Kevin J. Foster. *THE SEARCH FOR SPEED UNDER STEAM: THE DESIGN OF BLOCKADE RUNNING STEAMSHIPS, 1861-1865.* (Under the direction of William N. Still, Jr.) Department of History, June 1991.

The purpose of this thesis is to present a survey of the development of steamships to run the Union blockade of Confederate seaports during the War of Secession.

The first vessels to run the blockade were ordinary traders of all types. As the war progressed and the blockade became more effective, vessels and tactics were modified to improve the chances of a successful "run" through the blockade. Unsuitable ships were weeded out and new vessels were ordered from foreign shipyards.

The Confederacy needed supplies from abroad desperately; British and French mill owners soon needed Southern cotton just as much. Huge profits awaited those bold enough and successful enough to carry cargoes through the blockade.

Ships specially constructed for blockade running introduced many new innovations to shipbuilding. Many runners were built of steel, a new material for large structures. They were driven by specialized powerplants with huge boilers and powerful engines. Some were propelled by independent twin-screw propellers, introduced first in a blockade runner. They were designed to carry the maximum cargo in a small space.

Stealth, secrecy, and deception became part and parcel of shipbuilding and operation. Ships were made as nearly invisible as possible. Their names, appearance, and official papers were changed frequently. Everything possible was done to make blockade runners difficult to catch.

Shipowners and operators ordered entire fleets of blockade running vessels from the shipyards of Great Britain. Many of the most progressive shipyards of the Clyde, the Mersey and the Thames Rivers built blockade runners. Some of the most capable scientists and engineers in Great Britain turned their thoughts to achieving the ultimate in speed and invisibility for ships. The shipbuilders of Great Britain succeeded in creating the fastest ships that the world had yet seen.

PHANTOMS, BANSHEES, WILL-OF-THE-WISPS AND THE DARE

OR

THE SEARCH FOR SPEED UNDER STEAM:

THE DESIGN OF BLOCKADE RUNNING STEAMSHIPS

A Thesis

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Introduction

The focus of this study is on marine technology and how it evolved to meet the challenges of the Union blockade of Confederate seaports. The choices made in the employment, design, and construction of the ships illustrate the evolution of the thought and practice of blockade running.

The Civil War saw the widespread introduction of steam propulsion to vessels engaged in illicit trade for the first time in history. Steel hulls, superheated steam, twin-screw propulsion, and other engineering advances were allied with early stealth features to produce very sophisticated, hard-to-catch ships. High technology was allied with age-old methods of blockade running and smuggling.

As this is a design history of a group of ships, only a general overview of the blockade running trade during the Civil War is presented here. No contemporary writer assembled a comprehensive technological or design history of the ships involved in blockade running. This work has been based on surviving contracts, plans, scale models, fragmentary descriptions in engineering magazines, and a few descriptions of the ships at work and after capture.

The best contemporary accounts of blockade running are those of Thomas Taylor, William Watson, James Sprunt, and John Wilkinson. All four men served on blockade runners; Watson and Wilkinson as captains, Taylor as supercargo, and

Sprunt as pilot. These works are most useful as operational accounts, interspersed with anecdotes and droll stories.[1]

The wrecks of a small number of blockade runners have been studied by archaeologists, but little has been published of their efforts. The ongoing research of Gordon Watts, of East Carolina University, and the Underwater Archaeology Branch of the North Carolina Division of Archives and History will provide technical information on blockade runners directly from their remains.

The most complete history of blockade running is Lifeline of the Confederacy: Blockade Running During the Civil War, by Dr. Stephen Wise.[2] Wise looks primarily at the companies and administration of the blockade running trade. Dr. Frank E. Vandiver edited Confederate Blockade Running Through Bermuda, Letters and Cargo Manifests, a discussion of cargoes and Confederate administration of the

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[1] The book-length contemporary accounts of blockade running are: Thomas Taylor, Running the Blockade, 3rd ed. (London: John Murray, 1887); and William Watson, Adventures of a Blockade Runner, (London: T. Fisher Unwin, 1892); and John Wilkinson, The Narrative of a Blockade Runner, (Alexandria, Virginia: Time Life Books, 1984, facsimile reprint of 1st ed. New York: Sheldon & Company, 1877); and James Sprunt, Tales of the Cape Fear Blockade, ed. by Cornelius M. D. Thomas, (Wilmington, North Carolina: Clarendon Imprint, 1960); and Derelicts, (Wilmington, North Carolina: 1920).

[2] Stephen R. Wise, Lifeline of the Confederacy: Blockade Running During the Civil War, (Columbia: University of South Carolina Press, 1988).

trade.[3] The studies by Wise and Vandiver are the only thorough, lengthy studies to seriously address the subject.

The "adventures" connected with the trade comprise the majority of modern treatments. Books such as Blockade Runners of the Confederacy by Hamilton Cochran, The Blockade Runners by Dave Horner, and Blockade by Robert Carse, retell the stories of first-person accounts with little analysis or attention to details of the technology employed.[4] Factors other than technology in the success or failure of blockade runners, such as the effectiveness of various companies or tactics, have been treated in other works and are only considered in passing here.

The efficiency of the blockade is also only treated here in passing. Civil War historians are divided on the question of the efficiency of the Union Navy in preventing prohibited trade. As will be seen here, well-designed, competently handled, blockade running vessels were not easily captured. A full statistical study comparing records of imported goods with Southern manufactured products, captured material, and evidence of trade with the enemy is needed to assess the efficiency of the blockade properly.

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[3] Frank E. Vandiver, Confederate Blockade Running Through Bermuda, 1861-1865. (New York: Kraus Reprint Co., 1970, reprint of Austin: University of Texas Press, 1947).

[4] Hamilton Cochran, Blockade Runners of the Confederacy, (Indianapolis: The Bobbs-Merrill Company, Inc. 1958); Dave Horner, The Blockade Runners: True Tales of Running the Yankee Blockade of the Confederate Coast, (New York: Dodd, Mead & Company, 1968); Robert Carse, Blockade: The Civil War at Sea, (New York: Rinehart & Company, 1958).

Various chapters of this work describe the blockade; the requirements of the blockade running trade, regular and extraordinary; the types of vessels employed as blockade runners; the foreign ships specially built to run the blockade; the shipbuilders who built the runners; and the lasting effects of blockade runner design on the progress of naval architecture and marine engineering.

Chapter I: THE BEGINNING OF BLOCKADE RUNNING

The Law of Blockade

Blockade is the use of a naval force to close the ports of an enemy nation from intercourse with others. Blockades, in the modern sense, have existed since the sixteenth century. In 1562, and again between 1572 and 1581, while at war with Russia, Sweden proclaimed a ban on all commerce with enemy ports. Swedish warships captured enemy trading ships and gently turned away trading vessels of neutral countries. The Dutch and Swedes refined the law governing blockades and the rights of neutrals over the next century. By the mid-seventeenth century the law of blockade became standard among European nations.[1]

During the eighteenth century, Great Britain very effectively maintained several blockades using superior seapower to limit imports to Continental enemies. Each succeeding war brought further refinements. Neutral rights regarding trade in time of war were refined during the Anglo-Dutch War of 1778-82, when the Netherlands went to war with England to protect their right to trade with the blockaded French. The extensive use of blockades during the Napoleonic Wars and

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[1] Sally V. Mallison, and W. Thomas Mallison, "International Law and Naval History: Change and Continuity in the Juridicial Doctrines of Naval Blockade," in Richard A. Von Doenhoff, ed., Versatile Guardian: Research in Naval History, Papers and Procedings of the National Archives Conference on Naval History, National Archives Conferences, vol. 14. (Washington, D.C.: Howard University Press, 1979), pp. 53-70; Phillip C. Jessup and Francis Deak, Neutrality: Its History, Economics and Law, The Origins, vol. I of IV (New York: Octagon Books, n.d.), pp. XI-XIV, 105-123.

the War of 1812 heavily influenced the law of blockade and the rights of neutrals in the late 1850s.[2]

The Law of Blockade and other related international law regarding trade and warfare at sea were summed up by the Declaration of Paris of 1856. Representatives from the principal maritime nations defined the basis of belligerent and neutral rights in war at sea. The four basic ideas of the Declaration were: neutral flags cover enemy goods, except for contraband of war; neutral goods under an enemy flag are not liable to capture; blockades, in order to be binding, must be effective; blockades must be maintained by a force sufficient to prevent access to the coast of the enemy; and "privateering is and remains abolished." The Declaration of Paris was signed by Great Britain, Austria, France, Prussia, Russia, Sardinia, and Turkey. Two nations with large merchant fleets and inadequate navies objected to the abolition of privateering. Only the United States and Spain, among the principal maritime nations, declined to sign. Within three years the American government would pay the penalty for refusing to sign the Declaration.[3]

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[2] Jessup and Deak, Neutrality: The Origins, pp. XI-XIV, 105-123, and passim; W. Alison Phillips and Arthur H. Reede, Neutrality, Its History, Economics and Law: The Napoleonic Period, vol. 2 of 4 (New York: Octagon Books, 1976), pp. 3-26; David Syrett, Neutral Rights and the War in the Narrow Seas 1778-1782 (Fort Leavenworth, Kansas: Combat Studies Institute, U.S. Army Command and General Staff College, n.d., [1985]), passim.

[3] William Beach Lawrence, Visitation and Search; or An Historical Sketch of the British Claim To Exercise a Maritime Police Over The Vessels of All Nations (Boston: Little, Brown And Company, 1858), pp. 4-7; John S.C. Abbott, The History of the Civil War In America; Comprising a Full and Impartial Account of the Origin and Progress

Secession and Blockades

In late 1860 and early 1861, seven states seceded from the United States, seized certain federal government properties, and formed a new national government, the Confederate States of America. Several of the seceded Southern states created their own navies. These navies were later absorbed into the Confederate States Navy.

Both the Union and the Confederacy stalled for time while deciding their courses of action. When the Southern states decided to act in concert, one of the first actions was to call for private citizens to fit out privateers to cruise against Northern commerce. The new Confederate president, Jefferson Davis, announced the availability of privateering letters-of-marque and reprisal on April 17, 1861, only three days after the surrender of Fort Sumter. The formation of a national navy followed the call for privateers.[4]

President Lincoln took office on March 4, 1861; the next month he responded to the Southern maritime threat by applying naval force in the form of a blockade. Lincoln proclaimed a blockade of South Carolina, Georgia, Alabama, Florida,

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of the Rebellion, of the Various Naval and Military Engagements, vol. 1 (Springfield, Massachusetts: Gurdon Bill, 1863), pp. 297-299.

[4] Jefferson Davis in James D. Richardson, Compilation of the Messages and Papers of the Confederacy, vol. 1 (Nashville: United States Publishing Company, 1906), pp. 60-62; and William Morrison Robinson, The Confederate Privateers (New Haven, Connecticut: Yale University Press, 1928), p. 1, 13; and Abbott, History of the Civil War, pp. 298-302.

Mississippi, Louisiana, and Texas, on April 19, 1861. Eight days later, the states of North Carolina and Virginia were added to the blockaded territory, although North Carolina had not yet seceded.[5]

Southern businessmen responded to the Confederate government's call for privateers with alacrity. Within a few days of the announcement, requests for official papers authorizing private citizens to fit out vessels of war, called letters-of-marque, reached the Confederate capital. The first privateer, the schooner Triton, was commissioned at Brunswick, Georgia, on May 10, 1861.[6]

Under orders from the president, the United States Navy also hastened to apply power at sea. Following the Proclamation of Blockade, all available naval vessels were readied for duty; additional vessels were ordered from naval and private shipyards; merchant steamers were bought and chartered to enforce the blockade. The first Southern port to be blockaded was Norfolk, Virginia, on April 30. By the end of July the proclamation of blockade had been posted at all major American ports south of Chesapeake Bay. As ships became available to the navy they were

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[5] The progress of secession in the individual states is from Emory M. Thomas, The Confederate Nation: 1861-1865 (New York: Harper & Row, Publishers, 1979), pp. 67-97; see Appendix I for complete text of the Proclamations of Blockade of April 19, and April 27, 1861. For an account of the reasons for blockade versus port closings see: Norman Ferris, Desperate Diplomacy: William H. Seward's Foreign Policy, 1861 (Knoxville: University of Tennessee Press, 1976), particularly pp. 85-90.

[6] Although much precious energy and capital was expended in their outfitting, privateers appeared more threatening than a real danger. Robinson, The Confederate Privateers, pp. 25-32.

dispatched to blockading stations off the Southern coast. Smaller, less significant ports were closed last.[7]

President Lincoln and Secretary of State William H. Seward chose to style their actions a *blockade* rather than a *closing* of Southern ports. Under accepted international law, a country closed its own ports to quell an insurrection; a blockade could only be made of the ports of an independant, sovereign nation. Thus because of decision to call their actions a blockade, foreign governments recognized the "state of belligerency" existing between the United States and the Confederate States. Recognition of the Confederate States as a nation would follow if they could prevail in the struggle. Thereby, according to the interpretation of the French and British governments, private citizens of foreign countries could legally trade with the South, if they could safely pass the blockade.[8]

The Geography

Naval operations had to adapt to the peculiarities of the Southern coast. The blockaded coastline of the South was 3,549 miles long. Much of the coast was made up of sand dunes protected offshore by a complex interwoven string of barrier islands

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[7] Wise, Lifeline of the Confederacy, pp. 13, 25.

[8] J. Thomas Scharf, History of the Confederate States Navy from Its Organization to the Surrender of Its Last Vessel (n.p.: Fairfax Press, 1977), pp. 428-433; Ferris, Desperate Diplomacy, pp. 33-54, 85-90; Frank J. Merli, Great Britain and the Confederate Navy, 1861-1865 (Bloomington: Indiana University Press, 1970), pp. 40-42.

and shoals. Channels between and behind the barrier islands allowed access to seaports. The sounds, bayous, rivers, and inlets added about another two thousand miles of shoreline to be guarded. Shifting constantly due to storms, changes in river output, and complex coastwise currents, the coastline required experienced, ever-vigilant ship captains and pilots.[9]

Most Southern ports were not as developed as their Northern counterparts. The shallow, difficult coastline discouraged extensive development. Southern ports received finished goods and exported raw materials from local areas to support their economy. Most ports only served local regions. The South lacked sufficient secondary transportation systems to collect and distribute goods arriving at seaports. Canal transportation systems were limited and few. The Southern railroad system was incomplete and generally built of incompatible track gauges.

The South relied heavily on rivers for distribution of goods. The river steamboat system was the most important transportation system in the South. In spite of the hazardous nature of steamboat transportation, and its disadvantages compared to canals and railroads, steamboats were still the dominant transportation system in the South in 1860. Periods of low water paralyzed regional economies. Since the mid-1830s, the steamboat system on Southern rivers had come to be vital to the economic

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[9] Report of the Secretary of the Navy (Washington, D.C.: Government Printing Office, 1863), p. III; and "The Blockade," Report of the Secretary of the Navy (Washington, D.C.: Government Printing Office, 1864), p. v.

health of the region. Cities on the coast and on the fall line had grown faster and developed more fully than other cities largely thanks to steamboats.[10]

Seacoast port cities needed more than efficient transportation systems to grow. The quality and capabilities of the banking and trading houses were also important to trade. *Few Southern ports were well-equipped for international trade. Merchants had* little such experience and capital was distributed in directions away from the sea. Much of the South had little interest or experience in deep water maritime matters. Most of the few cities that were exceptions to this categorization were lost to the Confederacy early in the war.[11]

One Southern port was the grand exception to the rule. In 1860 New Orleans was second only to New York in tonnage shipped through an American port. It was the terminal point to the vast Western Rivers transportation network. More than half of the cotton produced in the United States was exported through New Orleans. Most goods traveling to the center portion of the country passed through New Orleans on

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[10] Archer B. Hulbert, The Paths of Inland Commerce: A Chronicle of Trail, Road, and Waterway (New Haven, Connecticut: Yale University Press, 1920), pp. 174-187; and Leland D. Baldwin, The Keelboat Age on Western Waters (Pittsburgh, Pennsylvania: University of Pittsburgh Press, 1980), pp. 44-46; John H. Morrison, History of American Steam Navigation (New York: Stephen Daye Press, 1958), pp. 207-209; Alan L. Bates, The Western Rivers Steamboat Cyclopoedium (Leonia, New Jersey: Hustle Press, 1968), passim.

[11] David Budlong Tyler, Steam Conquers the Atlantic (New York: D. Appleton-Century Company, 1939), pp. 215-230, 293-309; Richard I. Lester, Confederate Finance and Purchasing in Great Britain (Charlottesville: University Press of Virginia, 1975), pp. 3-4; Wise, Lifeline of the Confederacy, pp. 10-12, and passim.

their way upriver. Other Gulf of Mexico ports were, in descending order of importance, Mobile, Alabama; Pensacola, Florida; and Galveston, Texas. As the war progressed other smaller ports were developed at St. Marks and Tampa, Florida.[12]

Brownsville, Texas, also developed during the war as a major supply entry point to the Confederacy. Located across the Rio Grande from Matamoras, Mexico, Brownsville received and dispatched goods through neutral Mexico. This system usually protected ships carrying these supplies from capture as technically they never violated the blockade. The loophole that allowed trade with Matamoras was used by several Confederate and British blockade running companies as well as a few illicit Union traders.[13]

The two largest Southern ports on the Atlantic were not of any use to the Confederacy for blockade running. Baltimore, Maryland, was never openly allowed to serve the Confederacy, and Norfolk, Virginia, was lost before blockade running was well started. Only two large ports on the Atlantic were of immediate use.

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[12] Report on the Commerce and Navigation of the United States (Washington, D.C.: Government Printing Office, 1861), pp. 310-402, 526-527, 564-584; also compiled in Robert Greenhalgh Albion, The Rise of New York Port [1815-1860] (New York: Charles Scribner's Sons, 1970), pp. 399-400; see John Hebron Moore, The Emergence of the Cotton Kingdom in the Old Southwest, Mississippi, 1770-1860 (Baton Rouge: Louisiana State University Press, 1988), pp. 285-286.

[13] Stuart L. Bernath, Squall Across the Atlantic: American Civil War Prize Cases and Diplomacy (Berkeley: University of California Press), pp. 34-84, 166-168; James W. Daddysman, The Matamoras Trade (Newark: University of Delaware Press, 1984), pp. 151-178; Clement Eaton, A History of the Southern Confederacy (New York: Collier Books, 1961), pp. 145-146.

Charleston, South Carolina, and Savannah, Georgia, had medium depth harbor entrances; were experienced in foreign trade; and had the railroad connections, banking houses, and trading firms required by a large trading port.[14]

Other ports on the Atlantic Coast that played a minor role in blockade running were St. Augustine, Indian River, St. Marks, and Apalachicola, Florida; St. Marys, Georgia; and Georgetown, South Carolina. Port Royal, South Carolina, and the North Carolina sounds were captured early in the war and served as bases for the suppression, rather than the promotion of blockade running. The minor port of Wilmington, North Carolina, grew to major importance to the Confederacy during the war. Wilmington began the war with all of the needed infrastructure for blockade running, and by 1863 the city's merchants developed expertise to use it effectively.[15]

The Blockade Is Established

The Federal strategy was enunciated early in the war. The Southern coastline would be blockaded; interior rivers and water transport used to support Army movements; and Southern rivers used to divide the Confederacy. Naval planners realized that the only sure way of closing Confederate ports was to capture and hold

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[14] Wise, Lifeline of the Confederacy, passim; Daniel Ammen, The Navy in the Civil War: The Atlantic Coast (New York: Charles Scribner's Sons, 1883), p. 215.

[15] Much of this geographic description and economic description of the Southern coastline is derived from Willard Bascom, Waves and Beaches: The Dynamics of the Ocean Surface, Revised and Updated (Garden City, New Jersey: Anchor Press/Doubleday, 1980), passim; Wise, Lifeline of the Confederacy, pp. 7-29.

them. Aggressive naval and amphibious operations early in the war secured operating bases on the Southern coastline, breaking the coast into smaller and smaller areas. Purely naval operations captured Southern deep-water ports; combined amphibious operations captured the shallow-water ports, when the Army was persuaded to cooperate.[16]

The U.S. Navy began the war with ninety vessels on the rolls, but only forty-six were in commission. By December 1863 the Navy swelled to 588 vessels; in December 1864 that number had increased to 671. None of the commissioned vessels in the Union Navy were traditional ships-of-the-line, designed to face the most powerful enemy vessels; the U.S Navy had no need of capital ships for the war did not require them.[17]

The Federal blockade of the Confederacy was structured in response to the challenges of organized blockade running. By 1863, three lines of blockaders were required to guard Southern ports. An inner line of shallow-draft blockaders watched the harbor entrances just out of range of Confederate seacoast forts. A second line of vessels ranged farther offshore, about one day's steaming from the coast. Finally, a

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[16] John B. Heffernan, "The Blockade of the Southern Confederacy: 1861-1865," The Smithsonian Journal of History (Winter 1967-1968), pp. 23-44; James Russell Soley, The Navy In the Civil War: The Blockade and the Cruisers (New York: Charles Scribner's Sons, 1883), pp. 90-91; James M. Merrill, The Rebel Shore: The Story of Union Sea Power in the Civil War (Boston: Little, Brown and Company, 1957), pp. 16-19.

[17] Register of the Commissioned and Warrant Officers of the Navy of the United States for the Year 1861 (Washington, D.C.: Government Printing Office, 1861), pp. 95-97; Report of the Secretary of the Navy, 1864, pp. V-XXIII.

"flying squadron" of fast steamers searched for blockade runners and Confederate cruisers on the high seas and off foreign, neutral ports.[18]

The "flying squadron" accomplished little in preventing illicit trading with the South, mainly looking for Confederate cruisers. Additionally, the activities of the flying squadron created several international diplomatic incidents. Commander Charles Wilkes of the San Jacinto, the commodore of the flying squadron, was responsible for the most serious breach of international law. He stopped the neutral British mail steamer Trent and removed the Confederate commissioners Mason and Slidell. Great Britain nearly went to war for this breach of international law. Thousands of troops were sent to Canada and the Royal Navy West Indies Fleet was considerably strengthened. Able diplomacy prevented war at a late hour.[19]

The Flying Squadron also occasionally violated the territorial waters of neutral nations in the zealous prosecution of suspicious vessels. Commander John A.

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[18] Soley, Blockade and the Cruisers, pp. 92-94; Robert M. Browning, Jr. From Cape Charles To Cape Fear: The North Atlantic Blockading Squadron During the Civil War, unpublished Ph.D. dissertation, University of Alabama, 1988. These dispositions changed as the war progressed. Each commander used his forces diffently, and the forces themselves changed over time.

[19] Norman B. Ferris, The Trent Affair: A Diplomatic Crisis (Knoxville: The University of Tennessee Press, 1977), passim; Evan John, Atlantic Impact, 1861 (London: William Heinemann Ltd., 1952), and D.P. Crook, The North, The South, And The Powers 1861-1865 (New York: John Wiley and Sons, 1974), pp. 99-170.

Winslow of the USS Kearsarge chased the blockade runner Juno from the Azores.[20] Commander Wilkes conducted undeclared blockades of both Bermuda and Nassau that further angered the British government after the Trent affair. On at least four other occasions Union navy vessels pursued blockade runners through neutral territorial waters in the Bahamas and off Cuba.[21]

The affair of the Blanche was one of the most serious. The British blockade runner Blanche was chased into Spanish territorial waters off Cuba by the USS Montgomery, run aground, and fired on while under the protection of a Cuban official and the Spanish Flag. The British and Spanish governments protested vigorously and in this affair, as in other similar matters, they maintained their neutral rights by diplomatic negotiation and military posturing.[22]

Blockade Running Develops

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[20] Letter from John Winslow to Monsieur Le Comte De Gueydon, Vis Admiral Prefet Maritime de l' Arrondissement," in John M. Ellicott, The Life of John Ancrum Winslow, Rear-Admiral, United States Navy, Who Commanded the U.S. Steamer "Kearsarge" in Her Action With the Confederate Cruiser "Alabama" (New York: G. P. Putnam's Sons, 1902), pp. 112-113, 122.

[21] James Morris Morgan, Recollections of a Rebel Reefer (London: Constable and Company LTD, 1918), pp. 100-101; Bernath, Squall Across the Atlantic, pp. 108-118; Regis A. Courtemanche, No Need of Glory: The British Navy In American Waters, 1860-1864 (Annapolis, Maryland: Naval Institute Press, 1977), pp. 92-95, 107-112.

[22] S. W. Jackman, "Admiral Wilkes Visits Bermuda during the Civil War," The American Neptune, 24, no. 3 (July 1963), pp. 208-211; Courtemanche, No Need of Glory, passim; Thelma Peters, "Running the Blockade in the Bahamas During the Civil War," Tequesta, V (1945), pp. 16-30; Bernath, Squall Across the Atlantic, pp. 99-107.

Confederate naval strategists planned to defend the coasts and rivers and to damage Union commerce by commerce raiding. Merchant marine activity was regulated by the "King Cotton" policy, a policy that led the South not only to honor the blockade, but to carry it a step further. Southern leaders believed that by withholding their most valuable export, cotton, from the world market, they could force foreign intervention on behalf of the Confederacy. Confederate leaders thought that foreign governments, particularly those of Great Britain and France, would intervene to regain the cotton supply needed to keep their factories working, and their people employed. Southern popular sentiment supported this view; cotton was voluntarily kept off the market in an attempt to gain prompt independence promptly.[23]

Not every Southerner, however, believed in the cotton embargo. Some such as Confederate foreign purchasing agent Louis Heyliger realized that supplies from abroad and cotton from the South had to pass the Union blockade in spite of the embargo. Early in the war he proposed that blockade runners be convoyed by the Confederate States Navy or, if Great Britain entered the war, the Royal Navy. The Royal Navy did convoy a few blockade runners past ships of the U.S. Navy flying

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[23] As an example see John Milton to George W. Randolph, June 25, 1862, OR, ser. IV, vol. 1, pp. 1173; Soley, Blockade and the Cruisers, pp. 45-46; Frank Lawrence Owsley, King Cotton Diplomacy: Foreign Relations of the Confederate States of America. 2nd ed. (Chicago: The University of Chicago Press, 1959), passim; Lester, Confederate Finance and Purchasing, pp. 4-6.

squadron but not as a matter of policy.[24] The use of convoy methods would have allowed large sailing vessels, otherwise too vulnerable to capture, to run the blockade.[25]

Only one attempt was made by the Confederacy to put this idea into action. The Secretary of War authorized Captain John N. Maffitt of the cruiser CSS Florida to take charge of, and convoy any blockade runners he met on his cruise into Confederate ports. Though Florida met many blockade runners on her cruises she did not convoy any. The blockade-breaking convoy idea was not put into effect. The difficulty of providing escorts and the reluctance to violate the King Cotton embargo defeated Heyliger's idea without trial.[26]

Confederate ambitions for independent nationhood included plans for a large, active merchant marine. Southern merchants wanted to control the trade that carried their cotton to Northern and foreign markets. They believed that Northern ship owners and factories received a disproportionate amount of the profit from cotton.

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[24] Report of Charles E. Fleming to Charles Wilkes, March 16, 1863, ORN, ser. I, vol. 2, pp. 124-125; Report of Charles Wilkes to Gideon Welles, April 8, 1863, ibid. pp. 147-147.

[25] Louis Heyliger to Judah P. Benjamin, December 27, 1861, OR, ser. IV, vol. I, pp. 815-816; Judah P. Benjamin to John Fraser & Company, January 5, 1862, ibid., pp. 830-831.

[26] George W. Randolph to John Newland Maffitt, April 11, 1862, OR, ser. IV, vol. 1, pp. 1055-1056.

