period, the British firm Samuda Brothers built the 3,000 ton armored frigate *Independencia* under the supervision of the Peruvian officer Aurelio Garcia y Garcia. This ship, too, benefited from Confederate self-strengthening effort – in its own way. Early in the war, Samuda built a turreted ironclad warship with Coles' technology in a speculative endeavor to attract Confederate buyers.[71] Snarled in red tape, that ship eventually became the Prussian *Arminius*, but it prepared Samuda for similar contracts. For Garcia y Garcia, Samuda's practice appeared to have paid off in the making of *Independencia*. Ordered in 1864, *Independencia*, he contended, represented the apogee of naval construction, featuring innovations such as "a magnificent propeller steam engine" and a "water distillation apparatus that could keep the ship at sea for fifty days at a time." The British engineer Edward J. Reed (a chief rival and critic of Cowper Coles' turreted concept, featured on the *Huáscar*) celebrated *Independencia* as "one of the best ships of its class

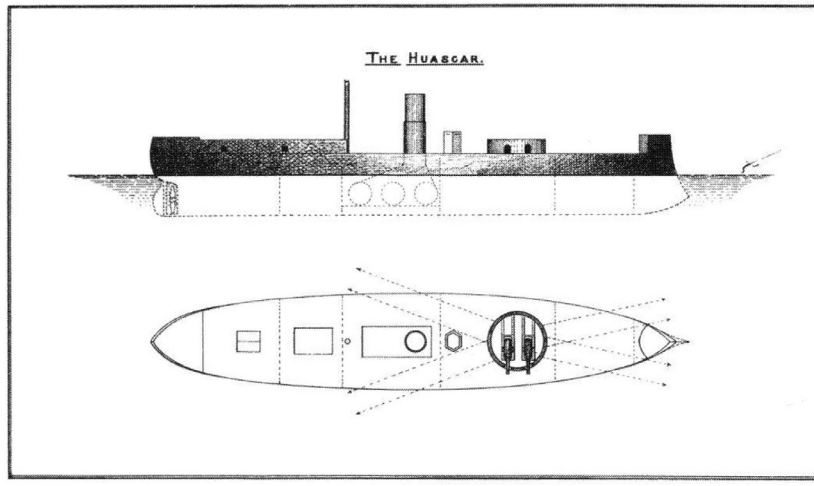

Figure 1.2 "Naval Architecture Sketch of the Peruvian Ironclad Monitor *Huáscar*"
Source: "Peruvian Ironclad Monitor *Huáscar*," James Wilson King, *The War-Ships and Navies of the World* (Boston: A. Williams, 1880).

to leave an English shipyard." Most importantly, Garcia y Garcia wrote in an echo of Mallory and Bulloch that by concentrating "the most offensive and defensive power in one ship," *Independencia* could overcome North Atlantic advantages.[72]

Forecasting the impact of the ironclads on the War against Spain from his hotel in Great Britain, Garcia y Garcia had high hopes. Mirroring Bulloch's aspiration to "sweep away" the Union blockade, Garcia y Garcia reported that the *Huáscar* and *Independencia* were exactly what Peru needed to rid the Pacific of the "declared enemies of America and highwaymen." He argued, furthermore, that if *Huáscar* and *Independencia* were to attack Spanish possessions in the West Indies, Peru would "conquer much glory to our flag."[73] That was less a boast than an ambition to exploit the paradigmatic significance of the moment. It was no more grandiose than Confederate dreams of raiding New York and Boston.

Of course, for Coles and Laird Brothers, both Salcedo and Bulloch's efforts to acquire an ironclad fleet were reciprocally advantageous. For a start, there was money to be made. The *Huáscar*'s turret alone (the most distinctive feature of Coles' design) cost £5,700.[74] More notably, Peruvian (and CSN) demand supplemented lukewarm British interest, offering a practical test of his designs.[75] Coles complained that while the Admiralty had hesitated, "foreign governments … besides private firms

have proved the principle by building new and seaworthy turret vessels" such as the *Huáscar*.[76] Captain Sherard Osborn, RN likewise accused Admiralty officials, in contrast to foreign ones, of providing Coles with nothing but "ignorance and red tape."[77] The Peruvian "navy to construct," like the CSN, could afford no such reticence about innovation.[78] In practice, the experimental *Huáscar*'s "most satisfactory" performance en route to Peru was valuable proof (it seemed) of the design's seaworthiness, then under (rightful) skepticism in Britain.[79] Laird Brothers wrote to the *Times* that it had already built ironclad monitors for Peru and Brazil, so there was nothing holding up the private sector from producing said weapons for the Royal Navy. As it was, the only turreted warships in British hands were the Laird Rams, originally built for the CSN.[80] Foreign experience, from the Confederacy to Peru, had validated the concept; perhaps the Royal Navy would finally take note.