Although desiring control of their trade, only a few Southern capitalists invested in the large vessels necessary for foreign trade prior to the war.[27]

The Southerners who envisioned steamship lines with Europe competed for dollars and political support with agrarian politicians who sought improvements in their regions. In the South, ocean steamship lines were seen as a Northern means to milk the public treasury of tax monies raised at Southern and Western expense. This idea persisted even when Southerners sought to promote direct overseas trade with the South. Southern steamship lines received few lucrative government mail contracts; unlike the Northern owned Collins and Vanderbilt Lines. Southern shipowners had to build their companies solely through private investments. In spite of the handicaps, supporters of Southern-owned deep sea shipping expanded their numbers and influence. By the 1850s a small, but vocal group of Southern aristocrats saw investment in overseas shipping to be vital to Southern interests.[28]

Before the war, John Fraser and Company, of Charleston, was the most progressive Southern ship-owning house. This company owned five large sailing ships trading predominately between Charleston and Liverpool. The company had offices in Liverpool doing business as Fraser, Trenholm & Company, and in New York as Trenholm Brothers. At the start of the war the principal partners were Charles K. Prioleau in Liverpool and George Alfred Trenholm in Charleston. As war

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[27] Albion, Rise of New York Port, pp. 95-121.

[28] Tyler, Steam Conquers The Atlantic, pp. 215-230.

loomed they closed the New York office and opened branch offices in Nassau as Henry Adderly & Co., and in Bermuda as Trenholm & Company. In expectation of the need for direct service from Europe to the South the company augmented its fleet with steamships. As the probabilities of secession increased, Fraser, Trenholm & Co. bought two large sidewheel Atlantic steamers and contracted for two large screw steamers to be built in Scotland.[29]

Blockade running existed from the earliest days of the blockade, primarily performed by small sailing vessels and a few coastwise steamers forced to desperate measures in order to earn a livelihood. At first this "blockade running" was only the continuance of pre-blockade routes within the South, entirely inside the limits of the blockade. Some Southern vessels did stop making voyages after the proclamation of blockade; many river and coastwise traders continued on their normal routes although they were technically violating the blockade. As the blockade became increasingly effective, most of these vessels were captured or removed from active service. As vessels were removed from riverine and coastwise trade, the profits for those that remained increased. Some intrepid shipowners even extended prewar routes and services to take advantage of the lack of competition.[30]

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[29] Ethel Trenholm Seabrook Nepveux, George Alfred Trenholm: The Company That Went To War, 1861-1865 (Charleston, South Carolina: Ethel S. Nepveux, 1973), pp. 21-24; and David Lyon, The Denny List, vol. 1; Wise, Lifeline of the Confederacy, pp. 46-47, 50-53.

[30] Sprunt, Tales of the Cape Fear Blockade, pp. 40-41; Soley, Blockade and the Cruisers, pp. 89-90, 123, 153-154; Merrill, The Rebel Shore, pp. 15-16.

A few vessels added or extended routes through the blockade to nearby neutral territories. The blockade did not prevent contact with the outside, but it made such contact more difficult and risky. Great profits awaited those willing to run the blockade. As these ordinary merchant vessels proved the permeability of the blockade, more vessels were encouraged to follow.

During the formation of the Confederacy, most of the larger vessels present in the South were requisitioned by the Army, Navy, and the individual states; the remainder were voluntarily kept in port by fear of the blockade and respect for the unofficial "King Cotton" embargo. Vessels for merchant trade were hard to acquire; experienced Southern shipbuilders did not want to build blockade runners on speculation. Lucrative contracts to build warships were being given to nearly all who said they could build a ship.[31] Popular sentiment, government requisitions, and the lack of new ships left only a few suitable vessels free to challenge the blockade early in the war.[32]

As time passed, and foreign governments did not intervene on behalf of the Confederacy, it became apparent that King Cotton diplomacy, was not effective. Supplies from abroad for the armies were badly needed; the only way to pay for them was by sending cotton and naval stores out through the blockade. Several vessels in

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[31] William N. Still, Jr., Confederate Shipbuilding (Columbia: University of South Carolina Press, 1987 reprint of 1969 ed.), p. 20.

[32] Wise, Lifeline of the Confederacy, pp. 25-27.

Southern ports made the attempt. Even more importantly, the Confederate government became directly involved in blockade running, owning and running its own ships.[33]

The privately-owned coasting sidewheeler Kate, under Captain Thomas Lockwood, became the most successful steamship of the early runners. Kate had been built before the war as Carolina by Samuel Sneden in Greenpoint, New York. She was small and slow but her captain was wily and knew the waters of the Southern coastline intimately. She continued her coastwise runs and made sixty successful runs between Nassau and Charleston, leading the way for other potential runners to follow. If the small, slow, coastwise steamer Kate could run the blockade, any suitable ship had a chance.[34]

The new iron-hulled, screw-propeller steamer Bermuda was the first European blockade runner. She was sent to Charleston as a private venture by Fraser, Trenholm & Company with a mixed cargo of private and government goods. She had

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[33] Lester, Confederate Finance and Purchasing, pp. 13-21; Richard Cecil Todd, Confederate Finance (Athens: University of Georgia Press, 1954), pp. 190-194; Richard D. Goff, Confederate Supply (Durham, North Carolina: Duke University Press, 1969), pp. 43-47; Kevin J. Foster, "Builders Versus Blockaders: The Evolution of the Blockade Running Steamship" in Clarke G. Reynolds, ed., Global Crossroads and the American Seas (Missoula, Montana: Pictorial Histories Publishing Co., 1988), passim.

[34] Kate was built as the Carolina by Samuel Sneden of Greenpoint, New York. Carolina, b)Kate, was a wooden sidewheeler, 165' X 29'10" X 10'4"; and 477 tons burden. Her promising career was ended by a snag in the Cape Fear River in 1862. Morgan, Recollections of a Rebel Reefer, p. 99; Wise, Lifeline of the Confederacy, p. 307.

been built for Fraser, Trenholm, along with her sister Bahama, and possessed all of the required qualities for service between European and Southern ports. Rather than wait for the end of the War of Secession, Bermuda was sent immediately to inaugurate trans-Atlantic steam service. Bermuda's voyage was successful; the blockade was proved penetrable by large vessels. After Bermuda returned to England, the Confederate government decided to enter blockade running directly.[35]

Confederate purchasing agents in Great Britain had obtained large quantities of arms, and other war material, in Great Britain, but had no way to deliver them. James Dunwoody Bulloch, the principal Confederate Navy agent in Great Britain, bought Fingal, a Clyde-built propeller coaster to answer the need. Although owned by the Confederate government, Fingal sailed under the British flag. She arrived at Savannah, Georgia, from Scotland by way of Terceira and Bermuda in November 1861 without sighting a single Union vessel. Fingal began the practice of blockade running under Confederate government control.[36]

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[35] Francis B.C. Bradlee, Blockade Running During the Civil War and The Effect of Land and Water Transportation on the Confederacy (Salem, Massachusetts: The Essex Institute, 1925), pp. 21-22.

[36] James Dunwoody Bulloch, The Secret Service of the Confederate States in Europe: Or, How the Confederate Cruisers were Equipped (2 vols., New York: Thomas Yoseloff, 1959), vol. 1, pp. 110-127; Maj. Edward C. Anderson, Confederate Foreign Agent: The European Diary of Major Edward C. Anderson, W. Stanley Hoole, ed. (University, Alabama: Confederate Publishing Company, 1976), pp. 67-72, 76-90; Merli, Great Britain and the Confederate Navy, pp. 243-244.

The blockade had been tested and found wanting; many more government-owned vessels would follow Fingal from Great Britain. As the war progressed, the South included blockade running not only in logistical planning but in strategic planning as well. Historian Frank Vandiver considers the administration of blockade running one of the most successful programs of the Confederate government.[37]

Specialized Vessels and the Entrepot System

After the government had proven the feasibility of running the blockade with steamships, a more substantial blockade running trade developed. The major problem in the trade was that blockade runners, as first envisioned, had to combine mutually exclusive steamship design requirements. They needed to outrun pursuit, which called for steam power, but could not carry sufficient coal for the voyage and still have room left for cargo. Great Britain was too far from the blockaded ports for fast steamships to trade economically.

Confederate and English companies, set up a system using two types of vessels in the trade. Capacious and slow sailing ships and steamers carried cargoes to intermediate island ports off Confederate shores. There the cargo was loaded onto small, swift vessels for the three- or four-day run into Southern ports. This two-

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[37] Frank E. Vandiver, Rebel Brass: The Confederate High Command System (New York: Greenwood Press, Publishers, 1976), pp. 114-120.

tiered system was more expensive than a direct trade but maximized the best qualities of the two vessel types. It created an effective blockade running system.[38]

The primary locations for trans-shipment between the large ordinary traders and the specialized blockade runners were the island ports of Hamilton and St. Georges, Bermuda; Nassau, New Providence, in the Bahamas; and Havana, Cuba. British and Spanish law required that cargo arriving at the entrepots be transferred through warehouses rather than from ship to ship. Most ships obeyed the law although occasionally cargoes were directly transhipped between long haul vessels and blockade runners.[39]

When the blockade running trade began in earnest the island entrepots handled tremendous amounts of trade and quickly grew into thriving trading centers.[40] A

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[38] Taylor, Running The Blockade, pp. 24-27; Soley, The Blockade and the Cruisers, pp. 154-155.

[39] Frank Leon to William P. Fessenden, November 23, 1864, and Theodore E. Allen to H.A. Gilbert, Jan, 13, 1865, Havana Consular Dispatches, Record Group 84, National Archives, Washington, D.C.(hereafter cited as RG84, NA); Michael P. Usina, "Blockade Running In Confederate Times," in Addresses Delivered Before the Confederate Veterans Association, Of Savannah, Georgia (Savannah, Georgia: George N. Nichols, 1895), pp. 33-34; Louis Heyliger to Judah P. Benjamin, December 27, 1861, OR, ser. IV, vol. I, pp. 815-816; lithograph illustration of Nassau, New Providence, Bahamas, circa 1864, in the collection of Dr. Charles Peery, Charleston, South Carolina.

[40] Taylor, Running the Blockade, pp. 25-27; Michael Craton, A History of the Bahamas (London: Collins, 1962), pp. 225-238; Walter B. Hayward, Bermuda Past & Present: A Descriptive and Historical Account of the Somers Islands (New York: Dodd, Mead & Company, 1911), pp. 72-102.

wartime description of Nassau serves to illustrate the blockade running boom in all the entrepots:

> The wharves of Nassau, during the war, were always piled high with cotton, and huge warehouses were stored full of supplies for the Confederacy. The harbor was crowded, with lead-colored, short-masted, rakish looking steamers; the streets alive with bustle and activity during day time and swarming with drunken revelers at night.[41]

Support industries grew up to perform vital hull and propulsion work on blockade runners and to provide them with coal. Blockade runner hulls required frequent scraping and repainting to maintain high speeds. Their cargoes had to meet customs requirements, be transhipped and warehoused. Their boilers needed retubing and repair; their engines, propellers, and paddlewheels needed repair; and their boiler furnaces required huge amounts of coal. The marine railways, drydocks, and shipyards at Halifax, Nova Scotia; St. Georges, Bermuda; St. John and St. Thomas, of the Virgin Islands; Havana, Cuba; Tampico, Mexico; and Nassau, New Providence, were kept busy with blockade runner hull and machinery work. Most repair and maintenance work could be affected at these ports.[42] For instance, when

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[41] Wilkinson, Narrative of a Blockade Runner, p. 123.

[42] For example see M.M. Jackson to William H. Seward, No. 46, October 27, 1863, Halifax Consular Despatches; Thomas Savage to William Seward, July 21, July 24, November 2, 1863, June 2, and October 8, 1864, and Thomas Savage to Rear Admiral E.K. Stribling, Dec. 2, 1864, and William T. Minor to W. H. Seward, January 19, 1865, Havana Consular Despatches, RG84, NA; Watson, Adventures of a Blockade Runner, pp. 306-307.

one engine of Coquette broke, less than two months were required to order and receive the parts from Scotland and replace nearly the entire engine. Some other repair materials were fabricated at Halifax for vessels disabled at Bermuda. More thorough overhaul or repair required that ships be sent back to the shipyards of Great Britain.[43]

The administration of the cargoes transhipped at the entrepots were handled by commission merchants and Confederate agents. They handled the paper work of entrances, clearances, duties, trans-shipment, and storage, and acted for the owners of vessels and cargoes. The warehouses at all of the entrepots remained full through much of the war. Valuable cargoes often had to wait outside, exposed to the weather, until ships could be found to carry them. Some ships were held up for months awaiting warehouse space or the chance to trans-ship their cargoes. Other ships owned by undercapitalized companies were held up by shortages of ordinary working capital. Companies with agents who solely represented their interests in the islands had advantages over those sharing agents with other companies.[44]

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[43] For information on some of the support services rendered to a single blockade running ship see the Logbook of C.S. steamship Coquette, Nov. 1863-Aug. 1864, "Vessel Papers" National Archives microfilm publication; M.M. Jackson to William H. Seward, no. 43, Oct. 14, 1863, RG 84, NA.

[44] An example is the large steamer Cumberland, which required extensive repairs and alterations at Havana and was held up for four months awaiting funds to load and clear the port. See letters of Thomas Savage to William Seward, November 2, and December 1, 1863, and January 16, 1864, Havana Consular Despatches, RG 84, NA; Vandiver, Blockade Running Through Bermuda, passim.

Vessels were required to obtain clearances from the custom house in the island entrepots. Clearances included information such as the name of the vessel, her nationality, tonnage, captain, cargo, and destination.[45] It was illegal for vessels to clear for blockaded ports, but they could clear for a nearby neutral port and change the destination once at sea. Thus runners bound from Bermuda to the Confederacy listed their destination as Halifax or Nassau; those from Nassau listed Bermuda or Halifax; and those from Havana listed Nassau or Matamoras.[46]

Cargo into the Confederacy was usually listed on manifests and clearances simply as "assorted" or "machinery." A northern spy described the process.

> There is [sic] many articles shipped here such as quinine, powder, caps, pistols, &c. They are placed on the manifests as different articles, such as eggs, stationary, &c. They avoid detection here by bribing the custom house officers and are not examined here at all but pass through paying the duties only on the articles that they say they contain.
>
> A portion of the goods that are shipped here are not cleared at the customhouse by the shippers according to law, and there is hardly a vessel that arrives here but has something contraband on board - (generally disguised so that the captains may not know anything about it.)[47]

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[45] Vandiver, Blockade Running Through Bermuda, passim.

[46] Thomas Savage to William Seward, no. 67, July 21, 1863, Havana Consular Despatches, RG84, NA.

[47] Theodore E. Allen, Havana, to H.A. Gilbert, Washington, D.C., Jan. 13, 1865, Havana Consular Despatches, RG 84, NA.

A new trade also grew up to supply the blockade runners' large coal requirements. The favored coal was Pennsylvania anthracite, but most of that nascent trade was cut off in early 1863, when the Northern government recognized the reason for increased demand from the islands.[48] Afterwards the principal supply came from Welsh coal ports, although North Carolina and Nova Scotia coals were occasionally utilized as well. Coaling ports were the most widespread supporters of blockade running vessels. They were located in the island entrepots, the blockaded ports, and also at ports located along the routes to America: Belfast, Ireland; Ferrol, Spain; the Azores and Madeira Islands; St. Thomas, Virgin Islands; St. Johns, Newfoundland; and Halifax, Nova Scotia.[49]

The success of a blockade running venture depended as much on the people who manned the blockade runners as on the vessels. High pay for officers and crew attracted the very best men available.

> Every nationality on earth, nearly, was represented there; the high wages ashore and afloat, tempting adventurers of the baser sort; and the prospect of enormous profits offering equally strong inducements to capitalists of a

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[48] Mr. Seward to Lord Lyons, Washington, January 9, 1863, in (Secretary of State), Papers Relating to Foreign Affairs in Messages of the President of the United States and Accompanying Documents to the Two Houses of Congress, 38th Congress, 1st Session, ex. Doc. No. 1 (Washington: Government Printing Office, 1864), pp. 489-490.

[49] For a typical, if unlucky, voyage to America, see the manuscript logbook of the blockade runner The Dare, October 31, 1863-January 3, 1864, Record Group 26, Records of the Bureau of Navigation, National Archives, Washington, D.C.; also see Wilkinson, Narrative of a Blockade Runner, pp. 116-123; and for a more general view see Vandiver, Blockade Running Through Bermuda, passim.

> speculative turn. The monthly wages of a sailor on board a blockade-runner was one hundred dollars in gold, and fifty dollars bounty at the end of a successful trip; and this could be accomplished under favorable circumstances in seven days. The captains and pilots sometimes received as much as five thousand dollars besides perquisites.[50]

Wily captains like Thomas Lockwood, who knew the coast intimately, could guide even a slow, unremarkable vessel, like Kate, past the ships of the Union blockade. Knowledgeable and enterprising supercargoes made the most advantageous use of the ships cargo capacity. Skilled engineers coaxed the utmost performance out of their ships. These captains, pilots, mates, supercargoes, and engineers of steam blockade runners were picked men, the best of their profession.[51] People made the difference between success and failure. With high quality vessels, first-rate crews, and a little bit of luck, success was nearly assured.[52] The city of Glasgow alone was

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[50] Wilkinson, Narrative of a Blockade Runner, pp. 123-124.

[51] There were exceptions: the sailing sloop-of-war Vandalia captured a brigantine blockade runner "whose captain was quite stupid," Rear-Admiral Daniel Ammen, The Old Navy and The New (Philadelphia: J.B. Lippincott Company, 1891), p. 344. Another steamer captain, on the approach of a Union warship, hid in his cabin below decks drinking while his passengers saved the vessel from capture, Morgan, Recollections of a Rebel Reefer, pp. 188-191.

[52] Wilkinson, The Narrative of a Blockade Runner, p. 85; Taylor, Running the Blockade, passim.

estimated to have sent 111 vessels to attempt the blockade, manned by approximately 3,330 men.[53]

Ownership of Blockade Runners

Early in the war, blockade running ships were owned by much the same companies and individuals as before the war. As the war progressed and conditions of blockade running changed, the patterns of ownership changed as well. The Confederate government and large companies could absorb the loss of vessels better than individual owners and smaller companies. Bad weather, coal, or luck might strike an individual ship and thus wipe out small operators. The loss of a single ship, however, could be absorbed by the government or a large company. The risk was spread even wider by joint stock companies. Several large stock companies operated from Great Britain, the island entrepots, and the Confederacy.[54]

The Confederate government was slow to take up blockade running on its own account. It made contracts with shipowners for carriage of government goods. The government was initially reluctant to engage in what was considered competition with

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[53] "Clyde Steamers and the Blockade," The Artizan, p.45, quoting from the Glasgow Morning Journal, (n.d.)

[54] For descriptions of large company operations see Taylor, Running The Blockade, pp. 93-94, and passim; Scharf, Confederate States Navy, p. 483; for government operations see Wilkinson, Narrative of a Blockade Runner, pp. 124-125; and for small companies and owner-operators see Watson, The Adventures of a Blockade Runner, passim.

private enterprise. As individual agencies ran into problems with private shippers, some bought blockade runners to carry government cargo. The government also owned blockade runners jointly with large ship owning companies. Joint government-commercial ownership of blockade runners spread meager funds farther as well as spreading the risk for both private and government owners. Late in the war, the merchant-government cooperative ventures became overly complicated and were gradually replaced by separate government and private ownership.[55]

Confederate regulations guiding the actions of blockade runners gradually proliferated as the war continued. Passengers were prohibited except with special permission.[56] One-half of all cargo space would be available to carry government freight. Ships were to be destroyed if capture appeared imminent. Increased regulation ensured the delivery of essential supplies and minimized risk for all concerned. Government regulations, enacted despite the laissez-faire ideals of

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[55] Stephen R. Wise, "Greyhounds and Cavaliers of the Sea: Confederate Blockade Running during the Civil War," in The Journal of Confederate History, vol. 4 (Brentwood, Tennessee: Southern Heritage Press, 1989), pp. 62-69; Frank Lawrence Owsley, State Rights In The Confederacy (Chicago: University of Chicago Press, 1925), pp. 110-149.

[56] William Oswald Dundas, "Confederate Veteran Recalls Blockade Running During the War Between the States," compiled by F. de Sales Dundas, The United Daughters of the Confederacy Magazine (November 1952), p. 12.

Southern leaders, maximized the precious foreign transportation assets of the Confederacy and kept the vital supply lines open.[57]

The blockade hampered Southern efforts to trade with the outside but never was able to stop foreign trade totally.[58] The federal navy became increasingly effective in closing Southern ports to blockade runners as the war progressed. Early in the war blockade runner success rates allowed about fourteen successful runs through the blockade for every capture. By 1864, this had dropped to one in six; and by 1865, the Union navy was capturing one runner for every four voyages.[59] The very high capture rate came as the largest part of the resources of the Union navy, about five hundred ships, were pitted against a fleet of runners that never numbered more than about 100 steamships at a time. The capture of so many runners is astounding; the escape of so many more, in spite of the seemingly overwhelming odds against them, is incredible.

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[57] Scharf, Confederate States Navy, p. 467; Owsley, State Rights In The Confederacy, pp. 110-149; Emory M. Thomas, The Confederacy as a Revolutionary Experience (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971), pp. 52-53, 64-65; Eaton, Southern Confederacy, p. 143.

[58] Wilkinson, Narrative of a Blockade Runner, pp. 130-132.

[59] Owsley, King Cotton Diplomacy, pp. 258-267.

Chapter II: EARLY BLOCKADE RUNNER VESSEL TYPES

Tiny rowboats, large steamers, full-rigged sailing ships, and every vessel in between attempted to run the Union blockade.[1] Conditions of the blockade weeded out the unfit vessels. Those that succeeded were strengthened to meet the demands. Vessel designs were improved continually throughout the war. Naval architecture and marine engineering were given a powerful boost by the demand for ever-better blockade runners. The new technologies that appeared prior to and during the Civil War largely determined the ultimate form of the vessels developed to trade with blockaded Southern ports.

To gain an understanding of the runner designs ultimately chosen by shipbuilders, one must study the poor examples along with the good and determine why some designs were better than others for the demanding blockade trade.

Large Sailing Vessels

Prior to the war large sailing vessels carried most of the directly-imported foreign trade to the Southern states. These sailing vessels, primarily ships and barks, with a few large three-masted schooners, were predominantly owned in the North or abroad. Direct trade with foreign ports had been replaced by coastwise trade with

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[1] Soley, Blockade and the Cruisers, p. 153.

New York, which became the principal entrepot for Southern products.[2] One writer estimated that Charleston, the leading Southern shipowning city, owned less than twenty-five ocean-going sailing ships in 1860.[3]

Several large Southern-owned vessels were confiscated in Northern ports and others were sold or forced to change registry for protection from capture. Therefore, when the war began, few large sailing vessels were available to serve as blockade runners.[4] Some vessels, such as the packet ship Susan G. Owens, were sold foreign. The ships Alliance, Eliza Bonsall, Emily St. Pierre, Gondar, John Fraser, and Monterey, were re-registered in Great Britain, but probably remained under Southern control.[5]

The few large sailing vessels that tried to violate the blockade were quickly captured or discouraged. At least two re-registered ships, Alliance, and Gondar, were condemned after capture; their transfer to British registry was disallowed by the

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[2] K. Jack Bauer, A Maritime History of the United States: The Role of America's Seas and Waterways (Columbia: University of South Carolina Press, 1988), pp. 126-128; Albion, Rise of New York Port, pp. 105-121, 400-401; Priestley C. Coker, Charleston's Maritime Heritage 1670-1865 (Charleston, South Carolina: CokerCraft Press, 1987), p. 195.

[3] Coker, Charleston, p. 197.

[4] Coker, Charleston, p. 199; Marcus Price, "Ships that Tested the Blockade of the Gulf Ports," The American Neptune, XI (October 1951), pp. 264-266.

[5] Reports of J.R. Goldsborough and Josiah Stone to S.F. Dupont, April 26 and March 18, 1861, ORN, ser. I, vol. 12, pp. 635-636; letter from H. Wilding to William H. Seward, July 5, 1861, ORN, ser. I, vol. 6, p. 34; letter from H. Wilding to Charles F. Adams, ORN, July 8, 1861, p. 47.

prize court.[6] The ship Thomas Watson, of Charleston, was rerigged as a bark in Liverpool and attempted to enter her home port in October 1861. She grounded on the bar and was destroyed by a blockader to prevent salvage.[7] Emily St. Pierre was captured, but retaken from the prize crew.[8] The large ship John Ravenel remained at her berth in Charleston to the end of the war.[9]

Most of the large vessels available for blockade running could only enter deep water harbors due to their draft. They were too expensive to risk when uncertain breezes could desert them under the guns of Union blockaders. They needed to carry large cargoes to make them pay, but few merchants wished to risk large cargoes in sailing ships. By the middle of 1862, high cost and general unsuitability to blockade running caused large sailing ships to disappear from Southern ports.

Southern Schooners and Other Craft

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[6] Madeline Russell Robinton, An Introduction to the Papers of the New York Prize Court, 1861-1865, Studies in History, Economics And Public Law, Number 515 (New York: Columbia University Press, 1945), pp. 143-144, 150-151.

[7] Letter from H. Wilding to W. F. Seward, August 23, 1861, ORN, ser. I, vol. 6, p. 213; letter from S.P. Lee to John Marston, October 15, 1861, ORN, ser. I, vol. 6, pp. 324-325.

[8] Bernath, Squall Across the Atlantic, pp. 120-129; Philip Van Doren Stern, The Confederate Navy: A Pictorial History (New York: Bonanza Books, 1962), pp. 110-111.

[9] Coker, Charleston, p. 200.

Smaller sailing vessels built in the South, sloops, schooners, and brigs, were fast, weatherly and had draft shallow enough to enter all Southern harbors. They were inexpensive and were built in large numbers in most coastal areas of the South. Most of these smaller, shallow-draft vessels used centerboards for better sailing in deeper water. The advantages of speed, weatherliness, and shallow-draft were offset by their small cargo capacity and total reliance on the wind to escape steam-propelled blockaders. Southerners had developed these sloops and schooners and thus were completely familiar with their qualities and drawbacks.

Small sailing vessels ran the blockade successfully throughout the war but found their operations restricted in area. For instance, small sailer craft could not hope to run the blockade of North and South Carolina successfully after late-1863, due mainly to the numbers of blockaders guarding the coast. Slow sailing vessels were vulnerable to steam blockade patrols because they were exposed to capture for a longer period. Only very old, expendable sloops and schooners and a few swift pilot schooners and yachts tested the Atlantic blockade after early 1863.[10]

In other areas small sailers continued to operate through the war. Where the blockade was maintained by sailing ships or where there were few steamers, small

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[10] The Savannah pilot schooner Glide was captured in early 1863 loaded with 72 bales of cotton. The former Fernandina pilot schooner Wave, ex-Friends, and the sloop yacht Mercury were captured about the same time. Dupont to Welles, March 1, 1863, ORN, vol. 13, pp. 429-430, 499-500, 682-685. The former Charleston pilot schooner Rover, loaded with cotton, was destroyed in Murrell's Inlet, October 17, 1863. RADM Dahlgren to Welles, November 6, 1863, ORN, ser, I, vol. 15, p. 59. See also Soley, Blockade and the Cruisers, pp. 89-90.

sailing vessels stood a good chance of evading blockaders. The Gulf of Mexico and the Atlantic coasts of Florida and Georgia offered opportunities for swift, light-draft, centerboard schooners to escape capture. This "guerilla form of contraband traffic" gradually decreased, but lasted through the end of the war.[11] As late as September 1864 fourteen schooners were reported at Galveston and ten in the Brazos River waiting for a favorable wind to run out.[12] Boats of as little as four tons, carrying but one and one half bales of cotton, traveled from Florida to the Bahamas and Cuba. Historians have generally neglected small sailing vessels in blockade running accounts, but they were an important factor in illicit trade.[13]

Many ship owners who operated out of the Gulf preferred to use schooners because the initial cost and running expenses were so much less than for steamers. The owners risked smaller amounts of capital with schooners and stood a chance for large profit. Coal for steamships was generally unavailable in the Gulf states, requiring runners to carry coal for a round trip in and out through the blockade. Coal

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[11] William H. Nulty, Confederate Florida: The Road to Olustee (Tuscaloosa: University of Alabama Press, 1990), pp. 42-45, 51; A.J. Hanna, Flight Into Oblivion (Richmond, Virginia: Johnson Publishing Company, 1938), pp. 159-160.

[12] Thomas Savage to W.H. Seward, Despatch No. 205, Sept. 17, 1864, Havana Consular Despatches, RG 84, NA.

[13] Thomas Savage wrote W.H. Seward, on June 19, 1863, of a small boat which brought 1 1/2 bales of cotton from Tampa to Havana and returned with 16 1/2 pipes of Aguardiente, a dangerous form of sugar cane liquor. Havana Consular Despatches, RG 84, NA; for more general comments on small sailing vessels see Watson, Adventures of a Blockade Runner, p. 323; Soley, Blockade and the Cruisers, pp. 124-125, 142-143, 153-154.

storage took up space otherwise available for cargo. Additionally, steamers often gave themselves away by their smoke. For protection from blockaders, schooners depended on tactics and stealth; steamers depended primarily on their speed.[14]

Schooners in the Gulf of Mexico complemented the steamers, carrying heavier goods that few steamers preferred to carry. Bar iron, furnace grating bars for river steamers, machinery, gunpowder, clothing, mail, and foodstuffs made up the inbound cargoes; cotton and naval stores made up the outbound cargoes.[15]

Blockade runner captain William Watson described the blockade running schooners of the Gulf Coast:

> The model of a vessel best adapted for sea-going purposes is of what is called the flat-sharp kind. The rise in floor from keel to bilge, about one in six. The breadth of beam should never be less than three and a half times the depth of hold, or three times the total depth, and the length for sea-going purposes never to exceed four times the breadth of beam. The keel, which must be of great breadth and strength, extends only a few inches below the planking of the bottom. Up the center of the keel, in a line straight fore and aft, is made a slot, of sufficient width to admit the center-board, and as long as can be gained with convenience and safety. From the upper side of the keel this slot is cased round with strong planking, which is carried up to the deck beams. In this well works the center-board, the breadth of which corresponds with the depth from the lower side of the deck beams to the bottom of the keel. It is rounded at

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[14] Watson, Adventures of a Blockade Runner, pp. 236-237.

[15] Watson, Adventures of a Blockade Runner, p. 249.

> the forward end, and at the extreme point a hole is made and a strong pivot bolt, passing through the casing, passes through the hole in the center-board, and holds it there, allowing the after end to work up and down. This end is generally worked up and down by means of an iron bar with tackle attached, or other appliance. By means of this bar the center-board is pushed out through the keel and forms a blade which holds up the vessel and prevents her going to leeward, which she would otherwise do on account of her flat bottom and light draught of water . . . . Their great utility . . . is in crossing bars and shoals where a deep vessel cannot go, as the center-board can be drawn up and the draught of the vessel reduced to suit the depth of water, and then be let down again as the water deepens.[16]

The schooners of this type had low bulwarks, tall masts, and large sails of heavy cotton canvas. The masts were stepped beyond either end of the centerboard, farther apart than on most contemporary schooners. The bowsprit and flying jibboom set a very large forestaysail and flying jib. The foremast was often "bald-headed" with no topmast, and the foresail loose-footed and overlapping the mainmast slightly. The mainmast set a very large hoisting gaff sail extended far beyond the stern by the boom and also set a gaff topsail extended upwards by a pole supported by a light topmast. A triangular main topmast staysail was also set for extra speed.[17]

Chesapeake Bay log canoes were another type of native Southern small sailing craft that saw service running the Union blockade. Union picket boats and blockaders

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[16] Watson, Adventures Of A Blockade Runner, pp. 4-7, 220.

[17] Watson, Adventures of A Blockade Runner, pp. 4-7, 220.

in the Chesapeake were generally spread thin giving enterprising blockade runners a chance to slip between the eastern and western shores of the Bay. They carried supplies, news, and spies across the Bay and along its many tributaries and estuaries. Although they did not run to neutral countries, these tiny blockade runners did valuable service maintaining internal communications within the Confederacy.[18]

Log canoes had been developed to a high degree on the Chesapeake by 1860, and their most extreme development was built for racing. Racing log canoes were longer in relation to beam then their working relatives and carried much larger rigs. The light, slim racing canoes with huge sailing rigs were by nature unstable, and required "spring" or "hiking" boards to keep them upright. "Spring" boards were narrow planks, twelve to fifteen feet long, with the inboard end run over the weather gunwale and tucked under the lee rail. One or two men perched at the end of the springboard, countering the force of the sailing rig.[19]

Southern Steam-Auxiliary Sailing Vessels

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[18] Marion V. Brewington, Chesapeake Bay: A Pictorial Maritime History (Cambridge, Maryland: Cornell Maritime Press, 1953), p. 200; Soley, Blockade and the Cruisers, p. 87.

[19] Marion V. Brewington, Chesapeake Bay Log Canoes and Bugeyes (Cambridge, Maryland: Cornell Maritime Press, 1963), p. 27; Howard I. Chapelle, American Small Sailing Craft: Their Design, Development, and Construction (New York: W.W. Norton & Company, 1951), pp. 291-304.

Southerners had long cherished a dream to have steamship service directly to Europe from the South. In the late 1850s plans were underway for steamship lines between the South and a number of European ports. Several of these lines were formed and construction of vessels began in Northern and British shipyards. The ships built were large, moderate-draft, steam-auxiliary sailing ships. Construction continued in Scottish and English shipyards even after the Southern states seceded. Southern, British and French capitalists expected to reap high profits from the new steamship lines due to the low tariffs promised after an expected swift Confederate victory.[20]

The ships built for the new Southern steamship lines were large steam-auxiliary sailing vessels. Circassian, built in 1858; Economist, built in 1860; Memphis, built in 1861; and Columbia, built in 1862, all possessed the same general characteristics of steam-auxiliary sailing ships. They were fairly large; had complete, if not huge, sailing rigs and could carry large cargoes economically on a regular schedule.[21]

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[20] Tyler, Steam Conquers The Atlantic, pp. 215-230, 293-309.

[21] Circassian was 191 x 26 x 17.6; 572 gross tons, 389 register tons; 819 tons burden; she ran the blockade twice, was renamed Bonita in August 1862, and thereafter transported supplies to the islands. Memphis was 230 x 30 x 19.5, 1010 gross tons; 1780 tons displacement; she was captured on her second rum through the blockade in 1862. Wise, Lifeline of the Confederacy, p. 312. Columbia was 168 x 24 x 14; 503 tons burden. She was captured at sea in August 1862. Wise, Lifeline of the Confederacy, p. 294.

When the wind was right steam-auxiliary vessels sailed and saved fuel. When the wind was insufficient or from the wrong quarter they steamed and saved time. When sailing, the propeller was disconnected to freewheel, and the fires were banked and allowed to go down.[22] Many ships in this era had screw-propellers that could be disconnected and hoisted from the water when sailing to reduce drag.[23]

Similar vessels were built for several trades including mail service to the Gulf of Mexico and the West Indies; steam clipper service between Great Britain and South Africa, India, and Australia; and the nascent service from Europe to the South.[24] Steam-auxiliary sailing ships from each of these trades might have been adapted to blockade running early in the war, but their moderately deep draft prevented them from entering ports such as New Orleans, Savannah, and the deeper ship channels at Charleston and Mobile. Since these ports were captured early in the war or were

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[22] For an example of this practice see Frank M. Bennett, The Steam Navy of the United States: A History of the Growth of the Steam Vessel of War in the U. S. Navy, and of the Naval Engineer Corps (Pittsburgh, Pennsylvania: Warren & Co., 1896), p. 556.

[23] N. P. Burgh, A Practical Treatise on Modern Screw Porpulsion (London: E. and F. N. Spon, 1969), pp. 78, 130-140; N. P. Burgh, Modern Marine Engineering (London: E. & F. N. Spon, 1867), pp. 321-324; John Bourne, A Catechism of the Steam Engine (New York: D. Appleton & Co., 1864), p. 241.

[24] David R. MagcGregor, Fast Sailing Ships, Their Design and Construction, 1775-1875 2nd ed. (Annapolis, Maryland: Naval Institute Press, 1988), p. 224; John M. Maber, The Ship: Channel Packets and Ocean Liners, 1850-1970 (London: Her Majesty's Stationery Office, 1980), pp. 14-19.

heavily blockaded the ships were better suited for conversion to warships by the vessel-starved Confederate Navy than for use as blockade runners.

One of the steam-auxiliary sailing ships, Bermuda, was the first large ship to run the blockade into a Southern port. By the time the remainder of the ships built in European yards for service to the South were completed, the blockade had tightened and they proved unsuitable to challenge the Union cordon. Later in the war several steam auxiliary ships carried cargo to the island entrepots for trans-shipment to smaller, swifter vessels for the final leg of the journey to the south. Bermuda's sister ship Bahama carried supplies out to the island entrepots until 1863, when she was sold. Bahama entered the China tea trade in competition with the fastest sailing clippers of her day, and beat the fastest by twenty-eight days.[25]

The Southerner, launched March 8, 1863, was a vessel of the large steam-auxiliary class built to carry supplies to the entrepots after it became clear that the type was not suitable for blockade running. She was built for Fraser, Trenholm, a firm that built and maintained state-of-the-art vessels. Her characteristics demonstrate what the South sought in such a ship as opposed to the steam-auxiliary sailing vessels tried in blockade running and put to work later supplying the islands.

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[25] Tyler, Steam Conquers the Atlantic, pp. 293-309; Wise, Lifeline of the Confederacy, pp. 50-52; David R. MacGregor, The Tea Clippers, Their History and Development 1833-1875. 2nd ed. (London: Conway Maritime Press, 1983), pp. 233-234; and Fast Sailing Ships, pp. 224-225.

The Southerner measured 1953 tons builder's old measurement and 2090 tons register. She was 294'8" long, (310' from figurehead to stern) 38'2" in beam, and 22' in depth of hold. The hull was composite built with wooden planking over iron frames. She was powered by direct-acting engines 40 inches in diameter, with a 33-inch stroke, producing 300 nominal horsepower. The engines were constructed by Fossick and Hackworth, and "fitted with superheating and feedheating apparatus and other recent improvements." She attained the respectable speed of 12 1/2 knots on her trials June 3, 1863. In expectation of a swift Southern victory she was lavishly fitted for passengers with both Confederate and British emblems and designs in the cabin.[26]

Southern Riverboats

At the start of the Civil War river steamboats were the most common type of steam vessel in the South. In the decades before the war, a huge internal waterborne trade had developed in the United States, dwarfing salt water commerce, largely through the use of river steamboats. Southern investment in waterborne trade primarily supported internal riverborne and coastal commerce. Southern trade

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[26] "Launches of Steamers: The 'Southerner'" in The Artizan, April 1, 1863, p. 63; and "Steam Shipping: The 'Southerner'" in The Artizan (July 1, 1863), p. 165; depositions of John Baxter Langley and William M. Blakiston, June 2, 1863, in Messages and Documents (1863), part 1, pp. 305-309.

thinking emphasized internal improvement rather than foreign or long-distance trade as did Northern capitalists.

The majority of Southern rivercraft were sidewheel, high-steam-pressure, shallow-draft boats. A few were driven by sternwheels or screw propellers. The eastern and western rivers each produced major groups of riverboat designs suited to their rivers. eastern rivers were generally deeper, slower, and their waters more prone to large waves. The western rivers were shallower and faster.

One of these eastern riverboats, Chatham, was one of the oldest iron vessels in America. She had been built in the yard of John Laird in Birkenhead, England in 1828, disassembled and marked, and then reassembled in Savannah. Following the success of Chatham, Laird's built several other prefabricated shallow-draft steamboats for use on the Savannah River.[27] In 1863, the forty-five-year-old Chatham became the oldest iron vessel to attempt to break the blockade. She was dangerously unseaworthy and should not have attempted an open ocean passage. Luckily for her crew, she was caught by the Union navy on her first attempt to run out of Savannah.[28]

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[27] Entry for Vessel No. 6, Chatham, in Estimate Book No. 1, Cammell Laird Archives, Birkenhead, England; John Harrison Morrison, Iron and Steel Hull Steam Vessels of the United States (Salem, Massachusetts: The Steamship Historical Society of America and Peabody Museum, 1945), p. 2.

[28] "Vessel No. 6, Chatham, in Laird's Estimate Book No. 1, p. 10, Cammell-Laird Archives, Birkenhead, England; and numerous letters after her capture reveal that Chatham was under repair more than she was in service. Report of Commander Reynolds to Adm. John A Dahlgren, Dec. 16, 1863, ORN, ser. I, vol. 15, pp. 179, and reports

One major eastern steamboat route connected Charleston and Savannah with Jacksonville and Palatka, Florida on the St. Johns River. In addition to continuing coastal service early in the war, despite the blockade, St. John's River steamboats made runs through the blockade to the Bahamas. The steamer Saint Johns was caught on her second attempt to pass the blockade, was sold, and returned to pass the blockade two more times as Spaulding. The sidewheelers Darlington and Hattie Brock were captured in Florida rivers.[29] The New York-built Soler, the former Fall River steamer Worcester, was lost at sea on her first run into Mobile from Havana.[30] Only Little Lilly, the former New York sidewheeler Flushing, had a successful career as a blockade runner. She ran the blockade successfully eleven times before being destroyed near the entrance to the Suwanee River in Florida, on her twelth trip.[31] Eastern river steamboats generally did not prove to be successful blockade runners. They were fragile compared to coastal steamers. River steamers

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of John A. Dahlgren, which include Chatham, on list "repairing," pp. 550, 629, 657; and ORN, ser.I, vol. 16, pp. 28, 39, 55, 126, 281, 292, 303, 349, 352.

[29] Edward A. Mueller, St. Johns River Steamboats (Jacksonville, Florida: Edward A. Mueller, 1986), pp. 45-48; and Steamboating on the St. Johns 1830-1885: Some Travel Accounts and Various Steamboat Materials (Melbourne, Florida: South Brevard Historical Society, 1980), pp. 51-57.

[30] Letters from Thomas Savage to William H. Seward, April 21, May 19, June 19, 1863, Havana Consular Despatches, RG 84, NA; Morrison, History of American Steam Navigation, p. 328; Wise, Lifeline of the Confederacy, p. 321.

[31] Thomas Savage to William H. Seward, July 29, 1863, Havana Consular Despatches, RG 84, NA; Wise, Lifeline of the Confederacy, p. 309.

required milder weather and slower speeds in moderate seas. Slow speed resulted in capture, high speed resulted in damaged vessels.

The western rivers steamboat type developed from the early 1820s river steamboat designs credited to Henry Schreve into a mature design that, for a time, was the principal vehicle for westward expansion. The steamboats grew larger, faster, more capacious, and more comfortable in the years prior to the Civil War. They also developed along sundry lines into several distinct types. Packets carried passengers and high-value freight. Ferries operated across or along rivers, carrying almost everything. Towboats pushed barges or ocean-going sailing ships into port. Both packets and sidewheel towboats challenged the blockade in the Gulf.

Although river steamboats were built in many places around the country, the majority of western rivers steamboats were built in a few ports along the Ohio River, primarily Pittsburgh, Pennsylvania; Wheeling, (West) Virginia; Cincinnati, Ohio; New Albany, and Jeffersonville, Indiana; and Dubuque, Iowa.

Vessels built on the Ohio and Mississippi Rivers and their tributaries operated not only on the Ohio, Mississippi, Missouri, and other western rivers but also on southern rivers emptying directly into the Gulf of Mexico from West Florida to Texas. The Rio Grande, Brazos, Sabine, Tombigbee, Alabama, Black Warrior, Appalachicola, Chattahoochee, Flint, and Suwannee Rivers all floated vessels built on the Ohio. Southern riverboat owners were not able to obtain enough steamboats from

Southern yards and turned to the North for additional vessels. Steamboats of all types were brought from the North to supplement scarce Southern-built boats.[32]

The most numerous riverboat type available for blockade running on the Gulf Coast were river packet boats. They were fast, could carry large cargoes in very shallow waters, were reasonably maneuverable, and were inexpensive compared to other steamers. River packet hulls were flat-bottomed with sharp bows and sterns for speed. Most were designed for service on rivers of less than six feet in depth. Large boilers and powerful engines on the main deck drove huge wooden paddlewheels slung astern or on each side of the hull. The main deck extended far beyond the side of the boat, supported by an ingenious system of iron rods and wooden beams called hogging chains. Mixed freight was carried on the capacious main deck around the machinery. Some packets carried cotton piled three decks high alongside the superstructure. The superstructure held elegant salons and private rooms for passengers over the boilers and engines. A pilothouse enclosed the ship's (steering) wheel atop the super-structure.[33]

River packets seemed ideal for use as blockade runners. But they suffered from several fatal flaws: their frail hulls could not stand the pounding of coastal swells at high speed, their low freeboard allowed even moderate waves aboard, and

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[32] Frederick Way, Jr., Packet Directory, 1848-1983 (Athens: Ohio University, 1983), p. 482.

[33] Bates, Steamboat Cyclopoedium, passim.

their high superstructures and metacentric height made them susceptible to capsizing in heavy winds. Blockade running riverboat captains and crews faced not only the dangers of the blockade but those of dangerously unsuitable vessels as well. Confederate government officials and river boat owners knew well of the unseaworthiness of riverboats, but the desperate need for supplies and the chances for huge profits outweighed the dangers.

The first riverboats to attempt the blockade met with mixed success. At least three river steamboats left the Mississippi River for foreign ports. The sternwheel packet Wave, built in 1863 at Monongahela, Pennsylvania, as Argosy 2, was purchased and converted into the Union tinclad gunboat #45, USS Argosy 2. In service near the mouth of the Mississippi at Calcassieu, Louisiana, she was captured by Confederate forces and sold to Thomas W. House for use as a blockade runner. She disappeared from the records prior to the fall of New Orleans and is believed to have escaped to Mexico.[34]

The other two steamboats to flee the Mississippi were apparently not as fortunate. Enterprise had been built as the sternwheel packet America at Brownsville, Pennsylvania, in 1852. Sold south in February 1862, she was converted for use as a towboat, assisting ocean-going vessels through the entrances to the Mississippi. Enterprise was rebuilt with a smaller towboat-style superstructure to cover her four

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[34] Way, Packet Directory, p. 482; Wise, Lifeline of the Confederacy, p. 326.

boilers and was given two masts. With the capture of New Orleans expected momentarily, Captain O.A. Pitfield took the chance to escape. Enterprise was caught at sea in a storm and was lost on March 15, 1862. Pizarro, the third and most mysterious would-be Mississippi riverboat blockade runner, was owned by Andrea T. Alexander of New Orleans. She escaped from the Mississippi but was never heard from again. She may have foundered at sea.[35]

The disappearance of the three riverboats after escaping from the Mississippi did not deter the Confederate army from attempting blockade running with other fragile river craft in the Gulf. The Quartermaster Department planned a line of river steamers to operate between Mobile and neutral Havana. In early 1863 few sailing blockade runners were returning safely to the Confederacy from abroad. Steam blockade runners arriving from Great Britain found ports in North and South Carolina more convenient than those on the Gulf. Riverboats could be used to run the blockade to Cuba and Mexico and supply the Western armies, hypothesized the Confederate government.

The Quartermaster Corps needed supplies delivered on the Gulf coast and set up a system to encourage riverboat owners to send vessels to violate the blockade. The Quartermaster Corps at Mobile partially insured riverboat owners against financial loss if they would risk the blockade. The Army would pay half of the value

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[35] Way, Packet Directory, pp. 19, 152-153, 482; Wise, Lifeline of the Confederacy, pp. 298, 316, 326.

of the lost boat provide the cotton and rosin cargo at no cost, and split half of the profits with the owners. This was the only occasion during the war when owners of blockade runners were guaranteed against loss. The owners of many of the finest riverboats operating in Alabama accepted the offer.

Riverboats presented the Quartermaster Department with a chance to obtain supplies from abroad but their withdrawal from river trade placed additional strain on the already taxed internal transportation system of the Confederacy. Riverboats were the primary mode of transportation within Alabama and the withdrawal of so many irreplaceable vessels was viewed with alarm by some Alabamians. They protested the loss of their river fleet to the governor, who protested in turn to James Seddon, the Confederate Secretary of War. In spite of the protests, a fleet of over a dozen former Alabama river and coastal steamers was prepared to run the blockade. The riverboat runners included the largest boats on the river, the packets James Battle and Alabama.[36]

The route used by riverboat runners took them out on the open sea on escaping port; then they hugged the coast, hiding when necessary, and finally ran across the Florida Strait to Havana, or the Bahama Channel to Nassau. Even using every bit of cover available, and all the skill of their officers, the riverboat runners were not

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[36] P. Hamilton to John Gill Shorter, March 25, 1863, in The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies (Washington, D.C.: Government Printing Office, 1900), ser. IV, vol. II, p. 462. For a description of the Army arrangements with ship owners see Wise, Lifeline of the Confederacy, pp. 170-174.

successful blockade runners. Their weak hulls with limited freeboard could not be driven hard in a seaway; most were captured while making the offshore portions of their voyages.

Southern Coastal Steam Packets

The type of Southern vessel best suited to blockade running already combined the qualities needed for success. The steam packets that carried passengers, mail, and high-value freight along the coast were fast, maneuverable, seaworthy vessels capable of entering most shallow Confederate ports. These ships were predominantly sidewheel-propelled steamships with minimal sailing rigs.

The limited coal supply and huge coal requirements of coastal steam packets were their principal drawbacks. The highly visible design with a large freeboard and high superstructure made them easy for blockaders to spot. Most were equipped with vertical or "walking beam" engines that extended through the top of the superstructure. The walking beam was both vulnerable to gunfire and highly visible.[37] Sidewheel coasters were more seaworthy than river vessels, but not designed for true seagoing use: at least one, Black Joker, foundered in the Gulf of Mexico.[38]

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[37] Sprunt, Tales of the Cape Fear Blockade, p. 51.

[38] Sprunt, Tales of the Cape Fear Blockade, p. 53.

In spite of the less-than-perfect design, about a dozen of these coastal sidewheelers operated very successfully through the blockade. Most of them had been built before the war. The principal builders were Harland and Hollingsworth; and Pusey & Jones of Wilmington, Delaware; Jeremiah Simonson and William H. Webb of New York; and Samuel Sneden of Greenpoint, Long Island.[39]

The passenger and freight coaster Cuba, built by Samuel Sneden in 1855, represents the largest class of wooden merchant vessel. She was 250 feet long on deck, 32 feet, 8 inches in breadth, and 9 feet in depth of hold. Her scantlings were small but the entire hull was diagonally double strapped in iron beneath the planking. A three-deck superstructure rose above the hull to extend its capacity. In spite of her large size Cuba drew only 6 and 1/2 feet of water. A single-cylinder, vertical (walking) beam engine of 56-inches in diameter with a ten-foot stroke drove Cuba's sidewheels. The paddle wheels were 30 feet in diameter and revolved at up to 18 revolutions per minute. Cuba was burned to prevent capture on her eighth trip through the blockade in 1863.[40]

Many Southern packets were owned by New York merchant Charles Morgan's Southern Steamship Company. The Southern Steamship Company had operated

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[39] David B. Tyler, The American Clyde: A History of Iron and Steel Shipbuilding on the Delaware From 1840 to World War I (Newark: University of Delaware Press, 1958), pp. 10-25.

[40] C.H.H., "Particulars of the Steamboat Cuba," in Journal of the Franklin Institute. vol. 59 (January 1855), p. 57; Wise, Lifeline of the Confederacy, p. 295.

fifteen ships to deep South seaports before the war. During the war Morgan transferred many of these vessels to his Southern son-in-law, Israel C. Harris, of New Orleans. The Morgan Line steamers were admirably adapted to work on the Southern coast and proved to be successful blockade runners.[41]

The Morgan packet Austin may be taken as representative of the Harlan and Hollingsworth-built ships that became blockade runners. They were distinguished from most coastal sidewheelers by their iron hulls. Constructed in 1860, Austin was a sidewheeler of 643 tons burden. She was 203 feet long, 34 feet in beam, and 10 feet in depth of hold. Her return flue boiler provided steam at 25 PSI to a vertical (walking) beam engine. The engine turned the 30-foot diameter paddlewheels at up to 17 revolutions per minute. She had been designed to operate in the shallow waters of the Southern coast. Austin was renamed Donegal in 1862, and ran the blockade successfully nine times before being captured in the Gulf by the USS Metacomet.[42]

Several other Harlan and Hollingsworth ships also became successful runners. William G. Hewes, built in 1860, and the smaller Cecile built in 1857, each ran the blockade nine times; Atlantic ran it successfully six times. Matagorda, built in 1858, ran the blockade successfully eighteen times before being captured in 1864 outside

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[41] James P. Baughman, Charles Morgan and the Development of Southern Transportation (Nashville, Tennessee: Vanderbilt University Press, 1968), pp. 116-122.

[42] "Particulars of the Steamer Austin," in Journal of the Franklin Institute, 64 (April 1860), p. 324; Wise, Lifeline of the Confederacy, p. 289.

Galveston. One packet of the Morgan Line, Zephine, built in 1864, blatantly kept her New York registry and ownership while operating as a blockade runner.[43]

The Morgan Line steamer General Rusk had similar dimensions to those of Austin but not her success. As Blanche, the former General Rusk made two runs but was destroyed on returning to the Cuban coast when she was attacked in neutral waters by the USS Montgomery.[44]

Ella, similar to Cecile, was built in Brooklyn in 1863 for sale to the Confederacy. Captured on her first run into a Southern port, she was bought from the prize court by the U.S. Navy and became USS Philippi.[45]

Among the other coastal sidewheelers which became runners were Carolina, Florida, St. Marys, Nina, Orizaba, William Seabrook, C.Vanderbilt which ran the blockade as Black Joker, and Governor Dudley which ran the blockade as Nellie.[46]

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[43] C.H.H., "Particulars of the Steamer Wm. G. Hewes" Journal of the Franklin Institute, 71 (September 1861), p. 270; "Particulars of the Steamer Cecile" Journal of the Franklin Institute, 64 (November 1856), p. 352; Baughman, Charles Morgan, pp. 116-125; Wise, Lifeline of the Confederacy, p. 26.

[44] Bernath, Squall Across the Atlantic, pp. 100-107; Wise, Lifeline of the Confederacy, pp. 83-84, 302.

[45] Wise, Lifeline of the Confederacy, p. 297.

[46] "Steamships of the Southern Steamship Company," May 4, 1861, ORN, ser. 1, vol. 16, p. 820; C.H.H., "Particulars of the Steamer Orizaba," Journal of the Franklin Institute, 66 (May 1858), p. 121; Paul H. Silverstone, Warships of the Civil War Navies (Annapolis, Maryland: Naval Institite Press, 1989), p. 232; Sprunt, Tales of the Cape Fear Blockade, pp. 51-54.