In all, Bulloch's and Mallory's attempts to attain naval power in Liverpool set precedents for a number of self-strengthening states in the Pacific confronting similar economic limitations and geographical vulnerabilities. Even before the conclusion of the Civil War, Confederate machinations mirrored Peruvian ones. By seizing on paradigmatically new technologies, new navy builders hoped to use the rate of naval development to catch up and even surpass established North Atlantic powers. Reciprocally, Confederate demand stimulated experimental technology in Britain and created surplus weapons and capacity for the Pacific World as early as 1864. The implications echoed throughout the 1860s and 1870s.

1.3 The Torpedo as a Campaign of Technological Asymmetry

Sensibly, naval historians like to study ships. As a result, seagoing combatants such as *Alabama* have captured headlines and historiographical attention about Civil War navies to the detriment of other technologies.[81] At the same time as Bulloch fantasized about the strategic implications of his rams in Liverpool, a campaign of comparable innovation bubbled up from the swampy ground along the Confederate coast: torpedo warfare. Cheap, novel, and often crude, the CSN's turn to (semi-) submersible weapons was ultimately a more effective and enduring technical response to USN material superiority than foreign-built ironclads. Reflecting its prototypical nature, the term torpedo covered a confusingly wide range of innovations. Primarily, the weapons came in the form of floating torpedo-mines or spar torpedo boats: small ships with an explosive device attached to their bows via a pole or spar.[82] What the CSN

historian Thomas Scarf called "subaqueous and subterranean infernal machines" promised to level Union naval power by cheaply distributing lethality into new dimensions.[83] Hence the danger that made Farragut's command, "damn the torpedoes, full speed ahead" so remarkable.[84] As the CSA General Matthew Butler noted, "[under] the pressure of dire distress and great necessity, the Rebels turned their attention to torpedoes as a means of defense against such terrible odds."[85] It was a paradigmatic departure in the history of naval war, motivated by desperation and enabled by freedom from legacy investments.

The record of the CSA/N's crash innovation program in undersea warfare was dramatic. Confederate torpedoes first sunk USS *Cairo* on the Yazoo in December 1862 and grew steadily in importance to coastal and river defense.[86] Consider the precedents set during the defense of Charleston, SC (1861–1865) alone. It was there that William T. Glassell and James. H. Tomb built the semi-submersible craft CSS *David* and used its spar torpedo to attack an enemy combatant (the "much dreaded naval Goliath" USS *New Ironsides*).[87] Ordered out by John R. Tucker "with a view of destroying as many of the enemy's vessels as possible," Glassell and Tomb managed to detonate a torpedo against USS *New Ironsides*' hull.[88] It was hailed as a success, no matter that in doing so the Confederates capsized their boat leaving Glassell in enemy hands – hoisted, rather literally, by his own petard. Charleston also saw the first modification of ironclads with spar torpedoes for offensive war – an attempt to amalgamate two paradigmatic technologies in one.[89] Incredibly, the CSN even deployed the world's first metal-hull submarines. These had a distressing habit of sinking.[90] The most famous of the bunch, CSS *Hunley*, struck and sunk USS *Housatonic* with a spar torpedo but foundered before its return to port – a pathetic but predictable result after a dismal run of tests.[91] Inspired by Charleston's example, the Confederate innovator Hunter Davidson built a network of electrically fired submarine mines to defend the James River, still another precedent in the history of warfare.[92]