Calhoun and Nashville both served briefly in the Confederate States Navy and as privateers before becoming blockade runners.[47]

Several suitable coastal sidewheelers never tried the blockade, for they were taken into the Confederate navy and sunk in action before the value of such vessels in blockade running became apparent. Galveston and Charles Morgan served in the Confederate States Navy as General Quitman and Governor Moore. Both were sunk on April 24, 1862, during the desperate battle in defense of New Orleans.[48] The Atlantic seaboard coastal steamers Yorktown and Jamestown were taken over by the Virginia State Navy, renamed Patrick Henry and Thomas Jefferson, armed, and absorbed into the Confederate navy. Both fought at the battle of Hampton Roads. Thomas Jefferson made a single commerce raid down into Hampton roads and captured three Union vessels. She was sunk as a blockship at Drewry's Bluff in 1862. Patrick Henry became the schoolship for the nascent Confederate Naval

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[47] Robinson, Confederate Privateers, pp. 33, 37-40, 129-132, 253-254; "Particulars of the Steamer Nashville," Journal of the Franklin Institute, 57 (March 1854), p. 200; Naval History Division, Navy Department, Dictionary of American Naval Fighting Ships, vol. II, (Washington, D.C.: U.S. Government Printing Office, 1963, hereafter cited as DANFS), pp. 505-506, pp. 551-552.

[48] C.H.H., "Particulars of the Steamers Galveston and Opelousas" Journal of the Franklin Institute, 63, (April 1857), p. 285; "Particulars of the Steamer Charles Morgan" Journal of the Franklin Institute, 57 (February 1854), p. 131; David D. Porter, Naval History of the Civil War, reprint ed. (Secaucus, N.J.: Castle Press, 1984), pp. 178, 183; DANFS, vol. II, pp. 524, 529.

Academy on the upper James. She guarded the obstructions at Drewry's Bluff until the evacuation of Richmond in April 1865, when she was scuttled.[49]

Screw-propelled coastal cargo steamships were also moderately successful as blockade runners. They were less expensive to build and operate, but were not very fast. All of the screw-propelled coastal steamers were taken into naval service. The Caribbean steamer Havana, armed and refitted as the CSS Sumter, operated as a commerce raider under Raphael Semmes.[50] The larger Marques de la Habana, also renamed Sumter, was armed and refitted to serve as a commerce raider. But she was destined for service as the CSS McRae in the river defense fleet at New Orleans.[51]

Foreign Blockade Runners

Southerners were not the only ones who recognized the possibility for profitable trade through the blockade. Foreign merchants sent vessels to try the blockade as soon as they recognized its permeability. At first the ships were a

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[49] C.H.H., "Particulars of the Steamer Yorktown," Journal of the Franklin Institute, 68 (July 1859) p. 139; Admiral Raphael Semmes, Memoirs of Service Afloat During the War Between the States, reprint (Secaucus, New Jersey: The Blue and Grey Press, 1987), pp. 802-813; Captain William Harwar Parker, Recollections of a Naval Officer, 1841-1865 (Annapolis, Maryland: Naval Institute Press, 1985, reprint of 1883 ed.), pp. 223, 344-357, 365-366, 370-377; Silverstone, Warships of the Civil War Navies, p. 242.

[50] Semmes, Memoirs of Service Afloat During the War Between the States, pp. 93-94; Charles Grayson Summersell, The Cruise of the C.S.S Sumter, Confederate Centennial Studies, No. 27 (Tuscaloosa, Alabama: Confederate Publishing Company, 1965), passim.

[51] Morgan, Recollections of a Rebel Reefer, pp. 48-73; DANFS, vol. II, p. 548.

collection of many vessel types. Old or worn out vessels were the first choice of many owners as little would be lost if they were captured.

The "old, worn out" ships proved unsuitable for a variety of reasons and were gradually removed from the trade. Many were too slow, some were too visible, and a number drew too much water to enter the blockaded ports. Later, few ships were sent that were not fit for the demanding requirements of blockade running. Unsuitable ships did not pay.

The former Irish Sea cattle boat Despatch exemplifies the unsuitability of the early foreign vessels. She was sent by the Anglo-Confederate Trading Company to run the blockade early in 1862. Her supercargo realized that she was unsuited for blockade running after reaching Nassau. "The old Despatch," he said, "was much too slow to stand a chance of escaping them, moreover she drew so much water that the Charleston bar was the only one she could hope to get over, and it was now so strictly watched that a craft so unhandy was certain to be captured in the attempt." Despatch was sent home to England.[52]

The former Trinity House lighthouse tender Beacon was another unsuitable steamer. She was described as "small, rather slow and old" and "a dull sailer, and not answering well to her helm." To prepare Beacon to run the blockade she had new machinery put in that improved her speed to "fair." She left London for Nassau

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[52] Taylor, Running The Blockade, pp. 27-29.

in early January 1863, but returned a week later "somewhat damaged" for repair. She did not try again.[53]

Sailing vessels from the Caribbean were the first foreign vessels to violate the blockade. Fast schooners, sloops, and brigs from the Caribbean islands had developed along parallel lines with Southern types, and had the same advantages and limitations. They differed slightly in construction materials and proportions but had the same shallow draft and centerboards as small Southern vessels. Many schooners and sloops were built in the Bahamas and obtained British registry at Nassau. The numbers that engaged in blockade running are not known, but the majority had names that reflected illicit trade. Names such as Volant, Rapid, Southern Right, Clipper, Avenger, Pride, Young Republic, and Independens were registered at the Customhouse in Nassau during the war. Caribbean sailing vessels operated to Florida and the Gulf of Mexico throughout the war.[54]

Foreign Steam Vessels

Ship owners in Great Britain quickly recognized the chance to realise enormous profits from blockade running. A rush to buy existing fast shallow draft steamers ensued. Ship owners from other countries responded more slowly to the

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[53] F. H. Morse to W. H. Seward, January 23, 1863, no. 13; and January 29, no. 19, London Consular Despatches, RG 84, NA.

[54] Transcripts of Nassau, New Providence, Customhouse records, Eldredge Collection, The Mariners' Museum, Newport News, Virginia, passim.

possibilities. The ship types chosen for blockade running from British and Scottish merchant fleets were coastal and river steamers from the British Isles. The fastest of these were the passenger and excursion steamers from Glasgow and London shipyards built for service in protected waters such as the Clyde River. Other fast vessels came from the Irish Sea, North Sea, and English Channel routes, and were able to withstand heavier seas.[55]

British river passenger steamers were generally shallow-draft, iron-hulled, sidewheel vessels. Among those that became well known as successful blockade runners were Eagle, Denbigh, Mars, Gem, Juno, Rothesay Castle, Spunkie, Kelpie, and Giraffe, later renamed Robert E. Lee.[56] Robert E. Lee was described as: "a beautiful specimen of naval architecture, low and long and rakish, with a beatiful molded stern, and a bow as clean and sharp as a knife."[57] They averaged between 120 and 150 tons and had been well maintained.[58] The majority had little freeboard

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[55] Christian Leslie Dyce Duckworth and Graham Easton Langmuir, Clyde River And Other Steamers, 3rd ed. (Glasgow: Brown Son & Ferguson, Ltd., 1972), passim; Grahame Farr, West Country Passenger Steamers (Prescot, Lancashire: T. Stephenson & Sons, Ltd., 1967), pp. 198-206.

[56] Andrew McQueen, Echoes of Old Clyde Paddlewheels (Glasgow: Gowans and Gray, Ltd., 1924), pp. 127-147.

[57] Newspaper clipping, probably from Halifax, n.d., enclosure to despatch no. 42, M.M. Jackson to William H. Seward, 14, October 1863, Halifax Consular Despatches, RG 84, NA.

[58] Spy report enclosure to despatch no. 70, Freeman H. Morse to William H. Seward, June 19, 1863, London Consular Despatches, RG 84, NA.

and little protection for their machinery above the waterline. The large boilers usually were partially exposed above deck. With substantial strengthening, however, the river steamers made successful blockade runners, but had to be pampered, frequently staying in port in slightly inclement weather when other runners went to sea.

So many steamers were purchased that the Union consul in London reported that: "Nearly all the steamers fit for Confederate use and ready for service . . . have been bought up, sometimes to the seriuos inconvenience of the coast and continental trade. Very high prices have been paid for those lately purchased, sometimes about double their cost, after running two or three years." One of the consuls spys in Glasgow opined that: "The Confedertates will soon clean us out of all our available boats, but it will give trade to the builders."[59]

The river sidewheeler Eagle, 169.9-feet long, 16.5-feet in beam, and 8.3-feet in depth of hold, and registered at 92 tons, had been built in 1852. She was sold and sent to America. Eagle made six successful runs through the blockade between Nassau and Charleston before being captured coming out of Charleston. She was condemned by the prize court, sold, and renamed Jeanette. She was known as Jeanette when she operated on the Gulf Coast. Captain William Watson described his impression of the steamer in 1864. "I found her to be a sharp little steamer drawing a

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[59] Freeman H. Morse to William H. Seward, despatch no. 57, May 8, 1863, and enclosure to despatch no. 52, April 21, 1863, London Consular Despatches, RG 84, NA.

little over five feet of water when loaded; she seemed to have undergone much hard work. I found by her register that she had been built on the Clyde, and had plied in that river between Glasgow and Rothesay - her original name had been Eagle."[60]

Another Laird's river steamer, in addition to the prefabricated Chatham, became a very successful runner. Laird's shipyard in Birkenhead was recognized as a leader in constructing iron ships by 1860. The river steamer Denbigh carried passengers on the Mersey River until 1863 when she was sold, converted, and sent to challenge the blockade in the Gulf of Mexico. Denbigh became one of the most successful runners, making at least twenty-six successful runs through the blockade between Mobile, Galveston, and Havana. She ran aground trying to enter Galveston Bay, on May 23, 1865 and was destroyed.[61]

Coastal and cross-channel passenger steamers were also generally sidewheel propelled, but of slightly greater draft and with more freeboard. One large class of similar sister ships built by Caird & Company of Greenock, was sold by various owners at considerable profit and converted to run the blockade. The Wemyss Bay Company sold its three best steamers for blockade running and immediately

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[60] Watson, The Adventures Of A Blockade Runner, pp. 306-307; builders' model, 1:48 scale, at Museum of Transport, Glasgow; Wise, Lifeline of the Confederacy, pp. 297, 306; Mcqueen, Echoes, p. 132.

[61] "Ships Built By Cammell-Laird" typescript ship list in Cammell-Laird Archives, Birkenhead, England; Wise, Lifeline, p. 296; Time-Life Books, The Civil War: The Blockade, Runners and Raiders (Alexandria, Virginia: Time-Life Books, 1983), pp. 92-93.

contracted for replacement vessels from Caird on the same model. The replacement steamers were sold at a good profit for blockade running as well. Still later the vessels ordered to take the place of the replacement vessels were sold to go blockade running. Most of the vessels built by Caird during the war for Scottish steamship lines were ultimately sold for blockade running. The most famous Caird ship sold to run the blockade was Advance, the former Lord Clyde, sold to the State of North Carolina.

Caird & Company, of Greenock, began work as marine engineers early in the nineteenth century and began building ships in 1840. The company continued building ships until 1922, when they were amalgamated with Harland & Wolff. Caird's built small Clyde River steamers as well as large ocean-going steamships. The Cairds were reported to be "intimate with John Scott Russell," the leading naval architect of the day, and thus kept abreast of the leading edge of shipbuilding technology. The Caird ships converted to run the blockade were: Neva, built in 1853; Orion; and Sirius, later Alice, built in 1859. The ship that became most famous was A.D. Vance, originally Lord Clyde, built in 1862. Her register dimensions were 237.5 feet X 26.1 feet X 14.8 feet. The engine cylinders were 63 inches in diameter with a 6-foot stroke and could drive her at 17 knots. Other Caird runners were: City of Petersburg ex Roe (I) built in 1863. Nola; Alfred b)Old Dominion, Roe (II),(later Agnes E. Fry); Fox; Douglas, later Margaret and Jessie;

Mary & Ella; Hattie; and Herald were built in 1864. All were similar in measurement and several were built on the same model.[62]

The steam-powered cargo vessels of Great Britain and France in the early 1860s were mostly screw-propelled. Screw propellers were more efficient, if slower than sidewheels, and found considerable favor with ship owners. Many were too large for blockade running, drawing too much water to enter most ports. They also drew too much attention, and required large amounts of cargo to fill and time to unload. A few, notably Modern Greece, Bermuda, Bahama, and Economist, were tried as blockade runners but were either lost or transferred to other activities such as supplying the island entrepots.

Foreign Steam-Auxiliary Sailing Ships

Steam-auxiliary sailing vessels, including a new group of experimental steam-auxiliary clipper ships, were capacious and fast enough to evade blockaders but had significant disadvantages. Most drew too much water to consider entering Southern ports; all were big and highly visible.[63] The principal advantage to the steam-auxiliary sailing ships was that they could sail in favorable winds and steam when the wind was against them. Most steam-auxiliary steam vessels had screw propellers

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[62] Fred M. Walker, Song of the Clyde: A History of Clyde Shipbuilding (New York: W.W. Norton, 1984), p. 351; Wise, Lifeline of the Confederacy, passim.

[63] P.W. Brock and Basil Greenhill, Steam and Sail: In Britain and North America (Princeton, New Jersey: The Pyne Press, 1973), p. 15.

equipped with lifting screws. When sailing the propeller was hoisted free of the water. Lifting screws reduced drag and maximized performance under both sail and steam.[64]

Steam-auxiliaries were more suited for wartime use as commerce raiders than as blockade runners. The ships could sail when searching for prizes, steam when chasing or being chased and were generally fast enough to catch any weaker prey or evade more powerful predators. The Confederate cruisers Alabama and Florida were modifications of this type; CSS Shenandoah was converted from the Australian steam-auxiliary clipper Sea King.[65] Federal consuls and spies closely scrutinized such ships fearing their conversion into Confederate commerce raiders.[66]

Conversion For Blockade Running

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[64] N. P. Burgh, "A Description of Modern Screw-Propellers Constructed By The Most Eminent Marine Engineers of England and Scotland" in N. P. Burgh, ed. A Practical Treatise on Modern Screw-Propulsion, pp. 129-140; Norman Rivett, The Naval Steam Reciprocating Engine (Garden Island, New South Wales: The Naval Historical Society of Australia, [1989]), pp. 17-18; Andrew Lambert, Battleships in Transition, The Creation of the Steam Battlefleet, 1815-1860 (Annapolis, Maryland: The Naval Institute Press, 1984), p. 59.

[65] John L. Carvel, Stephen of Linthouse: A Record of Two Hundred Years of Shipbuilding, 1750-1950 (Linthouse, Glasgow: Alexander Stephen and Sons, Ltd., 1950), pp. 45-46; MacGregor, Fast Sailing Ships, pp. 247-252.

[66] Freeman H. Morse to William H. Seward, January 28, 1863, London Consular Despatches, RG 84, NA.

The river and coastal passenger and cargo vessels sold for blockade running were converted in the yards of Great Britain to prepare them for their intended service. River steamers, in particular, needed major conversion work. Their light hulls were not designed to survive heavy seas. Hulls were strengthened; turtleback or forecastle decks built; bulwarks and rails were reinforced; machinery was overhauled; cabins stripped; bunker capacity increased; and outfitting completed for service in tropical climates.

As an example, the Kelvinhaugh, Glasgow shipyard of Alexander Stephen converted several existing vessels into blockade runners on their slipway. The sidewheeler Juno was altered to "run the blockade off Charleston," for which the yard charged 615 pounds. The runners Condor and Stettin were painted on the Stephen slip.[67]

Captain John Wilkinson described the conversion of the Clyde River passenger steamer Giraffe into the Confederate blockade runner R.E. Lee. "Her beautiful saloon and cabins were dismantled and bulkheads constructed to separate the quarters for officers and men from the space to be used for stowage of a cargo."[68]

Another runner captain described the conversion of the Clyde steamer Eagle, b) Jeanette, a Clyde River passenger steamer, in more detail. He noted:

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[67] William Leitch, "Kelvihaugh Slip Dock and Shipbuilding Yard" Linthouse Works Magazine, September 1920, pp. 9-12; Alexander Stephens, Scribbling Diary, April 23, July 28, 1863, August 3, 1864, University of Glasgow Archives, Glasgow, Scotland.

[68] Wilkinson, Narrative of a Blockade Runner, p. 106.

> She was considerably altered in her interior arrangements. Her passenger saloon was converted into an after-hold, her stewards' refreshment rooms into a forehold, the small ladies' cabin aft was now used as a cabin for the officers, and the steerage forward as a forecastle for the crew. The after part of the paddleboxes were stripped of the planking, to allow the water to go free from the paddles in the heavy seas. She was considered a pretty swift vessel, but owing to a number of tubes in her boilers being at the time shut off, her steaming power was somewhat reduced. She had what is called a haystack boiler standing high above her deck, an oscillating engine, and her light draft of water made her very suitable for running the blockade into Galveston. It was therefore desireable that her boilers should be retubed, and the vessel got ready for business without delay.[69]

Vessels adapted or purchased to run the blockade performed a valuable service for the Confederacy. Once the requirements of the trade became known, suitable vessels were found on the coasts and rivers of both the South and Great Britain. But the requirements were many and complex: it would take time and toil to determine the best features for blockade running. Only specially built ships could hope to meet all of the requirements.

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[69] Watson, Adventures of a Blockade Runner, pp. 306-307; letter from William H. Dabney to WIlliam H. Seward, January, 1863, Teneriffe Consular Despatches, RG 84, NA.

Chapter III: DESIGN REQUIREMENTS FOR BLOCKADE RUNNERS

Blockade running steamships required the utmost from their builders and their operators. The design of these special craft required time, experience, and considerable effort to mature. A complex mixture of characteristics had to be integrated to produce a successful design. Numerous compromises must be made in all ship designs between desirable but sometimes contradictory characteristics. The builders and owners of blockade runners were forced to use extreme designs to answer the extreme requirements of the trade. By the middle of 1862 the required performance parameters were known; naval architects and shipbuilders began to produce designs to meet the needs.

A successful blockade runner required high speed to outrun blockaders; camouflage to pass them unseen, or deception to confuse them; shallow draft to allow entry into Confederate ports; seaworthiness and maneuverability to allow evasion of ordinary marine hazards as well as those of the blockade; and a large cargo capacity to get the largest return for the risk. James Russel Soley called the requirements "speed, invisibility, and handiness, with a certain space for stowage."[1]

Shoal Draft

[1] Soley, The Blockade And The Cruisers, pp. 156-157.

The waters of the southern coast are shallow and ever changing; the harbors of the Confederacy that were open to blockade runners had sand bars guarding their entrances, which required potential blockade runners to be of very light draft. Runners had to draw less than twelve feet for Wilmington and Charleston, ten feet for Mobile, and under seven feet for Galveston. Several of these ports possessed deeper main channels that could not be used safely because they led through the middle of the blockade fleet. A few runners were even built to run into very shallow Gulf and Atlantic coast inlets with less than five feet of water. The very shallow draft runners thus evaded the dangers of the close blockade entirely.[2]

Because of the ever-present danger of running aground on the shallow southern coast, blockade runners were built to extricate themselves from shoals if necessary. The coast with shallow water affected the design of hull, machinery, and fittings, as well as determined operations to a great degree. Due to the great danger of captured blockade violators being used to run down other runners, vessels were destroyed if they ran aground to prevent reuse by the enemy. This led to a need for swift extrication from shoals or the destruction of the vessel.

Many runner hulls had no projecting external keel due to the danger of becoming stuck if they ran aground. A flat iron or steel plate served as the attachment point for the hull shell plates and presented little surface to hold the vessel

[2] Plans of Little Ada, William Simons & Co. Collection, University of Glasgow Archives, Glasgow, Scotland; Watson, Adventures of a Blockade Runner, p. 300.

on shoals. Projecting keels, useful in sailing vessels to give "a grip on the water" and allow progress against the wind, were not as necessary on steamships. On steam-propelled runners, sails were used more to steady the vessels' motion rather than for propulsion. The usual function of the projecting keel became detrimental rather than beneficial, so it was omitted.[3]

Some officers favored paddlewheels over screws, believing that sidewheelers were easier to extricate from shoals when grounded. Twin-screws could sometimes be worked alternately to twist a runner off a shoal. Single-screw runners were so difficult to free from shoals that there was often no recourse other than to destroy the ship.[4]

Both paddle and screw propeller vessels kept kedge anchors at the ready at the bow and stern in case of grounding. If the ship ran aground, a boat carried the anchor away from the ship. The capstan at the bow added to the power of the engines to try to wrench the ship free. Many runners also had small extra capstans aft to help in such an occurrence.[5]

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[3] Edward J. Reed, Shipbuilding In Iron And Steel (London: John Murray, 1869), p. 50.

[4] Watson, Adventures of a Blockade Runner, pp. 300-302.

[5] "Specifications of Iron Paddle Steamers" Ella, Caroline, and Emily, William Denny and Company Collection, University of Glasgow Archives, Glasgow University; James M. Merrill, "Strangling the South," William C. Davis, ed. The Embattled Confederacy: The Image of War, 1861-1865, Vol. 3, (Garden City, New Jersey: Doubleday & Company, 1982), p. 119, photo of Dee showing capstan mounted on the quarterdeck.

High Speed

Blockade runners required high speed. A combination of many features was required for high speed.

Steamship design had progressed to a point by the Civil War where the fastest steamers were capable of greater speeds than the fastest sailing ships. Tales of river and sound steamers topping fifteen knots abounded on both sides of the Atlantic. The large steamships of the Collins Line, Cunard Line, and Compagnie General Transatlantique regularly made passages across the North Atlantic in much shorter times than sailing ships. Among the sailing ships, only the China tea clippers held their own against the steamers in speed.[6]

Steam vessel hull designs were not as narrowly restricted in form as were those of sailing vessels. Sailing vessels needed to sail well in a variety of wind and sea states. Steamers were free of that requirement, except in a few trades where auxiliary sailing rigs were needed to augment steam power. Steamers could thus be built with more extreme proportions and finer lines than sailing vessels. Since longer ships generally sailed faster than shorter ships, steamers possessed a natural speed advantage over sailers.[7]

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[6] Cedric Ridgely-Nevitt, American Steamships on the Atlantic (Newark: University of Delaware Press, 1981), pp. 347-348; Richard C. McKay, Some Famous Sailing Ships and Their Builder Donald McKay (New York: G.P. Putnam's Sons, The Knickerbocker Press, 1931), p. 301.

[7] MacGregor, Tea Clippers, p. 86.

Fast Hull Forms

Southern shipbuilders had built fast, light-draft sailing vessels since the days of the colonies. The most famous type developed between 1780 and 1830 was identified with the port of Baltimore. Called Baltimore clippers, these sharp-lined schooners and brigs were employed as privateers, slavers, pirates, and naval warships for over 50 years. The shoal draft version with centerboard became popular in the 1830s, and remained so into the 1860s.[8]

Fast sailing yachts were also being developed in the United States in the 1850s. In 1851, the American clipper yacht America beat all contenders in the race for what became known as the America's Cup. America herself became a blockade runner. She ran under the name Camilla from Savannah to Liverpool in 1862, carrying Confederate government agents. Later she ran between Florida and the Bahamas, before being scuttled in the St. John's River.[9]

No American or British sailing clippers appear to have run the blockade.[10]

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[8] Howard Irving Chapelle, The Baltimore Clipper (New York: Bonanza Books, n.d., reprint of 1930 ed.), p. 148 and passim.

[9] Hoole, ed., Confederate Foreign Agent, pp. 17-21.

[10] None of the ships or barks listed by Marcus Price in his articles in the American Neptune match any clippers mentioned in Basil Lubbock, The China Clippers (Glasgow: Brown, Son and Ferguson, Ltd., 1981); or The Opium Clippers (Glasgow: Brown, Son and Ferguson, Ltd., 1976); MacGregor, Fast Sailing Ships or The Tea Clippers; Octavius T. Howe and Frederick C. Matthews, American Clipper Ships, 1833-1858 (New York: Dover Publications, reprint ed., 2 vols., 1986); Arthur H. Clark, The Clipper Ship Era: An Epitome of Famous American and British Clipper Ships, Their Owners, Builders, Commanders, and Crews, 1843-1869 (Riverside, Connecticut: 7 C's

Clipper ships were predominantly a Northern business, and although many Northern men participated in running the blockade, few ship owners did so. Clipper ships were expensive to risk in the huge gamble of blockade running.

The naval architects of Great Britain also sought to produce fast ships. Alexander Hall of Aberdeen, Scotland, developed a fast hull form for sailing vessels during the 1840s and 1850s. Called "Aberdeen Clippers," they had a very sharp, straight bow raking strongly forward, calling for the foremast to be farther aft than usual. At least one single-screw blockade runner, Little Ada, was built with an Aberdeen hull form. She was successful but was too small to carry the large cargoes required to earn great profits and few more of her type appear to have been tried.[11]

The scientist and naval architect John Scott Russell, a leader among the engineers of the industrial revolution, also built a fast ship tested on the blockade. One of Russell's contributions was the *wave line* theory of hull design. The wave line theory related the length and shape of a ship's hull to the waves formed by the hull. This was the first explanation of ideal hull form that took wave formation into account. By designing the hull to produce only a single wave crest along its length, an efficient hull form was produced. Wave Queen, built to test the theory, was a

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Press, 2nd rev. ed. 1970); or Howard Irving Chapelle, The Search for Speed Under Sail, 1700 - 1855 (New York: W.W. Norton & Co., 1967; reprint ed., New York: Bonanza Books, n.d.).

[11] Manuscript drawings of Little Ada, William Simons Collection, Glasgow University Archives, Glasgow, Scotland.

"small steamer, 113 tons, of very great length and very narrow" with sidewheels driven by a 120 horsepower engine. Lack of cargo capacity probably accounted for the lack of imitators.[12]

London shipbuilder Joseph Maudslay's *rising lines* theory was the most widely accepted idea for the best fast hull form. Most naval architects believed that water was cleaved to each side of the bow and closed in again from below at the stern. The theory was applied to maximize the performance of each area. Waterlines at the bow and entrance were made as long and easy as possible with no perceptible shoulder. The greatest breadth of the vessel at the waterline was aft of the center of length. The greatest breadth of the lower waterlines was placed ahead of the center of length.[13]

William J. Rankine, another leader in ship design, improved the theoretical understanding of the increased speed granted by increased length-to-beam ratios and the effect of skin-resistance on speed. Rankine realized that friction between the hull and surrounding water slowed a ship in proportion to the surface area for a given displacement. Less hull surface area meant less skin-resistance and a faster vessel.

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[12] W.H. Dabney to W.H. Seward, December 14, 1862, Teneriffe Consular Despatches, RG 84, NA; John Scott Russell, "The Wave-Line Principle of Ship-Construction," Transactions of the Institution of Naval Architects and Marine Engineers, Parts I-III, Vol. 1, (1860); Sir Westcott Abell, The Shipwright's Trade (London: Conway Maritime Press, 1961), pp. 120-126; David R. MacGregor, Merchant Sailing Ships, 1850-1875, Heyday of Sail (Annapolis, Maryland: Naval Institute Press, 1984), p. 236.

[13] Joseph Maudslay, "An Improvement In The Form Of Ships," in Transactions of the Institution of Naval Architects, Vol. I (1860), pp. 54-56.

Rankine figured that the most efficient hull proportions for a fast vessel were a length-to-breadth ratio of about seven to one, but if shallower draft was required hulls would have to increase the length in proportion to breadth.[14]

Blockade running steamships, designed primarily for speed, had a natural advantage over warships, which were designed to carry and use a heavy armament. The fastest United States naval vessel built prior to the Civil War, the USS Kearsarge was reported to have a top trial speed of about thirteen knots. The fastest Northern warship begun during the war, the "super-cruiser" Wampanoag, achieved a trial trip speed of 17.75 knots, but so damaged her engines in achieving the record that she was laid up shortly thereafter.[15] The Union consul at Bristol reported that the blockade-bound iron sidewheeler Alfred had made twenty knots on her trial trip.[16] The fastest blockade runner trial trip recorded by a shipbuilder was 20.45 knots (or

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[14] William J. Macquorn Rankine, "On The Proportions of Ships of Least Skin-Resistance For A Given Speed And Displacement," The Artizan (September 1, 1863), p. 200; "On the Computation of the Probable Engine Power and Speed of Proposed Ships," Transactions of the Institution of Naval Architects, Vol. V, (1864), pp. 316-333.

[15] Augustus C. Buell, The Memoirs of Charles H. Cramp (Philadelphia: J. B. Lippincott Company, 1906), pp. 90-92; Bennett, The Steam Navy of the United States, pp. 554-568; Donald L. Canney, The Old Steam Navy: Frigates, Sloops, and Gunboats, \815-1885 *(Annapolis, Maryland: Naval Institute Press, 1990), pp. 75, 142.*

[16] As quoted in Farr, West Country Passenger Steamers, pp. 203-204.

23 and one-half knots) for Presto.[17] Reports of blockade runner trial trips exceeding fourteen and fifteen knots were common.

By the late 1850s fast steamships were being built to more extreme proportions than fast sailing ships. Through experiment it was known that longer ships could travel faster than shorter ships of the same tonnage. Speed could be further augmented if the beam were reduced as well. The most extreme sailing vessels of the antebellum period were built with length-to-beam ratios of around six-to-one, the range of the most conservative steam vessels. The coastal steamboats of Harlan and Hollingsworth were designed relatively conservatively with length-to-beam ratios of six or seven to one. British passenger steamers bought for the blockade running trade were seven to ten times longer than they were broad. Most of the steamers built for blockade running averaged a length-to-breadth ratio of nine or ten to one. A few approached twelve to one.[18]

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[17] The Engineer, September 4, 1863, p. 150; David R. MacGregor, "Tendering and Contract Procedure in Merchant Shipyards in the Middle of the Nineteenth Century," The Mariner's Mirror Vol. 48, No. 4 (November 1862), p. 259; J. Simon Holland, "Table V. - Knot and Mile Table," The Office and Cabin Companion, For Engineers and Officers of Steam Vessels (London: Atchley and Co., 1861), p. 63; "Table 20, Conversion Table for Nautical and Statute Miles," in Nathaniel Bowditch, American Practical Navigator, An Epitome of Navigation (Washington, D.C.: U.S. Government Printing Office, 1958), p. 1276.

[18] Length to beam ratios were derived from Marcus Price, "Ships that Tested the Blockade of the Carolina Ports, 1861-1865," American Neptune, 8 (April 1948), pp. 196-241; idem, "Blockade of the Gulf Ports," pp. 52-59, pp. 154-161, pp. 229-238; idem, "Ships That Tested the Blockade of the Georgia and East Florida Ports, 1861-1865," American Neptune, 15 (April 1955), pp. 97-132; Wise, Lifeline Of the Confederacy, pp. 285-328.

The theories of leading naval architects, coupled with the well-known need for a smooth entrance, easy run, and a smooth hull surface, produced some fast ships designed to be blockade runners.

Hull and Superstructure Construction

Lightweight hull structure allowed more room for cargo and made higher speeds possible. The use of iron hulls for ocean-going steam vessels had been increasing since the middle 1840s. Iron-hulled vessels were much lighter and roomier inside as well as stronger than wooden ships. Iron hulls were also more rigid, suiting them to propulsion by steam engines whose vibrations loosened fastenings in wooden vessels.

To lighten hulls for high speed, scantlings were reduced to - and sometimes below - the bare minimum for seaworthiness. Several runner logbooks tell of their minimal seaworthiness. Talisman foundered at sea off Bermuda "as no mortal could have saved her."[19] Julia was captured on the coast of South Carolina after putting into shore for repairs. Her topgallant forecastle and forward bulwarks had been stove in by heavy weather.[20] Will o' the Wisp was "shamefully put together, and most

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[19] "On Board Schr. 'Orville,'" and "The Steamer 'Talisman,' Foundered," Royal Gazette, Bermuda, Jan. 3, 1865.

[20] Report of Rear Admiral John Dahlgren to Gideon Welles, December 30, 1864, with enclosure of December 25, 1864, report from William Barrymore, ORN, ser. I, vol. 16, pp. 143-145.

fragile." Twice she arrived at Nassau leaking so badly that the engines had to be kept going to run the pumps to keep her from sinking.[21] The sidewheeler Whisper lost her boats and had the wheelhouses stove in by a gale.[22] The steel-hulled Banshee was so damaged by a gale that she had to put back for extensive strengthening of her lightly-built hull before completing her first voyage to America. Her scantlings were only about one fourth of the minimum required for iron vessels. Lloyd's Committee required that the scantlings of steel built vessels be no less than three-fourths the size of those built of iron.[23]

At least a half-dozen lightly built, potential blockade violators never made it across the Atlantic. The Scottish river steamer Iona(II) foundered in a gale while on her voyage out to attempt the blockade.[24] One spectacular foundering, that of the sleek sidewheel steamer Lelia off Liverpool bar, was graphically depicted in the

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[21] Taylor, Running the Blockade, pp. 101-102, 107-108.

[22] Wilkinson, Narrative of a Blockade Runner, pp. 191-192.

[23] Taylor, Running the Blockade, pp. 35-36; Edward J. Reed, Shipbuilding in Iron and Steel (London: John Murray, 1869), pp. 404-427.

[24] Farr, West Country Passenger Steamers, p. 198.

Illustrated London News.[25] Several lucky ships managed to return safely to shipyards for hull repairs and strengthening.[26]

One daring innovation in hull construction was to build ultra-light hull structures of steel in place of iron. Prior to the Civil War, steel had been used in only one vessel hull: the small exploring steamer Ma Robert, built in 1858 for the African adventurer Henry Morton Stanley. Steel was stronger than iron so thinner plates and lighter frames were used in construction.[27]

Two pioneering blockade running vessels, Phantom and Banshee, were built of steel at Liverpool over the winter of 1862-1863. One was the sharp-lined single-screw runner Phantom, built by William C. Miller & Sons. She took longer than Banshee to construct, proved not to be not quite as fast as expected, but was a successful runner nevertheless. Phantom's hull was built entirely of steel.[28]

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[25] "Lelia Foundering," Illustrated London News, Supplement (January 28, 1865), pp. 93-94.

[26] "The Double Disaster at the Mouth of the Mersey," Illustrated London News, Supplement (January 28, 1865), pp. 93-94; Iona(II) foundering in Farr, West Country Passenger Steamers, p. 198; Banshee hull problems in Taylor, Running the Blockade, pp. 35-36.

[27] H. Philip Spratt, "The First Steel-Hulled Atlantic Steamers," The Nautical Magazine, 170 (October 1953), pp. 213-215.

[28] Gustav Hillman, "Scraubendampfer von 170 Pferdkraft Gebaus mit Stehlplaten," manuscript plans of Phantom, signed G. Hillman, Liverpool, 1862, Webb Institute Collection, The Mariners' Museum Archives, Newport News, Virginia; Wise, Lifeline of the Confederacy, p. 316.

The extremely sharp, sidewheel steamer Banshee was finished before Phantom. Built in the yard of Jones, Quiggin & Company, Banshee had steel plates over iron frames. After initial problems caused by overly light hull plating were solved, she became the first steel vessel to cross the Atlantic. Banshee, 214 feet long, was built of steel plates only 1/8 inch and 3/16 inch thick.[29] Banshee's success was instrumental in securing orders for twenty-eight more blockade runners from the company.

After Banshee proved herself, several more steel paddlewheel runners were built on the Mersey. A few runners built in Glasgow also included steel in their construction. The uncertain quality and very high cost of the material, however, did not encourage its general adoption by most shipbuilders of the time. The pioneering steel ships were reported on extensively by technical journals and books.[30]

High speed required a smooth hull surface in addition to fast lines and powerful engines. Marine organisms constantly attacked ship hulls in tropical waters, attaching themselves, and growing rapidly. This growth of seaweed and barnacles, called fouling, greatly reduced the speed and power of ships. The traditional method

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[29] Morrison, Iron and Steel Hull Steam Vessels, p. 19; Sprunt, Derelicts, p. 66-67; Taylor, Running The Blockade, pp. 35-36.

[30] For just two of many examples see William Denny, "On Steel in the Shipbuilding Yard," Transactions of the Institution of Naval Architects, 21 (1880), p. 185; Reed, Shipbuilding in Iron and Steel, pp. 50, 324. For the advantages of steel as well as the uncertain quality of early steel see J.J. Welch, A Text Book of Naval Architecture for the Use of Officers of the Royal Navy (London: Her Majesty's Stationery Office, 1889), pp. 70-73.

for preventing the fouling of wooden ships was to sheath the hull in sheets of copper. The copper was poisonous to such marine organisms and exfoliated as the vessel sailed, releasing attached barnacles and grass. Iron and steel ships could not use copper sheathing because it prompted a cathodic reaction that rapidly corroded the hull.[31]

Ships built of iron and steel required anti-fouling paints. The anti-fouling coatings had to be applied every few months in a drydock or marine railway to maintain the smooth hulls needed to attain high speed. Unfortunately no more better method was found at the time.[32] The first effective anti-fouling preparations were developed during the period of the American Civil War. One of these, made by Peacock and Buchans, was widely used on the hulls of blockade runners. A dull pink color, it is represented on every known contemporary blockade runner model as well as in several paintings.[33]

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[31] MacGregor, Fast Sailing Ships, pp. 142-143; Welch, Naval Architecture, pp. 68-69; Samuel J. P. Thearle, The Modern Practice of Shipbuilding in Iron and Steel, vol. I, 2nd ed., (London: William Collins, Sons, & Company, 1886), pp. 237-238.

[32] L. Daft, "The Construction And Sheathing of Iron Ships," The Artizan (February 1, 1866), pp. 35-36; Welch, Naval Architecture, p. 151; Watson, Adventures of a Blockade Runner, p. 236; MacGregor, The Tea Clippers, p. 86.

[33] The pink color of Peacock and Buchan paint is visible on models at the Transport Museum, Glasgow; Merseyside Maritime Museum, Liverpool; model of Rosine and Ruby, private collection, Charleston, South Carolina; oil painting of many runners at Bermuda, Circa 1864, at Confederate Museum, St. Georges, Bermuda; lithograph of Nassau, circa 1864, at The Mariners' Museum, Newport News, Virginia.

Blockade running vessels were docked, cleaned and painted before attempting the blockade: some vessels were cleaned before each run. Coquette was alternately scraped and painted on a marine railway, or careened and scraped by divers.[34] A captain said, "this was one of the chief advantages that the blockade runners had over the cruisers - oftener docked."[35]

The speed of ships can be affected by their design above water as well as below. Most runners were built with a minimum of top hamper to provide no impediment for waves. Many were also equipped with turtleback forecastle decks. Yet again, blockade runners sacrificed comfort and safety for speed. Ships with flared bows lost speed in heavy seas when the bow plunged down into a wave and was brought up short. Without flare, the bows plunged deeply into or through waves and scooped up quantities of green water. Most ships had to slow down to prevent taking aboard much water in heavy seas. To avoid slowing down in heavy seas many blockade runners were fitted turtleback decks.

Turtleback decks were lightly constructed, arched deck covers built over the forecastles of many blockade runners. The turtleback label came from the appearance of the curved deck. The turtleback shed green water without allowing it on deck, permitting runners to maintain speed and drive through seas that would have forced

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[34] Manuscript Logbook of Steamer Coquette, John Welborn, Commanding, February 22-25, February 29, March 16. April 21-28, May 16-17, 1863, Records of Captured and Abandoned Property, Record Group 56, National Archives, Washington, D.C.

[35] Watson, Adventures of a Blockade Runner, p. 294.

ships without turtlebacks to slow down. A few runners were built with turtleback decks at both the bow and stern, or even over the entire length of their weather decks.[36]

Paintings, plans, and models of steam blockade runners show three types of stern deckhouses. The most common deckhouse arrangement had one or two traditional houses on deck near the stern. Several runners were built with an Aberdeen house. Such ships had cabins built into a raised half-deck at the stern. This allowed a larger cabin over the fine-lined stern and left more area in the hold for cargo. A third deckhouse type, called a half-round, had a top that curved down to the sheer line in a manner similar to turtlebacks.[37]

Great Power

The development of steam engines for fast vessels required considerable experimentation and innovation. In spite of the many variations in engine design details only a few basic engine types were built for blockade runners. Prior to the Civil War, paddlewheel merchant ships were usually built with only four types of

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[36] Despatches of William H. Dabney to William H. Seward, describing the blockade runners Juno, May 29, Red Jacket, September 23, and Wild Dayrell, December 7, 1863, Havana Consular Despatches, RG 84, NA; Soley, The Blockade And The Cruisers, p. 157; Wilkinson, Narrative of a Blockade-Runner, pp. 86, 87; Peter Smith, Hard Lying: The Birth of the Destroyer, 1893-1913 (Annapolis, Maryland: Naval Institute Press, 1971), pp. 22-23.

[37] Plans of Fergus and The Dare, Alexander Stephens plan collection, National Maritime Museum, Greenwich, England; MacGregor, The Tea Clippers. pp. 46, 169.

engine. The paddlewheels were driven by walking-beam; side-lever; inclined, direct-acting; and oscillating engines. Walking-beam engines were the most common engine type in American coastal vessels and oscillating engines were the most common engine type in British coastal and river passenger steamers.[38]

The engines of most screw-propeller merchant vessels were of two variations on the direct-acting engine. The most common were horizontal engines, although vertical-inverted, direct-acting engines were gaining favor in the early 1860s. Vertical-inverted engines were easiest to maintain, but suffered from a vulnerability to gunfire because of their height above the waterline.[39]

All of the engines used in blockade runners were single-expansion engines; successful compound engines were built as early as 1854 but multiple-expansion engines did not become common until the 1870s. Where more power was needed, engines were given larger cylinders or were paired up on the same drive shaft; most

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[38] Thomas J. Main and Thomas Brown, The Marine Steam Engine (London: Longman, Brown, Green and Longmans, 1860), pp. 153-154 and passim; Bob Whittier, Paddle Wheel Steamers and their Giant Engines (Duxbury, Massachusetts: Seamaster Boats, Inc., Book Division, 1983), pp. 5-15, 43.

[39] Main and Brown, The Marine Steam Engine, pp. 154-156 and pp. 234-235; Two Centuries of Shipbuilding By the Scotts of Greenock, 3rd ed. (Manchester: W. Hopwood & Company, Ltd., 1950), pp. 40-47; H. Philip Spratt, Handbook of the Collections Illustrating Marine Engineering (South Kensington, London: Science Museum, n.d.), passim; Handbook of the Collections Illustrating Merchant Steamers and Motorships (South Kensington, London: Science Museum, n.d.), passim.

sidewheelers were driven by a pair of oscillating cylinders and most twin-screw steamers by side-by-side pairs of horizontal cylinders.[40]

Boilers had many different designs, but most had large flues to allow fire and exhaust gasses to pass through water in the boiler. A few boilers used many small tubes to expose more surface area for heat exchange. The most advanced boilers of the day were water tube boilers, which ran water in tubes through the exhaust gasses. Debate over the merits of various types raged in technical journals of the day. Several related problems had to be solved before the merits of one type became clear. Although blockade runners used boilers of every imaginable form, operators preferred low-pressure boilers that were placed low in the hull for protection from shot. Low pressure boilers were considered more manageable and less dangerous in case of an accident. The only recorded boiler explosion on a blockade runner happened on board Stormy Petrel at Bermuda in November 1864.[41]

In all but the converted riverboat runners, steam produced by the boilers traveled to the engines and then to condensers before returning to the boilers. Marine engineers were uncertain which of the two types of condenser then in use was better. Surface condensers allowed a fuel savings of about ten percent over jet condensers

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[40] Edgar C. Smith, A Short History of Naval and Marine Engineering (Cambridge: Babcock and Wilcox, 1937), pp. 174-181; Maber, Channel Packets and Ocean Liners, pp. 13-21; Wise, Lifeline of the Confederacy, passim.

[41] Thomas Savage to W.H. Seward, despatch no. 221, November 14, 1864, Havana Consular Despatches, RG 84, NA; Smith, Short History of Marine Engineering, pp. 133-134.

and required less frequent cleaning. Jet condensers led to longer boiler life but were less efficient. Most blockade runners employed surface condensers; the savings in maintenance time and increased efficiency were more important than the prospect of early replacement of boilers. Some of the high-seas vessels and many older vessels that ran the blockade were fitted the less sophisticated jet type.[42]

Boilers producing large amounts of steam needed to maintain thorough, even fires when steaming. To accomplish this, fuel and air had to be present in the right proportions. For hotter fires, greater draft, or air flow, was needed. All runners employed either tall or large diameter funnels to increase the amount of air flowing over the fires. Tall funnels created a faster flow; wide funnels created a slower, but larger mass of air. Air flow could also be increased from the other end. Several blockade runners used forced draft to provide more air for combustion in the firebox. The forced draft system, which later became standard, first appeared on ships on both sides of the Civil War in 1862.[43]

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[42] Robert Murray, "Some Recent Experiences In Marine Engineering," in Transactions of the Institution of Naval Architects, vol. VI (London: Institution of Naval Architects, 1865), pp. 158-162.

[43] For a general description of natural and forced draft see Holland, The Office & Cabin Companion, p. 89. For mentions of forced draft aboard blockade runners see The Engineer (December 4, 1863), p. 334; (July 3, 1864), p. 8; (February 19, 1864), p. 120; The Artizan (October 1, 1863), p. 237. For mentions of forced draft aboard U.S. Navy vessels see Canney, The Old Steam Navy, passim; Gordon P. Watts, Jr., Investigating the Remains of the U.S.S. Monitor Report: A Final Report on 1979 Site Testing in the Monitor National Marine Sanctuary (Fort Pierce, Florida: Harbor Branch Foundation, 1981), p. 6.

One manner of achieving high speed was through powerful machinery. A few vessels resorted to large boiler capacity and powerful engines, most notably Falcon, Flamingo class built by Randolph, Elder & Co. of Fairfield, England. Three vertical water-tube boilers were used to provide steam. Vertical fire tube boilers allowed the steam only one pass through the boiler water on its way to the funnel above. They could raise steam quickly, but were inefficient, and difficult to manage. Several of these extremely fast vessels had problems when the powerful engines dismounting themselves in the lightly-built hulls.[44]

Different approaches were tried to achieve high speed, low weight, and reliable, efficient operation. The alternative to huge engine power was light construction so that the machinery had less work to perform. Lightweight engines and boilers in a lightweight hull could be pushed faster and were less expensive to build and operate. The sidewheel passenger steamer Mars, built in 1849, was an example of that form of thinking. She had lightweight machinery and ran the blockade at least twice before returning to Scotland.

The proper machinery construction was not enough to ensure high speed. Ships' engineers resorted to extreme measures to achieve greater speed. Both the boilers and engines had to be carefully treated when possible but worked to capacity at times. Boilers were made to produce hotter fires, more steam, better draught for

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[44] Watson, The Adventures Of A Blockade Runner, p. 287; William T. Minor to W. H. Seward, No. 47, February 24, 1865, Havanah Consular Despatches, RG 84, NA.

the fires, preheated water, and superheated steam for the engines. The Chief Engineer on board Mary Celestia stated the classic problem after loading his boiler safety valve with a kedge anchor:

> Captain, I am getting all the revolutions possible out of the engines. I am following steam full stroke; this is a new ship, first voyage; these boilers are, I hope, good English iron. **All there is now between us and eternity are these boilers.** How much steam there is on them I do not know.[45]

Boilers designed for higher pressure steam were fitted in some vessels despite misgivings about them. High pressure was thought to be more dangerous. Popular fears were that higher pressures caused more boiler failures and were more deadly when they exploded. Blockade runner builders employed caution in that existing, experimental very high pressure power plants were not applied to blockade runners.[46]

Warming the water fed to the boiler improved boiler efficiency. Feed-water heaters were developed in a simple form for blockade runner boilers. J.& W. Dudgeon's patent annular feed-water heater was one popular version. Dudgeon's device heated water by holding it in a tank that surrounded the bottom of the exhaust

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[45] Usina, Blockade Running In Confederate Times, pp. 28-29.

[46] These boilers designed by J.M. Rowan reached 115 lb. per square inch. Spratt, Marine Engineering, pp. 78-79; (Scotts) Two Centuries of Shipbuilding, p. 14; Brock and Greenhill, Steam And Sail, passim.

funnel. The annular tank was fitted with baffles to transmit heat to the water before it entered the boiler.[47]

Engine efficiency could be improved by superheating steam bound for the boilers. Steam in a few runner boilers passed through the boiler twice. Other vessels used superheaters fitted around the boiler exhaust uptakes to superheat the steam bound for the boilers. Several large runners built by Jones, Quiggin and engined by James Watt & Company, such as Abigail, were fitted with exhaust uptake superheaters. This promoted additional heat exchange, giving a moderate amount of superheating to the steam bound for the engines.[48]

Superheated steam, although more efficient, was not practical for use at the time. Dissolved tallow used for lubrication often contaminated boiler water. Contaminated water damaged boilers by building up inside boiler tubes, lowering efficiency, forming corrosive compounds that attacked tube walls, and promoting energy-wasting foaming of boiler water, called "priming." One shipbuilding firm, J.& W. Dudgeon, tried to superheat steam bound for the engines with an extra boiler. The firm built their first ship, Flora, with an experimental high-pressure boiler to

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[47] Burgh, Modern Marine Engineering, pp. 157-160.

[48] "Boilers and Oscillating Paddle Wheel Engines, 300 HP Collectively, Fitted in the I.S.S. 'Abagail,'" Burgh, Modern Marine Engineering, Plate 30.

superheat the steam going to the engine from two ordinary boilers. The system was not repeated on another ship and thus may be judged unsuccessful.[49]

Runners at sea sometimes needed a full head of steam at a moment's notice. Ships' engineers had to be prepared for such eventualities and regulate their working practices accordingly. Boiler fires could not be pulled or extinguished except in dire emergencies. Fires were banked at night rather than extinguished or "pulled" so the boilers did not start cold. Banked rather than pulled fires burned more fuel, but a sufficient amount was kept ready for emergencies. Steam was built up as dawn approached to be ready to dash from blockaders revealed by the dawn. One captain instructed his engineer that ". . . it was necessary to have everything cleaned on the morning watch, so as always to have a good head of steam, and be ready for a spurt at daybreak, in case daylight might show a cruiser close by, when we would want all the speed he could put on to get beyond the reach of her guns."[50]

High-speed operations of the engines required huge quantities of steam, obtained by hotter fires in the boilers. To achieve hotter fires, rapid burning

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[49] Murray, "Recent Experiences In Marine Engineering," p. 162; Kevin J. Foster, "The Twin-Screw Blockade Runner Flora, 1862," unpublished paper presented April 22, 1985, to William N. Still, Jr., Civil War History, East Carolina University, Greenville, North Carolina.

[50] Watson, Adventures of a Blockade Runner, p. 293; Captain Roberts [Charles Augustus Hobart-Hampden], Never Caught: Personal Adventures Connected With Twelve Successful Trips In Blockade-Running During the American Civil War (Carolina Beach, North Carolina: The Blockade Runner Museum, 1967), p. 3; Wilkinson, Narrative of a Blockade-Runner, p. 151.

materials were substituted for coal during the chase. Often the material burned was taken from the cargo. The most common fuel was cotton soaked in turpentine. The material clogged the boiler tubes eventually and sometimes caused the boiler tubes to burn through, but the ship could more readily escape the immediate danger of capture.[51]

Propulsion

At the time of the Civil War, there were two principal means of propulsion: paddlewheels and screw propellers. Paddlewheels could drive a vessel faster than single screw propellers but had disadvantages.[52] Paddlewheels were heavier, more complicated, and more vulnerable to damage than screws. Paddlewheel ships were also not as maneuverable as propeller vessels.[53] To improve efficiency, paddlewheels were primarily built of several patent feathering types. Feathering paddlewheel floats pivoted parallel to the paddleshaft at each outer edge of the paddlewheel so that they entered and left the water vertically. Rigid floats, in effect, wasted energy attempting to lift the vessel on the downstroke and lift water on the

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[51] Wilkinson, Narrative of a Blockade-Runner, p. 165.

[52] Caleb Huse to Josiah Gorgas, March 15, 1862, OR, ser. 4, vol. 1, p. 1004.

[53] Letter from S. P. Lee to Gideon Welles, September 19, 1864, ORN, ser. I, vol. 10, pp. 455-456.

upstroke. Feathering paddle floats were quieter and more efficient than non-feathering floats. Passengers chose them for comfort; owners, for high speed.[54]

All other things being equal, propellers were more efficient than paddlewheels. Nonetheless, the shallow draft of runners did not allow single propellers to be built large enough to compete with sidewheelers in speed. Single screw propeller vessels were more efficient and less expensive to build, but were not as fast when built of shallow draft because they had to be deeply immersed to work efficiently. Large propellers were also needed to absorb the high horse power required for high speed. Blockade runners had to be of shallow draft to enter Southern ports. For that reason they could not use propellers large enough to drive the hull rapidly. A few extremely fine-lined single screw runners were built but it was not until the advent of twin-screws that propeller vessels approached the speed of sidewheelers.[55]

Shipbuilders as early as 1804 had tried to run two propellers from a single engine but twin-screw propulsion was not successful enough to justify the extra cost and complexity. Flora, built by J.& W. Dudgeon of London in 1862, was the first successful independently powered twin-screw ship. She was not only very fast for her

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[54] Murray, "Recent Experiences In Marine Engineering," p. 163; J.H. Ward, Steam For The Million: A Popular Treatise on Steam and ite Application to the Useful Arts, Especially to Navigation (New York: D. Van Nostrand, 1860), pp. 103-104; International Library of Technology, Marine Boilers, Marine Engines (Scranton, Pennsylvania: International Textbook Company, 1902), pp. 59-60; Spratt, Marine Engineering, pp. 100-117.

[55] John Dudgeon, "On Twin Screw Propulsion" in N. P. Burgh, Modern Screw Propulsion (London: E. & F. Spon, 1869), p. 85.

size but extremely maneuverable. The speed and handiness of the little ship led her owners to try her at blockade running. Her success led to the building of many more twin-screw steamers.[56]

Twin-screw ships were not only fast, they also were the most maneuverable type of the day. Confederate Navy purchasing agent, James Bulloch wrote Secretary of the Navy Mallory that:

> With two propellers, each should be driven by its own pair of engines so that one might go ahead and the other astern quite independent of each other. This would give great advantage in handling a vessel, enabling her to turn completely around in her length.[57]

Other Confederate officers agreed with him. Long, thin ships required more distance to turn than shorter ships. Thus, most blockade runners, with the exception of the twin-screws, were not very maneuverable. Maneuverability was sacrificed for speed.[58]

High Cargo Capacity

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[56] Captain T.E. Symonds, R.N., "On The Construction and Propulsion of Twin-Screw Vessels," in Transactions of the Institution of Naval Architects, vol. V (London: Institution of Naval Architects, 1864), pp. 185-191; John Dudgeon, "On Twin Screw Propulsion" p. 86; Foster, "The Twin-Screw Blockade Runner 'Flora, 1862'"; Smith, History of Marine Engineering, pp. 165-166.

[57] James Dunwoody Bulloch to Mallory, ORN, ser.I, vol. 2, pp. 612-613.

[58] Symonds, "Twin Screw Vessels," pp. 185-216; (Hobart-Hampden) Captain Roberts, Never Caught, pp. 6-7.