Adaptations such as these were not merely the product of pluck or quixotic optimism. Rather, the CSN's use of submersible mines and spar torpedoes to deny the Union access to ports and river networks represented the world's first campaign of industrial, asymmetric naval warfare in three-dimensional and nocturnal space. CSN officers and engineers sought to apply advances in industrial technology to upset the Union's investment in conventional platforms – and did so with some success.[93] During the war, torpedoes sank or disabled more Union ships than any other weapon.[94] Were it not for Sherman's overland army, Charleston's coastal defenses may have resisted indefinitely.[95] The point was one of

great pride to the Confederate self-strengtheners – and a proportionate embarrassment for the USN. Mallory believed that "nothing in the history of naval warfare so humiliating to a proud people" as the Union's inability to take Charleston by sea.[96] It was a remarkable step driven not by generous research budgets or careful staff planning but the articulations of "great necessity" with the opportunities created by paradigmatic shifts in industrial technology.[97]

From Washington to Beijing, many took note. The Union commander at Charleston, John A. Dahlgren – a critical figure himself in the history of USN development, known as the "founding father of naval ordnance" – was so impressed by the CSN's torpedo program that he proposed imitating it.[98] After blockade ships captured the crew of the foundering *David*, he forwarded a sketch to the Navy Department outlining the CSS *David* as a model for the United States. "The torpedo element as a means of certain warfare," Dahlgren admitted, "can be ignored no longer." The torpedo boat was a weapon of the weak but one the United States should mass-produce with its industrial establishment. "By all means," Dahlgren urged, "let us have a quantity of these torpedoes, and thus turn them against the enemy. We can make them faster than they can."[99] Not long after, an intrepid group of USN officers and engineers did exactly that, using a spar torpedo boat to destroy an upriver Confederate ironclad.[100]

Whatever its operational and tactical import, the torpedo could only do so much to affect the war's outcome. But thinking beyond the conventional boundaries of the war suggests a global significance. The CSN/A failed in its bid for independence, but its effort at asymmetric self-strengthening produced the crude outlines of modern, three-dimensional naval war which would feature prominently in nineteenth-century naval races and beyond.[101] James Hamilton Tomb – the CSN torpedo engineer onboard the *David* – recognized as much. In 1916, as World War I's U-boat campaign reached its nadir, he and a colleague marveled that their primitive experiments at Charleston were "the real start in the present development" of submarine war.[102]

More immediately, Pacific states in comparable economic and geographic predicaments took note of the Confederate experience and its possibilities. Foreign acquisitions of experimental *materiel* and local adaptation of asymmetric technologies made for a potent combination – one with the potential to upend the dynamic of North Atlantic gunboat imperialism. With the torpedo's potential in mind, Vicuña Mackenna offered command of the allied Peruvian–Chilean squadron to a very junior W. T. Glassell, stressing his "heroic action" piloting a torpedo boat against USS *New Ironsides*; proof positive of the torpedo's

"extraordinary results" in the minds of one Pacific self-strengthener.[103] Likewise, Chinese officials touring Boston in 1868 could look out over a fleet of decommissioned USN monitors and take away the need to invest in torpedoes as a means of stopping up rivers against foreign warships.[104] The Confederate "navy to construct" responded to the particular exigencies of the Civil War (a blockade and the threat of riverine penetration), but the threat of North Atlantic naval power as well as economic and geographic vulnerability were common in the Pacific. As it turned out, the solution – self-strengthening through the acquisition of advanced hardware and adaptation of local technologies for coastal defense – was common as well.

1.4 The Civil War on the Edge of the US Empire

Beyond revealing a suite of technological options, the Civil War demonstrated something else about the Pacific to regional self-strengtheners: the strategic opportunities and vulnerabilities of its raw separation from the North Atlantic.[105] That was true, in particular, for the US citizens huddled along the Pacific slope and largely denuded of USN presence by the existential struggle in the Atlantic. From the Mexican American War to the opening of the Panama Canal, US residents on the California coast expressed a chronic sense of separation; a sentiment that spiked acutely during the Civil War. In 1847, Kit Carson attempted a speed record when he crossed overland from California to Washington, DC in sixty days by mule – the most convenient means available, unless you asked the mules.[106] A decade later, passengers had to brave a bone-rattling trip by stagecoach across West Texas, New Mexico, and Arizona. During the Civil War, Confederate raids severed what rudimentary roadways connected California to Texas.[107] French intervention in Mexico further attenuated matters.[108] By sea, the route of many gold-seeking "49ers" through "the dread malaria of the tropics" remained time-consuming and expensive – though not so much as the weeks-long journey around the horn of South America.[109] It was a long, hard way, but at least San Francisco's preferred whiskey, Cyrus Noble, benefited from almost a year of barrel aging en route by ship from its distillery in Ohio.[110] Attempts to knit together, or "territorialize," the United States with railroads and telegraphy in the 1850s and 1860s did little to alleviate the immediate sense of alienation. While funded during the Civil War, the transcontinental railroad was not completed until after Appomattox – and even then it was more a technical achievement than means of transportation.[111] Jules Verne's