Cotton was the most valuable commodity that the South exported. American cotton was known worldwide as the finest grown anywhere. Sea Island cotton, a particularly fine variety grown on the barrier islands of the coast, brought the highest prices. (It has not been substantially improved since the 1840s.) The bulky cotton cargo was compressed before loading to allow more to be carried. Steam- and horse-driven cotton presses in Confederate ports compressed the bales. The cotton was sewn into cloth coverings and bound tightly with heavy ropes or metal bands.[59]

When the cotton bales were loaded on board ship they were carefully stowed in every bit of space below decks. Skilled stevedores used special jacks and equipment to stow the cotton bales in the runner hulls: "the cotton bales being so closely packed that a mouse could hardly find room to hide itself among them."[60] Particular care was taken to see that cotton did not get wet, as it could rot rapidly.[61]

Proper cargo loading could affect safety as well as profits. Fire in the warehouses, on wharves and on board ship was always a great danger. Smoking and naked lights were prohibited aboard when loading; ventilators were covered to prevent

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[59] Wilkinson, Narrative of a Blockade Runner, pp. 202-203; Watson, Adventures of a Blockade Runner, p. 52.

[60] (Hobart-Hampden), Never Caught, p. 13; Watson, Adventures of a Blockade Runner, pp. 64-65, 264-65.

[61] Charles H. Hillcoat, Notes On The Stowage Of Ships (New York: Colonial Publishing Company, 1919) pp. 71-73; also see cotton Jacks, timbers and description of their use in the collection of The Mariners' Museum, Newport News, Virginia.

sparks reaching the cotton below.[62] A company agent described the damage done by a fire aboard Nighthawk, one of the specially built runners:

> When she was burning, our utmost efforts were of course directed towards keeping her engine-room and boilers amidships intact, and combining the flames to both ends; in this we were successful, mainly owing to the fact of her having thwart-ship bunkers: but as regards the rest of the steamer she was a complete wreck; her sides were all corrugated with the heat, and her stern so twisted that her starboard quarter was two feet higher than her port one, and not a particle of woodwork was left unconsumed.[63]

Ships could also be damaged by improper loading. The lightly built former Clyde passenger steamer Jeanette, was very badly strained when running from pursuit. She ran full speed in a following sea with an uneven deckload of cotton; too much weight was placed amidships, too little weight was placed at the bow and stern; causing Jeanette to buckle amidships. She made port with difficulty and required strengthening to steam again.[64]

Deckloads maximized the amount of cargo blockade runners could carry. Light-weight cargo, particularly cotton, rosin, and naval stores, was stowed in every available space on deck. Two and even three tiers of cotton bales were carried. If

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[62] Wilmington Daily Journal (Friday, April 30, 1864), p. 3; Hillcoat, Notes On The Stowage Of Ships, pp. 71-73.

[63] Taylor, Running The Blockade, pp. 126-127.

[64] Watson, The Adventures of a Blockade Runner, pp. 311-312.

pursuers came too close, the cargo could be easily jettisoned to lighten the ship. One captain described the appearance of his fully loaded blockade runner as: "the great white avalanche of cotton, rushing by . . . ."[65] Naval stores such as pitch and turpentine were often carried on deck as well. Sometimes extraordinarily large items were carried in through the blockade. The blockade runner Gibraltar carried two massive 12.75-inch Blakely rifled cannon through the blockade to Charleston with the gun tubes protruding from her hatches like extra funnels.[66]

All available space was used to carry cargo, at times forcing the crew and officers make do with minimal space on board. The crew and officers often slept on deck during the run and frequently would catch up on sleep in port when the cargo was unloaded and cabins cleared. Even the officers' cabins were oftentimes used for cargo, due to the permission given the officers to carry limited amounts of cargo on their own account.[67] Cabin passengers were carried on some runners: cabins were kept available for them. Later in the war, however, the practice changed; civilian

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[65] Admiral Hobart Pasha, Sketches From My Life (New York: D. Appleton And Company, 1887), pp. 109, 112.

[66] Hobart Pasha, Sketches From My Life, p. 127; Warren Ripley, Artillery and Ammunition of the Civil War (New York: Promontory Press, 1970), pp. 157-158; Wise, Lifeline of the Confederacy, pp. 119-120.

[67] Hobart Pasha, Never Caught, pp. 103-108.

passengers were generally not permitted on board vessels in which the government had an interest, and private vessels were discouraged from carrying them.[68]

Seakeeping and Maneuverability

The hull form of blockade runners was not conducive to comfort for those on board. Because of the smooth lines designed for high speed, the ships rolled and pitched considerably in heavy seas. If they traveled too fast for the prevailing sea conditions they might dive too deeply into a wave, never to surface again. This may or may not have happened to blockade runners, but captains were aware that it was dangerous to steam too fast for the decks to shed the waves. High speed design features maximised good seakeeping qualities and allowed runners to steam faster than otherwise. Turtleback decks forward, Aberdeen stern houses, raised quarterdecks and after turtlebacks helped to shed much of the water that might have otherwise come on board, and thus allowed higher speeds. But even the most ingenious designs could not exclude all water. To deal with the remainder, many runners had open scuppers for much of their length as well as large, evenly spaced freeing ports with hinged lids.[69]

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[68] Wise, Lifeline of the Confederacy, passim.

[69] Plans of blockade runner Banshee (no. 1) reconstructed from builders model and illustrations by William Earl Geohegan, from print in collection of the Confederate Naval Museum, Columbus, Georgia.

Driving through waves at high speed, even with turtlebacks, multiple scuppers, and freeing ports, caused blockade runner decks to be very wet. Midships navigation bridges were built on most sidewheel and many screw blockade runners to give officers and the helmsman a safer and drier working position. Prior to the war these navigation bridges had been built on a few British naval vessels and passenger steamers as a connection between the tops of the sidewheel paddle boxes. Officers used it to conn the ship and as a dry vantage point to take navigational sightings. The bridge was later equipped as a place to steer the ship as well. The rudder cables were lengthened to allow the ship's wheel to be placed on the bridge. Iron or brass railings enclosed the edges of the bridge on early runners; later, canvas dodgers covered the rails for protection from spray. The wheel was ultimately placed on the bridge, enclosed in a wheel house. The final generation of blockade runners introduced raised, enclosed wheelhouses (the bridge) to general use. Some even anticipated the raised wheelhouse placement at the bow that was to become standard with later liners.[70]

Most steam blockade Runner sailing rigs were minimal, designed for emergencies, and for their steadying effect. The use of the sailing rig on one steam-powered blockade runner (Edith\ Chickamauga) was described by her captain as:

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[70] Builder's model of Banshee (I) in collection of Merseyside Maritime Museum, Liverpool, England; illustration of Stag (II), in Bradlee, Blockade Running During the Civil War, facing p. 93; model of Rosine and Ruby in collection of Dr. Charles Peery, Charleston, South Carolina.

> schooner rigged, with very short masts, and her sails were chiefly serviceable to steady her in a sea-way. Under all sail and off the wind, without steam, she could not make more than three knots in a stiff breeze; by the wind under the same circumstances, she had not even steerage way."[71]

Problems With Heavy Weather

Screw-propelled vessels were often afflicted with engine problems in bad weather. The propellers raced in heavy seas, causing terrific vibration, whenever waves were heavy enough to lift the stern clear of the water. The vibration could cause structural problems as well. Extremely long, screw-propelled wooden warships worked their sterns so heavily that severe structural deterioration required them to be rebuilt with extra fastenings and reinforcement. Runners, with their iron and steel hulls, are not reported to have suffered from vibration in the same degree, but could be strained if not handled carefully. An alert and skilled engineer was absolutely necessary to prevent racing of the screws in heavy weather. The engineer would cut off the steam as the stern lifted and turned it back on when the propellers were again immersed. Lightly built, shallow draft blockade runners were particularly susceptible to racing in high seas. One military officer passenger on a propeller blockade runner

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[71] Wilkinson, Narrative of a Blockade Runner, pp. 209-210.

proclaimed that he "would rather encounter the dangers of a 'stricken field' than voluntarily endure an hour of such torture."[72]

Lightweight hull and superstructure construction also caused problems in heavy weather. Several runner logs give accounts of losing deckhouses, bulwarks, forecastle decks, and paddleboxes in storms. The runner Beacon was so damaged in crossing the Atlantic that she returned to England, and did not try again. Several potential blockade runners were lost or disabled before reaching the island blockade running entrepots. The large steel blockade runner Lelia foundered in a gale on leaving Liverpool. The lightly built Talisman foundered in the Gulf of Mexico.[73]

The builders of blockade runners had solved the basic problems of design for their special products by early 1864. Specially-built blockade runners were very fast, of shoal draft, with moderate capacity and were reasonably seaworthy and maneuverable. But even more was required of blockade running vessels. They had

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[72] Osborne Reynolds, "The Causes of the Racing of the Engines of Screw Steamers Investigated Theoretically and by Experiment," in Transactions of the Institution of Naval Architects (London: Institution of Naval Architects, 1873), pp. 56-67; Watson, Adventures of a Blockade Runner, p. 252; Sprunt, Tales of the Cape Fear Blockade, p. 22; Lambert, Battleships In Transition, p. 54; Wilkinson, Narrative of a Blockade Runner, p. 230.

[73] F.H. Morse to W. H. Seward, January 23, 1963, no. 13, London Consular Despatches, RG 84, NA; Soley, Blockade and the Cruisers, p. 157; "The Double Disaster at the Mouth of the Mersey"; "The Steamer 'Lelia'" The Artizan (February 1, 1865), p. 44; "The Steamer Talisman Foundered." The Royal Gazette (January 3, 1865), p. 1.

to be invisible to avoid the vigilance of the United States Navy, State Department, and courts.

Chapter IV: THE BLACK ARTS: INVISIBILITY, SECURITY, RUSE, AND PROTECTION

Blockade running ships employed every form of invention, ruse, guile, and subterfuge to elude capture by the Union Navy. The vessels were designed to be hard to see, hard to recognize and hard to stop. The best ideas from several traditions of illicit maritime trade were combined with the most inventive designs to produce a very special and extraordinary group of vessels. One blockade running captain stated that: "In fact, every ruse was resorted to, to enable the vessel to evade the vigilance of the American cruisers."[1]

Invisibility

The prevention of the detection of runners or *invisibility* as one U.S. Navy Captain put it, saw considerable advancement as the war progressed. Older, more innocent color schemes were retained during the Atlantic crossing because, if ships were captured, legal condemnation was more difficult when the ships were not painted to run the blockade. Upon arrival in the island entrepots, almost all blockade runners were painted various shades of grey with tints that included red, blue, and

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[1] Hobart, Sketches From My Life, p. 90.

green.[2] When invisibility was needed the ships were repainted, modified to the blockade running rig, and often changed in name and ownership of record.[3] The color was known as blockade grey, and was the first widespread use of camouflage paint for ships.[4] One blockader reported following a runner visible only by the spray produced by her paddles.[5]

Blockade grey became a requirement for successful runners by late 1863. Not only was the color hard to see at night, it blended well with the light colored beaches of the southern coastline in the daytime.[6] One frustrated Union officer reported that "the blockade runners are now all painted white, and run so close to the beach that it

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[2] Logbook of Coquette, November 21-December 9, 1863; Dundas, "Confederate Veteran Recalls Blockade Running," United Daughters of the Confederacy Magazine (November 1952), pp. 5-12.

[3] Logbook of Coquette, November 21-December 9, 1863.

[4] For examples of the various colors in which blockade runners were painted see accounts of an unknown sidewheel steamer "painted greenish white," Acting Volunteer Lieutenant J. B. Breck to Commander W. A. Parker, ORN, I, vol. 10, p. 44; the single-screw steamer Phantom was painted grayish-green, Sprunt, Derelicts, p. 103; Falcon was painted white, Gideon Welles to S. P. Lee, September 7, 1864, ORN, I, vol. 10, p. 438; Owl was painted light red, telegram from U.S. consul M.M. Jackson at Halifax to W.H. Seward, August 31, 1864, ORN, I, vol. 10, p. 410; Don was painted a "dull grey color", Hobart, Sketches From My Life, p. 89; Kate was painted "a faintly bluish-white," S.H. Brown, "Running The Blockade" in The Blue Peter (n.p.: n.d.), p. 562; Robert E. Lee was painted "lead color," Wilkinson, Narrative of a Blockade-Runner, p. 171; Colonel Lamb's hull, masts, and companions were painted "slate color," her funnels and the insides of the paddleboxes were black, letter from U.S. consul at Liverpool to the Secretary of State, September 7, 1864, ORN, I, vol. 10, p. 439.

[5] Report of Cmdr. Patterson to Capt. J. F. Green, ORN, I, vol. 16, pp. 31-32.

[6] Hobart, Never Caught, pp. 120-121.

is impossible to see them 100 yards off at night. . . ."[7] Another Union officer reported that "the hull rose only a few feet out of the water, and was painted a dull gray or lead color, so that it could hardly be seen by daylight at two hundred yards."[8] The Union Vice Consul General in Havana reported of a group of runners "all these boats are of course painted lead color."[9]

Blockade grey varied from white and very light grey to a darker shade called "lead color" by mariners. Trial and error taught the best shade for a particular area. Ships at sea are visible because they contrast with the background, lighter ships generally being harder to discern than darker ships.[10] The vessels operating from Bermuda used the lightest colors and those from Nassau a slightly darker color. A dark lead color seems to have been favored in the Gulf of Mexico by the steam

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[7] Report of Captain Ridgely to Acting Rear-Admiral S.P. Lee, November 10, 1863, ORN, I, vol. 9, p. 295; for illustrations of blockade grey see painting of Denbigh in "lead color", Time-Life Books. gen. eds., The Blockade: Runners and Raiders, pp. 92-93 and photo of painting in collection of Dr. Charles Peery, Charleston, South Carolina; see painting of St. Georges harbor full of white and light grey colored steamers, Time-Life Books, The Blockade: Runners and Raiders, p. 89.

[8] Soley, Blockade and the Cruisers, p. 157.

[9] Thomas Savage to W. H. Seward, Despatch No. 205, September 17, 1864, Havana Consular Despatches, RG 84, NA.

[10] Groups such as the Camouflage Board of the First World War and the United States Navy Bureau of Ships and the British Admiralty in the Second World War advised painting ships to make them harder to spot and track. U.S. Navy, Bureau of Ships, "Discussion of Visibility of a Surface Ship At Sea," in Ship Camouflage Instructions, United States Navy, Ships-2, first rev., September 1941, Operational Archives, U.S. Naval Historical Center, Washington, D.C., p. 26.

runners and a lighter shade for sailing runners. The use of lighter colors in more northerly areas during the War presaged the same preference arrived at by later groups responsible for camouflage.[11]

A few blockade runners were given deceptive paint schemes to make them harder to recognize once sighted. Methods were fairly unsophisticated, compared to those of the First World War. The runners were painted a very light grey color overall, with darker shadow outlines painted on their sides. One example was the twin-screw runner Vesta, which was painted white from the smoke pipe forward and dark lead color aft of the pipe. This was designed to confuse Union blockaders as to the identification of the ship, and to throw off gunners' range estimates and thus their aim.[12]

Camouflage paint was effective; by the end of the war, not only blockade runners but the Union Navy had also adopted camouflage on many blockading vessels.[13]

Blockade runner builders emphasized designs that would make their constructions hard to locate by day or night. The silhouettes of runners built for the

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[11] Thomas Savage to W. H. Seward, despatch no. 205, September 17, 1864, Havana Consular Despatches, RG 84, NA.

[12] Report of Commander Donaldson to RAdm. S.P. Lee, January 11, 1864, ORN, I, vol. 9, pp. 402-405; Alon Bement, "Principles Underlying Ship Camouflage" in International Marine Engineering (February 1919), pp. 90-93.

[13] Instructions from Acting Rear-Admiral S. P. Lee to Captain Sands, September 1, 1864, ORN, I, vol. 10, pp. 414-415.

trade were minimal to make them harder to detect. Ships with low hulls and little rigging are not visible from as far away as larger, full-rigged ships. Because of the reduced silhouette, blockaders had to be nearer to runners before they could discern them; the apparent horizon was lowered, forcing blockaders to be closer together to be sure to spot a runner.[14] Blockade runners usually spotted Union vessels, with their large silhouettes, long before they were seen themselves, allowing then to avoid passing nearby. One runner captain said, "Our policy is to see, and not to be seen, to keep a good lookout from the forecastle-head at night, and from the mast-head by day."[15]

Hulls had a low freeboard, and low gunwales and rails to keep their visual mass as low to the water as possible. Smooth, minimal superstructures were the norm on most blockade runners. This trend was exemplified by the runners built by Jones & Quiggin of Liverpool. Their first blockade runner superstructures were angular but later runners exhibited superstructures composed of a symphony of subtle, swelling curves.[16]

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[14] The Union Navy was aware of the problem and sought to station vessels with low profiles and without spars near blockaded ports. Captain Chas. S. Boggs to Acting Rear-Admiral S. P. Lee, March 29, 1863, ORN, I, vol. 8, p. 635. A more modern example of the same phenomenon was the surface attack method used by Second World War submarines. See Norman Friedman, Submarine Design and Development (Annapolis, Maryland: Naval Institute Press, 1984), pp. 9-11.

[15] Watson, Adventures of a Blockade Runner, p. 293.

[16] Analysis of Banshee, Colonel Lamb models at Merseyside Maritime Museum, Liverpool.

Sailing rigs were minimal on most steam blockade runners. Sails served only to steady the ships when under steam power and added little to their speed, but greatly increased the risk of detection.[17] Many steam runners were built with polacca schooner rigs with the topmasts integral to the masts. Some captains reduced the rig still farther on arrival at the islands. Topmasts were cut from the pole masts, reduced in length, and fidded to the lower masts, allowing the topmasts to be struck when desired.

Schooners and brigs, forced to rely on sail power, set their sails only at night or away from blockade patrol areas. One schooner captain explained how he made the voyage between Galveston and Havana. "Laying becalmed, with our sails down about half the time, keeping a lookout from the masthead, and when we saw anything on the horizon, pulling out of sight with the sweeps."[18] In general, sailing rigs and spars were kept simple and were made just large enough to serve their purpose. Large expanses of sail did not materially add to speed and increased the visibility, and thus the risk to the ship. Steamers could be made less visible than sailers.[19]

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[17] Wilkinson, Narrative of a Blockade Runner, pp. 209-210.

[18] Watson, Adventures of a Blockade Runner, p. 303.

[19] "Cut the topmasts off 18 inches above the scarph," logbook of Coquette, November 25, 1863; the large silhouette of the gaff sails was reduced by replacing them with leg-of-mutton sails, logbook of Coquette, entry for April 20, 1863. See also Watson, Adventures of a Blockade Runner, pp. 308-310.

When the runners were breaking through the inshore line of blockaders even masts and smokestacks could give them away. To avoid being sighted, the silhouettes of many runners often were further reduced during the most hazardous portions of the run through the blockade. Many runners eliminated all but one mast or laid the masts down on deck for the critical run through the inshore blockading line. Lower masts were laid down on deck through a type of hinge arrangement called a mast tabernacle. Tabernacles allowed masts to pivot at the deck and lie down as flat as other deck structures allowed. A few runners removed their masts altogether.[20]

A masthead lookout was the principal reason for retaining a mast in spite of the increased risk of detection. Most runners maintained one or more lookouts at the masthead to give warning so that the course could be directed away from any vessel sighted.[21] Steadying sails could also be set to prevent the ship from losing speed through excessive rolling.[22]

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[20] Masts and booms were also used in port for cargo handling. For instances of mast removal or lowering see T. H. Chase to F. H. Morse, March 2, and March 27, 1863, London Consular Despatches, RG 84, NA; Brown, "Running the Blockade." p. 562; and Aries painting, The American Neptune Pictorial Supplement No. III: Blockade Runners (Salem, Massachusetts: *The American Neptune, 1961), Fig. 13*; Hobart, Sketches From My Life, p. 96; Watson, Adventures of a Blockade Runner, p. 293; Soley, Blockade and the Cruisers, p. 157; for removable masts and funnel see description of Princess Royal in telegram from M. M. Jackson to Gideon Welles, January 9, 1863, Halifax (N.S.) Consular Despatches, RG 84, NA.

[21] Wilkinson, Narrative of a Blockade-Runner, p. 85.

[22] Wilkinson, Narrative of a Blockade-Runner, p. 151.

In addition to masts, the smokestacks of most runners could be made less visible. They were made to be partially removable, fold over on hinges, or telescope on themselves. Telescoping funnels were devised for passing under low bridges in Great Britain but found a new use on the southern coastline. Smokestacks were raised and lowered through the use of cables or worm gears.[23] Reducing the silhouette allowed a ship to blend in with the shore or "lie in under the land, almost invisible," as one reporter put it.[24] Blockade runners re-erected their masts and smokestacks once seen and chased. Some captains chose to keep the funnels up to allow maximum speed; the boilers received more air when the smokestack was raised and thus burned hotter.[25]

The captain of Don described how he avoided detection by a blockader:

> By lying as close as we dare to the beach, we must have had the appearance of forming part of the low sand-hills, which were about the height and color of the vessel; the wood on their tops forming a background which hid the small amount of funnel and mast that showed above the decks. We must have been nearly invisible, for we had scarcely been an hour at anchor when a gunboat came steaming along the shore very near to the beach; and while we were breathlessly watching her, hoping that she would go past, she dropped anchor alongside of us, a

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[23] Burgh, Modern Marine Engineering, pp. 338-340.

[24] "Trial Trip of the Double Screw Steamship Kate," The London Times (March 2, 1863); Hobart, Sketches From My Life, p. 90; Wilkinson, Narrative of a Blockade-Runner, pp. 141-142.

[25] Acting Volunteer Lt. Garfield to S. P. Lee, August 15, 1864. ORN, I, vol. 10, p. 364; Soley, Blockade and the Cruisers, p. 157.

> little outside where we were lying -- so close that we not only heard every order that was given on board, but could almost make out the purport of the people on her decks.[26]

An unwitting display of lights at night sometimes betrayed unwary runners. Blockaders sometimes detected runners from tiny glimmers revealed on dark nights. Considerable pain was taken to cover the stokehold hatches, portholes, and decklights to prevent detection. Even the binnacle light was hooded. Smoking on deck was forbidden for the same reason.[27] On board at least one runner anyone showing a light when near the blockade fleet was liable to "death on the spot."[28]

Blockade runners sometimes gave their position away by clouds or even traces of exhaust smoke in the sky. Smoke could betray runners to Union warships far over the horizon. The propeller steamer Emma was captured after a Union transport noticed her "very black smoke."[29] The sidewheeler Robert E. Lee was spotted by a nearby blockader because of a "slight puff of smoke" when she fired up her boiler.[30]

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[26] Hobart, Sketches From My Life, pp. 120-121.

[27] "Crew employed painting and making skylight covers," logbook of Coquette, entry for December 4, 1863; Sprunt, Derelicts, p. 268; Morgan, Recollections of a Rebel Reefer, p. 96; Francis W. Dawson, Reminiscences of Confederate Service, 1861-1865 (Baton Rouge: Louisiana State University Press, 1980), p. 27.

[28] Wilkinson, Narrative of a Blockade-Runner, pp. 127.

[29] Henry A. Gadsden to Gideon Welles, July 26, 1863, ORN, I, vol. 14, p. 399.

[30] Wilkinson, Narrative of a Blockade-Runner, pp. 171-172.

Some types of coal were preferred over others as different types of coal produced various amounts of smoke. When available, runners burned anthracite coal as it was clean burning and produced very little smoke. Anthracite coal came primarily from mines in Pennsylvania, and its export was forbidden midway in the war. Afterwards, runners obtained the northern "hard" coal by subterfuge or used the next best thing, high quality Welsh or Canadian semi-bituminous coal.[31] The engineer on board Lillian kept "the finest Welsh coal . . . picked and piled upon the boiler-room plates, for use in an emergency."[32]

As late as January 1865, a Union sympathizer in Havana reported that "it is well known that the blockade runners have each a small quantity of hard coal each trip." He reported that the captured steamer Kate, a former runner, carried hard Northern coal to Havana on her first trip under her new owners. Kate carried "200 or 300 tons" from New York and unloaded it late at night into lighters sent to fuel different blockade runners.[33]

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[31] Wilkinson, Narrative of a Blockade-Runner, p. 159; Hobart, Sketches From My Life, p. 90; Watson, Adventures of a Blockade Runner, pp. 293-94; Soley, The Blockade And The Cruisers, p. 157. For the coal used by Union blockaders see Alfred Thayer Mahan, From Sail To Steam: Recollections of Naval Life (New York: Harper & Brothers Publishers, 1907), pp. 162-163.

[32] Sprunt, Derelicts, pp. 267-268.

[33] Letter from Theodore E. Allen, to H. A. Gilbert, Washington, D.C., January 13, 1865, Havana Consular Despatches, RG 84, NA.

The ship's engineer was frequently a key factor in regard to smoke; good engineers maintained the most efficient fires, produced smoke only on request, and always had steam ready when it was required. The skill and care of engineers was crucial at night when the runner could be given away by sparks from the funnel or by "flaring," the ignition of soot in the funnel. Sparks and flaring were prevented by careful watch over the fires and dampers, periodic cleaning, and screens in the funnel to catch cinders.[34] Secretary Mallory requested that Captain Bulloch

> call the attention of steamship builders to the importance of preventing the escape of sparks and luminary smoke from the stack, a subject which has been considered to some extent in connection with the perils of fire. Approaches to the blockading fleet are betrayed at night by this means, and I am persuaded that the ingenuity of builders can devise a damper or other means to prevent it for a short time at least.[35]

Occasionally engineers were asked to produce, rather than eliminate smoke, to create a smoke screen to aid escape from pursuers. The dampers were opened wide causing a dense cloud of black smoke to be thrown out by the funnel. The runner could then escape by turning at a right angle to the previous course while hidden from

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[34] Sprunt, Derelicts, pp. 267-268; Taylor, Running the Blockade, p. 95.

[35] Usina, Blockade Running In Confederate Times, p. 26; Letter from Mallory to Bulloch, March 21, 1864, ORN, II, vol. 2, p. 615.

view. The smoke could be stopped by closing the dampers again and adjusting the draught.[36]

Noise from runners also sometimes betrayed them to blockaders. The early morning hours as sunrise approached were particularly dangerous. Several blockade runner officers mention in their memoirs the hurried strangulation of roosters as morning approached. One also records blindfolding a stallion to prevent noise.[37] Other than the living creatures on board ship only the rigging and machinery produced detectable amounts of noise. Boiler steam pressure was kept low enough to prevent the safety valve from opening; if opened, it could give off a noise audible for miles. Early in the war, many ships' engineers took the additional precaution of redirecting the overflow steam from the safety valve to an underwater steam blow-off. By mid-1864 underwater blowoffs were standard equipment as blockade runners left the shipyard.[38] Even the sound of the paddlewheel was dangerous; at least one

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[36] Watson, The Adventures Of A Blockade Runner, pp. 296-298; Wilkinson, Narrative of a Blockade-Runner, pp. 167-168; Taylor, Running The Blockade, pp. 40-41; Scarf, Confederate States Navy, p. 490.

[37] Taylor, Running the Blockade, p. 40-41; Hobart, Sketches From My Life, p. 90; Anderson, Confederate Foreign Agent, pp. 96-97.

[38] Logbook of Coquette, entry for May 21, 1864; "Specification of 2 Iron Twin Screw Tug Steamers For Messrs. Patrick Henderson of Glasgow" in Denny Collection, University of Glasgow Archives, Glasgow, Scotland, p. 10; extract from consular despatch of the U.S. Consul at Glasgow dated June 18th, 1864, and distributed by Rear-Admiral S.P. Lee in a circular dated July 18th, 1864, Teneriffe Consular Dispatches, RG 84, NA; unsigned letter to M. Dudgeon, captured aboard Kate, June 30, 1863, ORN, I, vol. 9, pp. 122-123.

paddlewheel runner had canvas screens fitted below the paddleguard to hide the noise of the wheels.[39]

Security

Blockade runners and those associated with them learned to keep their activities secret. They also misled potential adversaries through ruse. Secrecy and guile were necessary to prevent positive identification of individual vessels as potential blockade runners; several known blockade runners were captured far from Confederate shores and condemned by U.S. prize courts. Prize courts considered blockade runners susceptible to capture on the initial run from British ports if they could be identified as potential runners. Consuls and spies in European ports and island entrepots produced descriptions of suspicious vessels bound through their areas and circulated them to the blockading fleets.[40]

Blockade runners had to beware of saboteurs as well. Confederates guarded carefully against: "a few fanatics, who, contrary to the usages of war, and upon their own initiative and responsibility, attempted the destruction of Confederate steamers at sea by secretly hiding in their bunkers imitation lumps of coal, containing explosives

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[39] Usina, "Blockade Running In Confederate Times," p. 26.

[40] Merli, Great Britain and the Confederate Navy, pp. 241-242; Bernath, Squall Across the Atlantic, pp. 63-98; As examples see Thomas Savage to William Seward, May 3, 1864, No. 134, Havana Consular Despatches, RG 84, NA; F. H. Morse to W. H. Seward, January 29, 1863, No. 19, London Consular Despatches, RG 84, NA.

of sufficient power to sink a vessel when this object was shoveled into the furnaces under the boilers." Several attempts were frustrated by detection of the explosives by the boiler stokers.[41]

Union Consul M. M. Jackson in Halifax, Nova Scotia, reported that:

> I have found it necessary to employ persons at different times to procure information in relation to vessels engaged in running the blockade of the southern ports. The information thus offered has materially added to my own efforts and investigations and enabled me to communicate to the Department of State facts which have led to several important captures."[42]

Most vessels identified as runners in consular reports and subsequently captured by U.S. vessels were condemned by the prize courts. The former Clyde River steamer Thistle was captured in November 1862, off Madeira in the Azores; Peterhoff and Dolphin were captured off St. Thomas in the Danish West Indies in February 1863. All three ships were condemned as blockade runners in Union prize courts on the basis of information gathered by American consuls in Britain. Secrecy, guile, and trickery were the only ways for runners to prevent identification.[43]

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[41] Sprunt, Derelicts, p. 277.

[42] *M.M. Jackson to William H. Seward, December 9, 1863*, Halifax Consular Despatches, RG 86, NA.

[43] Usina, "Blockade Running in Confederate Times," pp. 22-23; Bernath, Squall Across The Atlantic, pp. 64, 110-112.

The process of misdirection and secrecy surrounding blockade runners began from the moment that they were ordered from the builders. Information on the owners, destination, potential trade, and design parameters of the ships was seldom released, but often speculated upon in the press. A number of shipowners and builders employed agents who were the initial owners of record of vessels bound for the South; names of the actual owners never appeared on public documents. Many shipbuilders restricted exact performance data of their potential blockade runners in order to hamper Union as well as their competitors' efforts to gain such information. They were proud of the progress made in design but reluctant to divulge information concerning it. Some went so far as to launch vessels bound for the Confederacy at night.[44]

Freeman H. Morse, the Union consul in London reported his problems in obtaining information about Confederate vessels building in Great Britain:

> Shipbuilders here know the dangers of openly building war vessels and having them fitted here for the rebels and therefore use the utmost precaution to conceal their designs. The yards are generally surrounded by high walls or fences and guards constantly stand at the gate and no one can enter without a pass. So secretly is every thing connected with the destination and employment of the ship kept that the workmen and employees hear nothing and know nothing of it. It is therefore very difficult to get such information and

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[44] For a further explanation of the extent of secrecy see Foster, "The Twin-Screw Blockade Runner Flora."

> testimony as will secure the seizure of a vessel by the government here.[45]

Information about the ownership of blockade runners was particularly protected.[46] Both privately-owned and Confederate government runners kept ownership information secret, but government vessels had more pressing reasons to do so. Under accepted international law, naval transports owned by a belligerent government were treated differently from vessels carrying supplies for hire. National transport vessels would be subject to the same restrictions as warships. They would have been forbidden to load or discharge cargoes, take on coal or call at a particular port more than once every three months. Cargoes were consigned and shipped only by individuals or commercial houses rather than the Confederate government.[47]

To avoid restrictions, officers of blockade runners owned by the Confederate government were instructed not to give out any information as to their ownership. Naval pennants and warship insignia were specifically forbidden. Cover information

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[45] F. H. Morse to W. H. Seward, January 29, 1863, no. 19, London Consular Despatches, RG 84, NA.

[46] James D. Bulloch to S.R. Mallory, June 3, 1864, ORN, II, vol. 2, p. 659.

[47] James D. Bulloch to S.R. Mallory, September 15, 1864, ORN, II, vol. 2, pp. 721-722; Wilkinson, Narrative of a Blockade-Runner, p.174; Courtemanche, No Need of Glory, pp. 85-87, 92-101. An example of the problems refueling a government vessel is Don Higginbotham, "A Raider Refuels: Diplomatic Repercussions," Civil War History, IV (June 1958), pp. 129-142.

and whitewashed papers were provided to customhouse officials, although they must often have known or suspected the true nature of the vessels they cleared.[48]

Blockade running vessels' names were changed to make them more difficult for Union agents to identify and to confuse neutral governments. Several vessels owned by the Confederate government changed names and owner of registry when their ownership became known. The Union consul in London noted the statement of a pilot in Falmouth that "it is not an uncommon thing for one name to be erased and another substituted . . . ." The blockade runner Atalanta became CSS Tallahassee, and then CSS Olustee when she was used in naval service. When she returned to blockade running her name was appropriately changed to Chameleon. The names of privately owned vessels in the trade were also changed.[49]

Blockade runner names were also sometimes used to mislead potential captors or spies. Many blockade running ships, lost in action, were replaced by ships of the same name as the casualties, confusing Union records and spies. Thus the steam blockade runners Banshee and Flora, took the names of captured blockade running schooners. Both were ultimately replaced by other steamers with the same names.

Blockade runners under construction were sometimes given false, foreign sounding names to mislead spies as to the vessels' ultimate destination. A popular

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[48] Letter from Josiah Gorgas to Captain Commanding Cornubia, September 25, 1863, ORN, I, vol. 9, p. 284.

[49] Freeman H. Morse to William H. Seward, June 24, 1864, London Consular Despatches, RG 84, NA; Watson, The Adventures Of A Blockade Runner, p. 287.

misdirection was to attempt to link potential blockade runners with other secret shipbuilding efforts with fewer legal problems. British yards at this time were building ships for service all over the world. During the early 1860s, there were conflicts in China, New Guinea, Denmark, Mexico, Peru, Santo Domingo, and in other areas of South and Central America.

One large group of blockade runners used a British-government approved fleet sale to China as a cover. A fleet of warships was being built for China in Great Britain under the supervision of Captain Sherard Osborne, R.N. Great Britain assisted China to suppress the revolution using the fleet as a semi-official means of supporting the Emperor. Confederate agents and British shipbuilders sowed confusion and used official acceptance of the China-bound fleet to obscure the destinations of their vessels. Several ships bound for Confederate service were given names such as Tientsin and Yangtze and many ships were said to be bound for the Orient. In the confusion caused by this misdirection, numbers of legitimate British vessels were also suspected by U.S. Consuls of Confederate connections. The "real" Anglo-Chinese war steamer Keang-Soo, was suspected and thoroughly inspected by the U.S. Consul at Teneriffe, when she called there in June, 1863. He described her as "a very suspicious vessel" and reported that "it is the general opinion here that she is a

Confederate vessel in disguise, although she is apparently not calculated for a cruiser, being exceedingly sharp and narrow, side-wheel, wooden ship."[50]

The practice of using China as a cover for Confederate ships became so well known that it became a popular joke in Great Britain to refer to Jefferson Davis as the Emperor of China. The Engineer reported the subterfuge in 1863:

> The term "Chinese" is in general use in the building-yards of the Clyde and the Mersey to designate the Confederates, and the "Emperor of China" has no other significance in this connection than to personify Jefferson Davis.[51]

Vessel documentation was often deliberately misleading and was changed when needed. The process of changing national registry was fairly simple and it was used to protect ships from capture. Blockade runners owned by the Confederate government usually were registered in Great Britain and flew the British flag because open knowledge of their ownership would brand them as naval transports and close foreign ports to them under the rules of neutrality.

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[50] William H. Dabney to William H. Seward, June 14, 1863, Teneriffe Consular Despatches, RG 84, NA; Frank J. Merli, "A Missing Chapter in American Civil War Diplomacy: The Confederacy's Chinese Fleet, 1861-1867," in Clark G. Reynolds, ed., Global Crossroads and the American Seas (Missoula, Montana: Pictorial Histories Publishing Company, 1988), pp. 181-196.

[51] "The Emperor of China and the Shipbuilders," in The Engineer, 15 (1863), p. 14; David John Lyon, The Denny List (London: National Maritime Museum, 1975), pp. 96-97.

Private citizens of many nations preferred to operate their ships under the British flag when facing the Yankee blockade. To avoid problems for the owners of British ships violating the Queen's Neutrality Proclamation, many vessels were "outlawed." This involved officially ending the voyage of the ship in the Bahamas or at Bermuda and paying off the crew as they signed off the ship's articles. The crew were given a bonus of two months' wages and attached to the vessel unofficially, receiving pay for each voyage through the blockade.[52]

Social customs were modified for security as well. An elaborate social custom of exchanging greeting cards had grown up during the opening days of the Victorian era. An interesting variation on the custom was the exchange of small photographs called *Cartes De Visite* (CDVs). In the early part of the war these included photographs of ships and officers in Confederate service or engaged in running the blockade. Several CDVs were captured on board blockade runner prizes and more were obtained by Union spies. The photographs gave the Union valuable information about the appearance of vessels and crews engaged in blockade running. The exchange practice was curtailed after several ships and officers were captured and identified by the CDVs.[53]

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[52] S.H. Brown, "Running the Blockade," p. 562-564: Wilkinson, Narrative of a Blockade- Runner, p. 227.

[53] Usina, Blockade Running In Confederate Times, pp. 23-24.

Ruse

Blockade runners and those associated with them also misled potential adversaries with various ruses. If, despite all of precautions, a runner were discovered by blockaders, the ship often resorted to ruses. One took advantage of the U.S. Navy practice of using pyrotechnic rockets to inform other blockaders of the track taken by runners at night. Once the practice was known, several runners responded by firing similar rockets at right angles to those fired by the blockader, throwing off the chase. Another runner captain caught close to a blockader surrendered, only to speed off into the night leaving the blockader to pick up her boarding party in their small boat. Atalanta's captain used a ruse when she was being chased away from her destination by a single blockader. He turned around and steamed towards his pursuer as if he were armed, the blockader fled. Wily blockade runner captains became skilled at hiding within squalls and using the Gulf Stream to give additional speed when being chased.[54]

Protection

Blockade runners were not permitted to defend themselves from blockaders if fired upon, and had to withstand hostile shellfire or capitulate. Because of the potential danger, builders of runners worked to make their products as safe from

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[54] Letter from Captain Sands to S.P. Lee, September 7, 1864, ORN, I, vol. 10, p. 435; Usina, Blockade Running In Confederate Times, p. 24; Wilkinson, The Narrative of a Blockade- Runner, pp. 155-156; Hobart, Sketches From My Life, pp. 114-115.

hostile gunfire as possible. Hulls and machinery were protected in several ingenious ways.

Propulsion machinery was placed as low in hull as possible for protection from shellfire. The vulnerability of paddlewheels, machinery, and boilers to hostile gunfire had long been a bone of contention in naval circles. The consensus reached by observers was that warship machinery should be placed as far as possible beneath the water surface. Screw propeller engines could be placed deeper in the hull than paddle engines and thus were much safer than paddlewheels, but other problems kept them from wider adoption in runners.

The largest part of the space required for propulsion was taken up by the boilers. Boilers had to be built low in the hull for protection from shot but inconveniently occupied space that might be used for cargo. Blockade runner owners had to balance the need for huge quantities of steam, requiring large boilers to maintain high speed, with the loss of revenue resulting from less available cargo space.[55]

Low-pressure boilers were thought safest and were the norm in blockade runners. Many ships' officers preferred them due to the fear of injury from high pressure steam if the boilers exploded or were hit by shells. Time proved this fear to

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[55] Captain S. Eardley-Wilmot, R.N., The Development of Navies During the Last Half-Century (London: Seeley And Co., 1892), pp. 216-217; Charles Atherton, On Marine Engine Construction and Classification (London: John Weale, Architectural [illegible] pp. 62-63.

be mostly unfounded. Low-pressure steamers suffered far more fatal accidents than did high-pressure steamers.[56]

The propulsion machinery on many runners was protected by surrounding the engineering spaces with coal bunkers or cargo spaces. The thin hull plates of runners presented little impediment to shellfire. Coal presented some protection from penetration and was kept in the confined bunker spaces to prevent shells from setting it afire. Coal had to be accessible to the stokers and trimmers who fed the boiler fires. It also had to be taken in equal amounts from the bunkers on each side and fore and aft to keep the ship in trim as the coal was used up. The spaces on each side of the engine room met those requirements and were built to surround and protect the engine room. The protection was described in a Liverpool newspaper column.

> . . . the engines are amply protected by the arrangements of the coal bunkers from shot if the ship in her future career should ever come within range of hostile guns. The Louisa Ann Fanny has been built for purely commercial purposes, but as she may not improbably some day cross Wilmington bar, this protection afforded to her machinery by the arrangement of her coal bunkers is a very necessary precaution.[57]

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[56] Smith, Short History of Marine Engineering, pp. 125, 135-137.

[57] Plans of Ella, Caroline, Emily, and Imogene all show coal bunkers placed alongside the length of the engine and boiler rooms, Denny Collection, National Maritime Museum, Greenwich, London, England; "Trial Trip of the Twin-Screw Steamer Mary Augusta," The Artizan (January 1, 1865), p. 5; "Double Screws" Liverpool Telegraph, Jan. 27, 1865.

Another reason for the bunker placement was that runners needed the spaces fore and aft of the engine room for cargo. Coal protection for engineering spaces was adopted in many naval vessels several years after the war. Coal *armor* was so important that it gave name to a type of warships, protected cruisers.[58]

Cargo holds were also used for protection of the engineroom. Cotton afforded more protection than coal and several runners were built with cotton holds around the engineroom. It was stowed in special narrow holds outside of the stokeholds.[59] Many other Confederate ships stowed extra bales of cotton around the deckhouses and around the helm. Captain Watson described the cotton "armor" on board Jeanette:

> . . . a shot struck our funnel, passing through it about three feet above the crown of the boiler. This was rather dangerous, as had that shot been a little lower it would have perforated the boiler . . . observing that the deck-load of cotton protected the boiler a good way up; I told them to bring a few bales from the forward and after parts of the deck-load and pack over the exposed part of the boiler.[60]

Redundant steering arrangements were built into many blockade runners. An emergency steering apparatus allowed control to be maintained if the main steering

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[58] Eardley-Wilmot, The Development of Navies During the Last Half-Century, pp. 140-141.

[59] Lark and Wren had holds "alongside the engines & boilers" which held 40 or 80 bales of cotton. Albatros and Penguin had room for 100 bales in the corresponding space, "Vessels No. 217 & 218," Contract Book No. 2, p. 276; "Vessels No. 319 & 320," Contract Book No. 2, p. 280.

[60] Watson, The Adventures Of A Blockade Runner, pp. 311-312.

chains were severed or the wheel on the bridge damaged. The secondary steering was usually at the stern, where it could be put into operation quickly if needed.[61]

Some runners also fitted redundant capstans. A capstan at the stern could be valuable if the ship went aground. With the ordinary capstan or windlass working forward and the small after capstan working aft, ships sometimes pulled themselves free of shoals.[62]

Most blockade runners were built with excellent water-tight compartmentation. The loss of the passenger steamship Arctic in 1854 because of the lack of water-tight bulkheads had been well publicized. The small iron steamer Vesta, which struck the huge Arctic, had a collision bulkhead and survived. The Arctic disaster led to an awareness of the value of water-tight bulkheads.[63] All ships thereafter were required to have at least collision bulkheads forward. Blockade runners exceeded the requirements. The typical paddle runner was built with five bulkheads, creating six

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[61] See plans of Hope, Colonel Lamb, Fergus/The Dare, and Mary Bowers/Stormy Petrel, National Maritime Museum, Greenwich.

[62] Such a capstan is visible atop the stern deckhouse of the runner Dee. Photograph held by the United States Army Military History Institute at Carlisle Barracks, Pennsylvania.

[63] Alexander Crosby Brown, Women and Children Last: The Loss of the Steamship "Arctic" (New York: G.P. Putnam's Sons, 1961), pp. 183-184.

compartments. The typical screw-propelled runner had four bulkheads, although some had as many as six.[64]

At least one mast on most runners mounted a crow's nest or lookout perch. The use of a lookout at the mast head gave a wider apparent horizon to the runner, and because of the small area of the mast top usually allowed the runner to see and avoid a blockader before she herself was seen.[65] Sailing blockade runners also used reduced their top hamper to avoid detection by dropping their sails and sometimes even their masts during daylight hours, sailing only at night.[66] This same advantage in relative visibility was used by submarines during the Second World War to stalk their prey on the surface without being seen.[67]

Another type of protection for blockade runners was strategic in nature and involved the destruction of individual ships. A runner was considered expendable if, by its destruction, other runners could be protected from capture. Secretary of the Navy Mallory instructed the commanders of government runners to destroy their ships rather than surrender to the Federals.

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[64] See blockade running vessel entries in Lloyd's Register; Lloyd's Vessel Surveys of blockade runners; Brown, Women and Children Last, passim, pp. 217-219.

[65] See foremast top in painting of Denbigh, private collection, Charleston, South Carolina, reproduced in Time-Life Books, Blockade: Runners and Raiders, pp. 92-93.

[66] Watson, Adventures of a Blockade Runner, pp. 112, 113.

[67] Richard H. O'Kane, Clear The Bridge: The War Patrols of the U.S.S. Tang (Chicago: Rand McNally & Company, 1977), passim.

> It is of the first importance that our steamers should not fall into the enemy's hands. Apart from the specific loss sustained by the country in the capture of blockade runners, these vessels, lightly armed, now constitute the fleetest and most efficient part of his blockading force off Wilmington.

He ordered plans to be made for saving all hands and destroying the vessel and cargo when necessary to prevent capture. Accordingly many runners were destroyed or run aground when capture was eminent. Among other preparations, turpentine was kept in barrels on deck, ready to be breached to set the ship afire.[68]

Blockade runners were the first large group of vessels to employ many physical characteristics common to all warships today. Shapes and silhouettes difficult to see, painted in camouflage colors with lightweight armor protection for the machinery are reminiscent of modern stealth aircraft. The careful security measures undertaken also suggest the protections surrounding modern high technology. Blockade runners were at the leading edge of nineteenth-century technology.

While the blockade lasted, the shipbuilders of Great Britain built ships that embodied all of the advantages that technology could offer for success in a risky trade. Much of the hard-won success enjoyed by the blockade runners was due to the technologies of stealth and protection developed by British shipbuilders and the techniques of secrecy and guile employed by all connected with the business.

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[68] S.R. Mallory to R. H. Gayle, December 6, 1864, in ORN, I, vol. 11, pp. 623-624; Sprunt, Derelicts, pp. 110-11; Royce Gorgon Shingleton, John Taylor Wood: Sea Ghost of the Confederacy (Athens: University of Georgia Press, 1979), p. 106.

Chapter V: BLOCKADE RUNNER TYPES: EARLY EXAMPLES AND SIDEWHEELERS

Early Vessels Built for Blockade Running

The huge fleet of blockade runners bought and hired from the coasts of Great Britain soon proved insufficient in numbers. Ship-building was begun for Confederate service soon after the beginning of the war. Prior to the end of 1862, there were two widely divergent schools of thought on blockade runner design. The blockade running entrepot system had not yet been organized and shipowners had to build ships adapted to the trade they visualized. A few forward-thinking shipowners built light-draft, short-voyage runners, anticipating an entrepot system; others built large steam-auxiliary steamships capable of making the entire voyage from Great Britain to the Confederate States. The designs of these ships varied depending on the shipowners *opinion about* the course of the war.[1]

Several shipowners who expected an early end to the war ordered large steam-auxiliary ships early in the conflict. They were designed to sail and steam directly from southern ports to Liverpool, replacing the prewar system that carried southern products to New York and finished goods back. The design of several of the early war southern steam-auxiliary ships was similar to clippers built for service to Australia, but of shallower draft. The southern steam clippers were diverted to other

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[1] Soley, Blockade and the Cruisers, pp. 154-157.

service when New Orleans was captured and Mobile closely blockaded. Several steam-auxiliary clippers carried cargo to the island entrepots for transhipment to short-voyage runners.

Southerner was such a ship. She was a large clipper-built vessel launched March 8, 1863, from the yard of Pearse and Lockwood for Fraser, Trenholm & Company of Charleston. Southerner was the largest vessel launched on the Tees River to that time. She was framed in iron and planked in wood. Southerner was thus one of the first composite-built hulls. She measured 294 feet, 8 inches long between perpendiculars (310 from figurehead to stern), 38 feet,2 inches in breadth, and 22 feet in depth of hold, 1953 tons by builder's old measurement, and 2090 tons register. She had a single screw driven by direct-acting engines, 40 inches in diameter with a 33-inch stroke, producing 300 horsepower. The engines were constructed by Messrs. Fossick and Hackworth and "fitted with superheating and feedheating apparatus and other recent improvements." She attained a speed of twelve and one half knots on her trial trip June 3, 1863.[2]

The steam auxiliary clipper Georgiana, which became a blockade runner, was suspected of being a commerce raider by the Federal Consul in Liverpool, England. He may have been correct in his suspicions, as steam auxiliaries were suited for conversion, but no proof has been located and Georgiana was lost on her first run into

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[2] "Launches of Steamers: 'The Southerner'" in The Artizan (April 1, 1863), p. 63; "Steam Shipping: The 'Southerner'" in The Artizan (July 1, 1863), p. 165.

the Confederacy. Few steam-auxiliaries proved useful as blockade runners but some found use in the blockade system carrying cargo between Great Britain and the island entrepots.[3]

Southerner and Georgiana were the most prominent examples of the large steam-auxiliary clipper type. A full sailing rig could be augmented by steam power when needed. Bermuda, Bahama, and Memphis were more ordinary long-distance steamships fitted with light sailing rigs to augment their primary steam propulsion. The ships, intended to serve southern ports in anticipation of a swift end to the war, were instead primarily used to carry cargoes to the island entrepots.

Bermuda and Bahama were large propeller ships with auxiliary sailing rigs ordered by Fraser, Trenholm & Company from Pearse and Lockwood, of Stockton-on-Tees. Though unsuitable, one of the pair ran the blockade into Southern ports. They were large, deep draft, single-screw, sisterships built in 1862. Bermuda and Bahama were flush-decked with high freeboard and light barkentine rigs without bowsprit. The only deckhouse was an enclosed charthouse between the funnel and foremast. They measured 215 feet long, 29.2 feet in breadth and 20 feet in depth of hold.[4]

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[3] William H. Dabney to William H. Seward, February 13, 1863, no. 5, Teneriffe Consular Despatches, RG 84, NA.

[4] Bradlee, Blockade Running During the Civil War, facing p. 9.

Memphis was representative of a more common type of cargo vessel. She was a single-screw steamship with a light brig rig. William Denny and Company built the ship in 1862, sharing ownership on their own account with the blockade runner Thomas S. Begbie. She measured 230 feet long, 30 feet in breadth and 19 1/2 feet in depth of hold. She displaced 1780 tons and measured 860 deadweight tons, 1010 gross and 792 net register tons. Memphis' 705 indicated horsepower engine could drive her at 11 1/2 knots for nine days with 204 tons coal. Her large size, moderate speed, and intermediate range reflected the "short war" idea, and showed little regard for the blockade.[5]

The Blockade Running System

Pessimistic, or perhaps realistic, shipowners ordered small, stealthy, extremely fast steamships designed to voyage between the Confederacy and nearby neutral ports. These fast steamers carried cargoes through the blockade. Ordinary merchantmen connected the neutral entrepots with European ports. Confederate purchasing officer, Major Caleb Huse wrote, "it is impossible . . . to obtain vessels with capacity for cargo and speed for attempting the blockade." He attempted to purchase a "very fast paddle-wheel steamer, to run from Nassau to the coast" carrying supplies brought by

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[5] Painting in the collection of the Mariners' Museum, Newport News, Virginia; Lyon, The Denny List, p. 73.

larger, slower vessels, but could not obtain funds. Later operators used his idea to utilize the best qualities of two ship types in a blockade running system.[6]

The first blockade running company to deliver a custom blockade runner was represented on the southern end by Tom Taylor, a brilliant young businessman from Liverpool. He said of the change to specially built runners that, "the day of sailing vessels and ordinary trading steamers was over; accordingly steamers of great speed were ordered to be built expressly for the service."[7]

The demand for specially-built blockade runners was so great that runners were built in pairs, triplets or larger numbers to the same model and plans. Several classes of four identical runners were built, two classes had five ships each, and at least one class of eight near-sister ships was turned out. One group of four sister ships built by Jones and Quiggin of Liverpool was launched within a single half hour.[8]

Blockade runners began to be built to meet the demand. So many were needed that many ships were built to the same designs, creating mass-produced vessels. Several broad types of ships proved themselves against the blockade; shipbuilders sought to improve on earlier examples of each type with every new ship design.

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[6] Letter from Caleb Huse to Josiah Gorgas, April 1, 1862, ORN, II, vol. 2, pp. 177-180; Soley, Blockade and the Cruisers, pp. 42-43, 155.

[7] Taylor, Running the Blockade, p. 29.

[8] "Launch of Five Steamers on the Mersey," Illustrated London News, Supplement February 25, 1865.

Mass production saved time in the design and tooling stages of construction and therefore reduced costs. One set of moulds could be used to produce several vessels.[9] One blockade running company had contracts for eleven runners to be built within a period of seventy-five days, with a forfeiture of seventy-five pounds a day if late.[10]

As knowledge of the requirements of the trade grew, new runner classes improved markedly on earlier vessels. Blockade runners became more and more specialized. The performance of multiple examples of runner designs led to useful comparisons between various blockade runner types.

All of the custom-built, short-range blockade runners had certain features in common: high speed, shallow draft, moderate stowage, stealth features, and coal bunkers for three to six days steaming. Beyond these common features, runner designs varied in particulars such as the method of propulsion. Three propulsion systems met the demands of the trade: side paddle wheels, single screws, and double screws. Each system had its adherents and ships of all three types were built throughout the war.

Sidewheels were the most common propulsion system for runners. The weight of the machinery was always in the center of the ship's length, no matter what

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[9] David R. Macgregor, Merchant Sailing Ships, 1815-1850: Supremacy of Sail (Annapolis, Maryland: Naval Institute Press, 1984), p. 35.

[10] Samuel Barker to Thomas Savage, Havana, May 17, 1864, Havana Consular Despatches, RG 84, NA.

amount of cargo or coal was carried. They were the fastest early blockade runners. Glasgow clipper ship builder Alexander Stephens, built two sisterships, Fergus and Dare, in 1863 that attained twenty-two miles per hour on trial.[11]

Single-screw runners were the next most common type. They were less expensive than other types both in first cost and in operation. Although slower than other propulsion methods, single-screw propulsion systems were reliable and took up less room in the hull than twin-screws or sidewheels.

Double or twin-screw ships were introduced during the Civil War and revolutionized steamship propulsion. The first twin-screw to cross the Atlantic was the blockade runner Flora in 1862. Many other twin-screw blockade runners followed.[12]

Ships built to run the blockade shared the qualities discussed in the preceding chapters in varying degrees. Blockade runner design sought to combine the most desireable characteristics into individual ships. The biggest difference in types was based on the choice of propulsion method, each calling for a different set of

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[11] Carvel, Stephen Of Linthouse, pp. 33-39, 42-46; "Another Blockade Runner," in Glasgow Mail, October 28, 1863; Alexander Stephens, Scribbling Diary, entries for July 22, 1863, and January 13, 1864, University of Glasgow Archives, Glasgow, Scotland; The Engineer, September 4, 1863, p. 150.