1872 *Around the World in Eighty Days* still imagined the transcontinental train journey interrupted by failing bridges and raids by plains Indians.[112] As a result of distance and violence, Civil War-era Anglo-Californians felt more divided than connected by the American continent, making California an overseas colony in all but name.

For these "overseas" Californians, it was distressingly unclear if the United States had the ability to protect its maritime appendage in the Pacific World. The US Navy Yard at Mare Island was never well supplied in the best of times. Demand for resources by the war in the Atlantic made things worse. In 1863, Rear Admiral Bell, commanding the Pacific Squadron, expressed ambivalence about his capacity to defend sea routes to Panama from Confederate privateers leaking out from South or Central America.[113] A year later, stretching to protect US citizens and interests from Mexico to Peru, Bell pleaded with the Navy Department to station *one* cruiser in San Francisco to pursue suspicious vessels.[114]

The Confederate cruiser CSS *Shenandoah* realized Bell's fears in the last year of the war when it began a months-long attack on US commercial interests in the northern Pacific. Its commander, James Waddell, ran the Union blockade to Britain in August 1863, placing himself at Bulloch's disposal just as the Laird Rams came to grief.[115] Taking command of the *Shenandoah* in October 1864, he accepted orders for "the far-distant Pacific" to raid the US whaling fleet.[116] When CSS *Shenandoah* reached the Pacific in 1865, Waddell found no serious opposition and began his depredations. A "cowardly, mercenary and utterly perfidious system of warfare," CSS *Shenandoah* was, the *Sacramento Daily Union* stewed, of "of special interest to California."[117] Frustrated news reports swirled that *Shenandoah* was on the prowl, threatening "terrible havoc" among US ships from the Arctic Circle to New Zealand.[118] Waddell's ambitions were more modest, but he did his worst burning ships and whale oil. Beyond this, Californian newspapers worried he would fit out captured vessels as privateers and "sail for the American coast" in an effort to strike at Californian shipping.[119] As a maritime satellite of the continental United States, Californians were keenly alive to such threats. Out of contact with his superiors, Waddell's war in the Pacific actually continued for months after the official conclusion of hostilities. Distrusting news of Lee's surrender at Appomattox from Yankee whalers, he continued apace until August, 1865.[120] New Bedford ship-owners and San Francisco wharf masters predicted the unaccountable Waddell would "soon destroy the whole Arctic fleet."[121] USN officials noted "great apprehensions felt by the mercantile community of San Francisco" – but who could blame them?[122]

As for the USN, whatever its success in the Atlantic, it was ill-prepared for the Pacific and its demands. CSS *Shenandoah* was only lightly armed, certainly relative to the entire Pacific Squadron, but it was fast and would demand resources to catch. Everyone could remember how, the *Sacramento Daily Union* noted, "quite a formidable squadron of our gunboats vainly … pursued the *Alabama*."[123] No such force was available in the Pacific. As of May 1865, the commander of the Pacific Squadron would lamely report that his flagship, USS *Lancaster*, had nonfunctioning boilers and had been reduced to sail power.[124] So much for industrialization. Secretary of the Navy Gideon Welles fumed, threatening to charter a civilian vessel and arm it in order to pursue the last Confederate warship afloat.[125] "Whereabouts of Uncle Sam's Navy – What is to be Done!" read headlines from San Francisco to Honolulu.[126] Others papers transmitted taunts from Waddell – "give the [US] naval officers my compliments" – which must have stung.[127] The handful of USN vessels that eventually did sortie after *Shenandoah* failed to locate it. Fortunately for all involved, on August 2, 1865, a British ship captain crossed paths with Waddell and managed to convince him that the war was *really* over.[128] Waddell turned – naturally – for pro-Confederate Liverpool, where he expected a hero's reception.

It was a ragged end to the Civil War on the far and isolated edge of the US Empire. Waddell had confined himself to raiding at sea, but left unchecked he also threatened to attack Pacific ports. California had its own (recent) tradition of maritime vulnerability. In the 1840s, the USN Pacific Squadron seized then Mexican Monterey in Alta California – *twice*: once by mistake in 1842, when Commodore Catesby Jones dashed up from Lima under the false impression that British forces might occupy California,[129] and again in 1846, this time in deadly earnest, as part of the wider Mexican American War.[130] As Waddell cruised the North Pacific, older residents of Monterey could recall the raid of Hippolyte Bouchard – an French-born, Argentine captain – whose forces occupied the city in 1818 for the better part of a week.[131] In one generation the capital of California had been attacked from the sea three times. What guarantee did the people of San Francisco have that something similar would not befall the California coast in the 1860s? Technological change coupled with geographic distance made the Pacific alive with ephemeral asymmetries of power.

Such worries, fortunately, remained unrealized. Waddell surrendered it to British authorities on the river Mersey six months after Appomattox.[132] As CSS *Shenandoah* crept up the river excited crowds peered through fog to catch a glimpse of the "last of the Anglo-rebel pirates."[133] Waddell hauled down the flag not so far from where *Alabama* and the Laird Rams

had put to sea earlier in the war. Liverpool was an origin point of the Confederate naval self-strengthening effort and the site of its last stand. Waddell understood the moment. Among his achievements he counted the fact that the "last gun in defense of the South was fired from her deck" in June 1865.[134] The Civil War at sea – while fought primarily in the Atlantic and on the rivers of North America – ended in the Pacific.

The war's many afterlives began there as well. A month before Waddell surrendered, the Laird-built *Huáscar* launched into the Mersey. The Peruvian agent overseeing construction could admire the last of Confederate raiders, even as he followed the Confederate self-strengthening template, building ironclads and impatiently making preparation for a looming war with Spain. The CSN had mostly remained a "navy to construct," but other self-strengtheners managed to build their own newly made navies on the foundation of similar technical-strategic foundations. The Pacific's wars and newly made navies would provide ample tests of the Confederate Navy's dreams. Indeed, as CSS *Shenandoah* surrendered, new competitions were already underway across the Pacific World that would soon be accelerated by a wave of Civil War *materiel* and knowledge flowing out to the region.

1.5 Conclusion

Confederate self-strengtheners started the Civil War with a basic challenge: How to mobilize a plantation society and economy to build an industrial navy? They shared this problem with a number of agricultural and pre-industrial economies contemporaneously facing the threat of North Atlantic gunboats. The CSN's solution was to extemporize a form of newly made navy that relied on prototypical innovations and local adaptation, thereby compensating for numerical inferiority with technological sophistication (or at least ingenuity). Bulloch came to Liverpool to contract cruisers but soon moved on to ironclad rams that might sweep the USN from the sea and shell the East Coast into surrender. Bulloch's optimism seems incredible in hindsight, but new technologies have a way of encouraging vaulting ambitions; witness twentieth-century airpower theorists who believed strategic bombing could independently win wars. Locally, innovators such as William Glassell built torpedo weapons in the harbors of the Confederacy – using an asymmetric technology to disrupt the USN.

Self-strengtheners from Chile to China noticed all this progress. Because their own "navies to construct" shared so many foundational similarities with the Confederacy's predicament, the CSN's tactics and strategies offered a possible model as well. After 1865, CSN personnel,

their expertise, and even equipment were in high demand as Pacific self-strengthening movements seized on innovations from the Civil War. One result, the US Civil War's losers nevertheless gained a valuable prize in the form of demand for services that would endure into the 1880s. Reciprocally, the transnational circulation of Civil War expertise and material in the Pacific accelerated self-strengthening programs from Peru to China in the 1860s and 1870s, shaping the newly made navies and the origins of regional wars. For veterans, shipyards, and inventors, the Pacific's newly made navies provided a second and often more ambitious act for the Confederate strategy of naval resistance. Those afterlives are the subject of Chapter 2, and they may well have greater significance for the history of the USN than the Civil War at sea between 1861 and 1865.