[12] "Shipbuilding and Marine Engineering on the Thames in the Victorian Era," Engineering, XVII (May 13, 1898) and XVIII (June 3, 1898), p. 526; Frank C. Bowen, "Shipbuilders of Other Days, No. 40 J. & W. Dudgeon of London," Shipbuilding and Shipping Record (July 13, 1950), pp. 52-54.

complimentary characteristics. Therefore, the following discussion of blockade runner development is organized by propulsion method.

Sidewheelers

Most ships built for the blockade running trade were sidewheel-propelled steamships. Both American and British coastal sidewheelers proved their value in service early in the war. Modifications of British coastal steamships were the first choice of British shipowners. They ordered new blockade runners built on the model with which they were most familiar, but with speed emphasized to an extreme degree. The fastest shallow draft ships were all sidewheelers; these ships were made very long and thin to coax the highest possible speed from the hull.

The early blockade runners were so extreme as to be dangerous. Several were lost and others had to be rebuilt after receiving storm damage. Not only were the hulls longer in proportion to breadth than nearly any built before, but their scantlings were reduced for speed rather than strengthened to support the overly-long hulls.[13] Every feature of design was subordinated to speed: cargo capacity was sacrificed to engine rooms and coal bunkers; hulls were made as light as possible, sacrificing

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[13] Report of RAdm Dahlgren to Gideon Welles, December 30, 1864, with enclosure of December 25, 1864, report from William Barrymore, ORN, I, vol. 16, pp. 143-145; Wilkinson, Narrative of a Blockade Runner, pp. 191-192; "The Double Disaster at the Mouth of the Mersey," Illustrated London News, Supplement, January 28, 1865, pp. 93-94; Farr, West Country Passenger Steamers, p. 198; Taylor, Running the Blockade, pp. 35-36.

strength; the security of auxiliary sailing rigs was sacrificed to invisibility; crew and passenger comfort was discounted to increase capacity.

The first extreme paddle runner was Banshee, built in 1862. Banshee was revolutionary in many features of her design. She was the first steel vessel to cross the Atlantic. The hull had a length-to-beam ratio of nearly eleven to one. It had a knife-like bow; a very long, sharp entrance; well-rounded bilges amidships with a flat bottom; and a very long run aft to the counter stern. She was 214 feet long and 20 feet beam, 10 feet depth of hold, 217 net tons, and drew 8 feet of water. Four watertight bulkheads were fitted: a collision bulkhead about thirty feet aft of the bow, bulkheads at each end of the combined boiler and engine room, and a bulkhead about thirty feet from the stern. The holds had a capacity of about 200 tons and the coal bunkers held another 100 tons.[14]

A minimal schooner rig provided a steadying effect for greater speed when steaming, but was hardly large enough to move Banshee when under sail alone. The masts were long, tapering poles without yards, supported by "the least possible rigging." The deck was flush with a turtleback covering forward. A light-weight bridge between the paddleboxes supported the ships wheel. A deckhouse aft held the galley and provided cabins for the deck officers. Engineers had cabins amidships,

[14] Taylor, Running The Blockade, pp. 33-36, 40-41; plans of ship as USS Banshee, Cartographic Branch, National Archives, Alexandria, Virginia; H. Philip Spratt, Transatlantic Paddle Steamers, 2nd ed. (Glasgow: Brown, Son & Ferguson, Ltd., 1967), pp. 68-69; Charles R. Haberlein, Jr., "Former Blockade Runners in the United States Navy" (B.A. thesis, Kalamazoo College, Kalamazoo, Michigan, 1965), pp. 15-19.

and the crew and stokers berthed forward. Her crew included three engineers and twelve firemen for a total complement of thirty-six.[15]

The boilers were placed fore and aft of the paddlewheels and topped with short, thin smoke pipes. The boilers were built very low for protection against shot but they had insufficient room for steam and had to be modified. The boiler furnaces burned about thirty tons of coal per day under full steam giving about three-and-a-half days of steaming. Laird's built the engines of Banshee for Jones and Quiggin, who only built hulls and superstructures. Two oscillating cylinders were placed directly below the paddleshaft and measured 52 inches in diameter with a 48-inch stroke. They were rated at 120 nominal horsepower and developed 350 indicated horsepower from steam at 30 lb. per square inch.[16]

The most radical aspect of Banshee's design was her steel hull construction. Jones and Quiggin designed Banshee to test the theory that a ship built of steel could be built lighter than any other. Materials testing had shown that steel plates were generally four to eight times stronger than iron. With the knowledge that steel was stronger came the idea that thinner plates could be used in ship-building to save weight. The steel shell plates of Banshee's hull were only 1/8 and 3/16 inches thick.

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[15] Taylor, Running The Blockade, pp. 33-34.

[16] Taylor, Running The Blockade, pp. 33-36, 40-41.

In practice, the inconsistencies in steel production quality caused plates to fail long before theory predicted.[17]

Banshee's very light hull plates allowed great speed but proved to be too light and weak on the open sea. The plates buckled and bent in a seaway. Banshee nearly foundered while trying to cross the Atlantic and had to put back to Queenstown for repairs and strengthening before completing the crossing. After repairs and improvements, Banshee became a very successful runner, penetrating the blockade fourteen times before being captured. The U.S. Navy lost little time in converting their new acquisition into a gunboat to run down her former sisters.[18]

The successful design of Banshee was imitated in a number of similar extremely-fine-lined vessels built in Liverpool. Several near-identical sister ships were built by Jones and Quiggin over the next two years. Lucy and Wild Dayrell were identical sisters of Banshee and the highly-successful sisters, Badger, Lynx, Owl, and Bat, were slightly longer, broader, and lighter draft, near-sisters.[19]

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[17] Taylor, Running The Blockade, pp. 33-34; Abell, The Shipwright's Trade, pp. 147-148; Thomas Walton, Steel Ships: Their Construction and Maintenance, 6th ed. (London: Charles Griffin and Company, Ltd, 1920), pp. 1-16.

[18] Taylor, Running The Blockade, pp. 33-36, 40-41; manuscript logbook of USS Banshee, National Archives, Washington, D.C.; plans of ship as USS Banshee, Cartographic Branch, National Archives, Alexandria, Virginia; Haberlein, Former Blockade Runners, pp. 15-19.

[19] Extracts Received by Acting Rear-Admiral S.P. Lee, from U.S. Consul at Liverpool, dated November 13, 1863 included in Halifax Consular Despatches, RG 84, NA; "Trial Trip of the 'Lucy,'" The Artizan (November 1, 1863), p. 260; Wise, Lifeline of the Confederacy, pp. 289, 290, 310, 315, 326.

Fergus, which ran the blockade under the name Presto, and her sister The Dare were also in the extreme group of runners. Built by the experienced clipper ship builders, Alexander Stephens of Glasgow, they were very fast, traveling at more than 20-1/2 knots on their trial trips. Presto and The Dare were built on the same model and had identical engines, but were built for different owners and varied in their deckhouses and fittings. Presto had an Aberdeen stern; The Dare had a traditional deckhouse right aft. The two ships were 211 feet long, 23.1 in beam,and 9.4 in depth of hold. Secrecy was so important that they were launched at night in mid 1863.[20]

The Blockade Runner Model

Most of the extreme paddlewheelers were fast and made successful runners but were flawed in some aspects of design and construction. Too much was sacrificed to speed: the hulls were too long in proportion to beam; their scantlings were too light, although built of steel; and the cargo capacity was not sufficient. The flaws of the early extreme runners were recognized and corrected by late 1863. The mature design, known as the "blockade runner model," was developed from the early

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[20] Carvel, Stephen Of Linthouse, pp. 33-39, 42-46; "Another Blockade Runner" in Glasgow Mail, *October 28, 1863; Alexander Stephens, Scribbling Diary, July 22, 1863,* and January 13, 1864, University of Glasgow Archives, Glasgow, Scotland; The Engineer, September 4, 1863, p. 150.

extreme vessels. Merchant marine captains considered the result to be the ideal blockade running steamship.

Large numbers of fast sidewheelers with the same general proportions were built during the war; perhaps as many as 150 ships were built to the "blockade runner model." The ships of this type built during the middle years of the war, such as Julia, Will-of-the-Wisp, Stormy Petrel, Mary Bowers, Let Her Rip and their sisters, had a great deal in common. Their measurements ranged from about 210 to 240 feet in length; their length-to-beam ratios averaged about nine to one; and their drafts were less than nine feet. The ratio of horsepower to tonnage remained the same or slightly below that of the early extreme models.

The mature designs of the "blockade runner model" had larger hulls with less extreme proportions. Larger ships were just as fast and could carry much larger cargoes, allowing a greater profit on each successful run through the blockade. Discoveries and innovations in painting and structural design made them harder to detect. The requirements of trade and the limitations of technology caused many of these ships to resemble one another. Some ships built by different yards could only be distinguished from one another by fine details of proportions and by cosmetic features such as paddlebox decoration patterns.

Many ships were true sister ships; shipbuilders produced several ships from each design. Many naval architects and shipyards were hard pressed to meet the demand: multiple ships were built from most blockade runner plans. Even

experimental ships were built in pairs. Proven designs were used repeatedly for new vessels; up to nine ships were built to some designs. Another new innovation in merchant practice spread contracts for single ship classes to multiple shipyards.[21] Some successful designs, such as the Bat and Owl class, were built in as many as five shipyards.

The largest class of blockade runners built during the Civil War was composed of at least nine and possibly eleven ships. Jones and Quiggin received contracts for at least six of the Owl class. They built Owl and Bat in their yard and subcontracted Deer and Dream to W.H. Potter and Stag and Secret to Bowdler, Chaffer & Company. All six ships were true sisters built on the same model. Even the steamers built by Jones and Quiggin were cooperative ventures between companies, they only built hulls and subcontracted machinery to James Jack and Company and Laird and Sons.

Armstrong and Bella were sisters built by Thomas Wingate; Tartar, b)Emily built by Henderson and Coulborn also appears to be a sister due to very similar measurements, although there is little beyond circumstantial documentary evidence.[22]

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[21] Warships, such as the Royal navy Crimean War gunboats, had been built in classes prior to the Civil War. D.K. Brown, Before the Ironclad: Development of Ship Design, Propulsion and Armament in the Royal Navy, 1815-60 (Annapolis, Maryland: Naval Institute Press, 1990), pp. 145-150; Robert Gardiner, ed., Conway's All The World's Fighting Ships, 1860-1905 (New York: Mayflower Books, 1979), p. 107.

[22] "Steamship Building on the Clyde," The Artizan (January 1, 1865), p. 21.

Two more sidewheelers had a similar appearance and measurements. Virginia and City of Richmond, built by John and William Dudgeon, of London, may have been sisters built to the same contract requirements. They appear to have had finer lines and possess quarter galleries not fitted to the others.

The dimensions of all but the Dudgeon-built pair of these ships match closely enough to give probable cause to believe that they were built from the same model or plans. Dimensions of the "class" all were near 230 or 231 by 26 to 27 by 10.5 to 12 feet depth of hold. (These measurements are rounded off.) Tonnages of the Owl group were around 465 gross, 299 register, 771 burden (sometimes quoted as 800). Dream and Secret were 466 gross and 800 tons burden. All appear to have had vertical oscillating engines of 180 nominal horse power. The superstructures of the Owl class varied in styling according to the practices of the individual yards. In general, they all were sidewheelers with funnels fore and aft of the paddleboxes, gently curved stems, two-mast polacca schooner rigged, with elliptical sterns (the Dudgeon ships included quarter galleries).[23]

The Dudgeon sisterships were Virginia and City of Richmond. They were iron sidewheelers completed in 1864. Both were fast, successful runners that

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[23] Comparisons and conclusions drawn from multiple sources. Contemporary engineering newspapers provided the majority of this information; shipyard hull lists in Clyde Built Ships, held at Glasgow University Archives, Glasgow, Scotland, were consulted for all but the Jones, Quiggin and Dudgeon yards. Appendix 22 of Wise, Lifeline, is the best single source for ship measurements for comparison.

survived the war. Virginia was completed first and ran the blockade six times.[24] City of Richmond was completed in time to run the blockade but was diverted at the request of the Confederate Navy Department. She carried the armament, officers, and crew from England to meet and arm CSS Stonewall. City of Richmond was so delayed by her diversion that she arrived in the West Indies too late to run the blockade.[25] City of Richmond was an extreme runner, with a plain, curved bow, flat-topped paddleguard houses, sharply raking funnels fore and aft of the paddleboxes, and a counter stern fitted with false quarter galleries.[26]

Another large group of similar runners was built by Caird & Company, of Greenock, who built ten ships that became blockade runners but only two known to have been designed as such. The company began work as marine engineers early in the 19th century and began building ships in 1840. Caird was known for building fast ships including many coastal and river vessels and many large steamers for the Peninsular and Oriental Line. They built the first vessel partly of steel on the Clyde,

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[24] Wise, Lifeline of the Confederacy, p. 325.

[25] James D. Bulloch to William G. Crenshaw, December 18 and 20, 1864, and reply December 19, 1864, and Bulloch to Hunter Davidson, January 10, 1865, ORN, I, vol. 3; Wise, Lifeline of the Confederacy, p. 294.

[26] Photo CDV in the M.P. Usina Collection of the Museum of the Confederacy, Richmond, Virginia.

Windsor Castle in 1859. The Cairds kept abreast of the leading edge of ship-building technology.[27]

Two blockade runners built by Caird were City of Petersburg and Nola. They were sisterships measuring 228.4 feet long, 25.2 feet in beam, 13.5 feet in depth, 432 net tons, 601 gross tons, and 780 tons burthen. The were powered by a pair of condensing oscillating engines fifty-eight inches in diameter producing 250 nominal horse power. The engines were fitted with Caird's patent expansion gear. Caird's expansion gear allowed engineers to keep steam pressure up, adjust the steam valves easily for any desired expansion, and saved fuel over other valve gear systems. They had tubular boilers before and after the engines. Nola traveled sixteen knots on her trial trip but was lost in an accident at Bermuda on New Year's Day, 1864.[28] Nola and City of Petersburg used forced draft for the boilers, or "fanners in the stoke holes," as a newspaper report called them, for greater steam production. To lower their silhouettes they carried "telescope funnels" and hinged masts. City of Petersburg loaded with "patent fuel" for the trip to the American coast. A reporter

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[27] Shipbuilding and Shipping Record, September 22, 1949, p. 352; Frank C. Bowen, "Shipbuilders of Other Days: No. 35-Caird of Greenock," Shipbuilding and Shipping Record, September 22, 1949.

[28] The Artizan, October 1, 1863, p. 237; The Engineer, December 4, 1863, p. 334 and July 3, 1864, p. 8, and loss reported on February 19, 1864, p. 120.

noted that, "she is named after a town in South Carolina, and not after the capital of the Czar."[29]

Nola was approximately five tons smaller in tonnage than City of St. Petersburg. The difference in tonnage may be between Nola's raking straight bows and City of St. Petersburg's clipper bows or between slightly different deckhouses. Nola was reportedly built on the model of Lord Clyde which had proved successful after being sold for blockade running. She was launched on September 12, 1863 for "Captain McNutt of Glasgow."[30]

Regional Differences in Design

Small differences in design reflected the experience, prejudices, and creativity of different shipyards and ship-building regions. In general, blockade runners built on the Clyde were more strongly built than those on the Mersey. Many Clyde-built ships had clipper bows and quarter galleries, and most had short thick funnels

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[29] The Engineer, October 23, 1863, p. 250; "Additional Report of Commander Pierce Crosby," Report of the Secretary of the Navy (Washington: Government Printing Office, 1864), pp. 177-178; Wise, Lifeline of the Confederacy, p. 293.

[30] Field drawings of bow of Nola's wreck, by Chris/Cal, August 13, 1986, East Carolina University/Bermuda Maritime Museum Field School in Underwater Archaeology, courtesy of Bermuda Maritime Museum; drawings of Caird engine, The Engineer, July 3, 1863; "The City of St. Petersburg," The Engineer (October 23, 1863), p. 250; Freeman H. Morse to W. H. Seward, No. 70, June 19, 1863; No. 87, August 7, 1863; no. 97, September 16, 1863; No. 101, September 25, 1863; No. 109, October 16, 1863, London Consular Despatches, RG 84, NA.

compared to those from Liverpool. The paddlebox houses of Clyde runners were generally angular in form.

Blockade runners built on the Mersey, in Liverpool and Birkenhead, were generally more streamlined in appearance than those from other regions. Funnels were longer, thinner and more sharply raked than those of most Clyde-built boats. Jones and Quiggin of Liverpool, the largest builder of blockade runners, particularly affected the designs of vessels built on the Mersey. The ships that they subcontracted out to other Mersey shipyards were built to their plans and specifications. Working directly from the plans of the dominant shipbuilder in the region gave these yards a thorough knowledge of their proven designs. The mature Jones and Quiggin designs were recognizable by their gently rounded, streamlined paddlebox houses and their moderate, somewhat full lines.

Gulf Coast Shallow Draft Sidewheelers

One major design variant allowed sidewheelers to operate on the shallow Gulf Coast of the Confederacy. As the war progressed British and American river steamers became worn out, were lost, or were captured. Brand-new, specially-built, very shallow-draft, high-speed sidewheelers replaced them. They were described by blockaders as "very fast steamers of trifling draft . . . built in England expressly for

the purpose." The trade began in a purely commercial manner but by the last year of the war the Confederate Government operated runners in the Gulf as well.[31]

The Navy Department recognized the vulnerability of Wilmington and Charleston and sought to open other ports in the Gulf of Mexico. Apalachicola, Florida was mentioned occasionally as a potential blockade running port for very shallow vessels. The possibility of steaming up the Chattahoochee River to Columbus, Georgia, from Apalachicola was mentioned for runners drawing less than five feet of water. There was also a report in January 1865 that the Confederate Government ordered the entrances to St. Marks, Florida, buoyed so that steamers could enter at night.[32]

The largest group of "trifling draft" runners was a six-ship class of identical sisterships built by John Scott and Son of Greenock. The yard was known for building experimental ships and for employing new methods of ship-building.[33] The

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[31] Quoted in Soley, Blockade and the Cruisers, p. 108.

[32] Letter from Mallory to J.N. Maffitt, February 24, 1865, in Bradlee, Blockade Running During the Civil War, pp. 130-132; William T. Muir to W. H. Seward, January 9, 1865, Havana Consular Despatches, RG 84, NA; Maxine Turner, Navy Gray: A Story of the Confederate Navy on the Chattahoochee and Apalachicola Rivers (Tuscaloosa: University of Alabama Press, 1988), pp. 226-227.

[33] John Scott and Son of Greenock was the oldest yard operating on the Clyde by 1860. Various family members operated the yard from 1711 until 1969. The yard was known for building experimental ships and for employing new methods of shipbuilding. Scott owned and operated a brass and iron foundry named the Greenock Foundry after 1859. The Greenock Foundry built engines for ships built by Scott and other yards. Seven Scott ships were involved in the War Between the States. The prewar passenger sidewheeler, Flora(II), was converted to run the blockade in addition to the class of six

six Scott-built sidewheel sisters were named for the Waverly novels of Sir Walter Scott: Constance Decima (Constance), Ivanhoe, Talisman, Red Gauntlet, Marmion, Elsie. Their register dimensions were 201.4 feet long, 21.1 feet broad, 9.5 feet depth of hold, 266 gross tons, and 308 net tons. They drew only about five feet of water. The Waverly sisters had clipper bows, two-mast polacca rigs, tall, thin funnels fore and aft of the paddleboxes, and counter sterns. The paddleboxes had integral sponson houses faired in fore and aft of the paddle housings. The engines were built by the Greenock Foundry Company and produced 120 nominal horsepower.[34]

The Scott ships must have been lightly built. At least one, Talisman, foundered at sea in late December 1864. Owned by private stock companies, the Scott ships ran the blockade successfully on both the Atlantic coast and in the Gulf, wherever profits were highest and risks the least.[35]

Another pair of sidewheelers for service in the Gulf was built by John Laird & Sons, of Birkenhead. Lark and Wren were shallow-draft runners ordered by Captain

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sister ships built for the trade in 1864. Two Centuries of Shipbuilding, 1950; Walker, Song of the Clyde, pp. 53-55, 226.

[34] The Engineer, 17 (1864), pp. 254, 332 and 18 (1864), pp. 16, 210, 232; The Royal Gazette of St. Georges, Bermuda, January 3, 1865; woodcut of Ivanhoe reproduced in Caldwell Delaney, Confederate Mobile (Mobile, Alabama: Haunted Book Shop, 1971) n.p.; drawing by George F. Waterman, 1902, reproduced in Civil War Naval Chronology, 1861-1865 (Washington, D.C.: U.S. Government Printing Office, 1971), pp. VI-73.

[35] Constance and Elsie were owned by Alexander Collie & Company; Ivanhoe was owned by Thomas Sterling Begbie; the remainder were owned by the Albion Trading Company.

Bulloch for the Confederate government, through Fraser, Trenholm & Company. They were "specially designed for the shoal waters of Texas and Florida." The hulls were built of steel, "so as to combine lightness with strength" and divided into five or six watertight compartments for safety. Each could carry 350 bales of cotton and three days' fuel on a draft of only five feet, or up to 700 bales on a draft of six feet.[36]

Laird's specifications book lists Lark and Wren at 211 feet long, 23 feet in beam, and 10'9" in depth, with a tonnage of 552 tons. Their two-cylinder, diagonal oscillating engines were designed for 120 nominal horsepower. When loaded to six feet, Lark and Wren were designed to steam at eleven knots. Four days' coal, sventy-five tons, could be carried in the bunkers. Special holds alongside the engines and boilers stowed forty to eighty bales of cotton for protection of the engine and boiler room. In addition to the engine room protection, 500 bales could be stowed in the holds and another 120 on deck. An unusual feature for the time was the provision in the contract of two steam winches for working cargo. The keel for Lark was laid July 9; she was launched October 29; and sailed on December 9, 1864. Wren's keel was laid August 1, 1864; she was launched November 19, 1864; she sailed on January 2, 1865.[37]

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[36] Bulloch, Secret Service. vol. 2, p. 239.

[37] Contract, yard specifications, and engine plans, for yard Nos. 317 and 318 from Laird, Specifications Book, Cammell Laird Archives, Birkenhead, England, pp. 121-125, 275-278.

Lairds benefited by experiences gained on the Mersey in steel ship-building. Lark was described by the U.S. Consul General in Havana as "one of the finest blockade runners that has come into this port." She proved to be both fast and strong when she sailed in the Gulf of Mexico. On her second trip into Galveston Lark went aground and lay broadside-to on the beach for a week. When she was worked free the structure was found to be sound, and after repairs to her paddlewheels and hull plating "dished" by wave action, she ran back to Havana in seventy hours with a cargo of 793 bales of cotton on board. The engineering journal The Artizan reported the voyage under the heading "What a Steel Steamer Can Do."[38]

Another, larger pair of very light draft runners followed from Lairds. Hornet and Wasp were sisterships built in 1865. They were sidewheelers measuring 250 feet long, 28 feet in beam, 10.9 feet in depth of hold, 573 gross tons, 770 tons burden, and 290 tons register. Neither was finished in time to run the American blockade.[39]

The Final Generation of Sidewheelers

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[38] William T. Minor to William H. Seward, Despatch No. 31, January 19, 1865, Havana Consular Despatches, RG 84, NA; "What a Steel Steamer Can Do," The Artizan (June 1, 1865), p. 140; Richard Garrett, Builders of Great Ships (Birkenhead, England: Cammell Laird & Company [Shipbuilders and Engineers], Ltd., 1959), passim.

[39] Contract, yard specifications, and engine plans for yard Nos. 319 and 320 from Laird Specifications Book, Cammell Laird Archives, Birkenhead, England, pp. 126-129, 279-282.

The final generation of paddlewheel runners were the largest of the war. As shipowners became willing to risk more capital in blockade running, the vessels got larger. Enlarged "blockade runner model" steamers were built on the Clyde, the Mersey and the Thames. These ships measured between 250 and 280 feet long, each of them could carry more cotton than four of the early extreme model sidewheelers.[40] Ships such as the sisters Hope, and Colonel Lamb; Rosine and Ruby; and the five ship Falcon class, measured from 270 to 280 feet long. Very powerful engines propelled the large, full-lined "ultimate" runner hulls at speeds as great as their sharper, smaller companions. At least one class was given engines that were too powerful. The Falcon class was so overpowered that at least three of the five sisterships dismounted their engines: in heavy seas the engines literally moved faster than the hulls.[41]

In 1864 Aitken & Mansel built three sidewheelers to the same dimensions entirely of Bessemer steel. They were Florence, Susan Beirne, and Banshee(II). They were 252.6 feet long, 31.2 feet in breadth of beam and 11.2 feet in depth of hold. They were all fitted with 250 nominal horsepower engines built by J. Aitken and Company of Cranston-Hill. Florence, hull no. 4, was launched late in 1864, but

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[40] Banshee carried about 450 bales of cotton, while Colonel Lamb carried over 2000; each full bale held between 500 and 650 pounds of cotton.

[41] See Chapter 2 regarding this class.

repairs before her departure required so much time that she never ran the blockade.[42] Susan Beirne, hull no. 6, and Banshee(II), hull no. 9, both were completed in time to attempt the blockade. Banshee(II) made eight successful runs and survived the war; Susan Beirne damaged her hull while attempting to enter Wilmington for the first time and was unable to try again before the war ended.[43]

In 1865 William Miller & Sons built three advanced sidewheel blockade running sisterships similar to the Aitken & Mansel Florence class steamers. Abigail, Ray, and Lelia were flush-decked with raised forecastle and quarter decks. They had vertical stems and counter sterns with two-masted gaff schooner rigs. They were 252 feet long between perpendiculars and 265 feet long overall, had a 30-foot beam, and 12.5-foot depth of hold.[44]

The two cylinder vertical oscillating engines were rated at 300 nominal horsepower and produced 1,950 indicated horsepower. Double-ended boilers fore and aft of the engines produced steam for the main engines and the donkey engine. The donkey engine drove pumps and auxiliaries when the main engines were not required. Steam bound for the main engines passed through an annular superheater fitted around

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[42] The Artizan, December 1, 1864, p. 285; "Steamship Building on the Clyde," January 1, 1865, p. 21.

[43] "Aitken & Mansel," Clyde Built Ships: List No. 8, Glasgow University Archives; builders' half block model, 1:48 scale, Museum of Transport, Glasgow; Sprunt, Derelicts, p. 127, 199; Wise, Lifeline of the Confederacy, pp. 290, 300, 322.

[44] "The Steamer "Lelia," The Artizan, (February 1, 1865), p. 45.

the exhaust uptakes. Excess steam was normally vented through the safety valves and steampipes attached to the funnels but could be vented through the hull when more quiet was needed. The engines drove patent feathering paddle wheels. The engines for Lelia were built by Fawcett, Preston, and Company and those of Ray and Abigail were built by James Watt & Company.[45]

The only trial trip of the three sisters recorded listed Lelia's trial speed at eighteen miles per hour. Lelia was finished well before her other sisters. She left Liverpool prepared to cross the Atlantic and run the blockade, loaded with 700 tons of coal. A January North Atlantic gale caused her to founder just outside of Liverpool with the loss of twenty lives. Her sisters Abigail and Ray were finished too late to run the American blockade. One of these ships was later armed and became the Brazilian Navy, second class sloop, Leopoldina.[46]

The Falcon, Flamingo class built by Randolph, Elder & Co. of Fairfield, England, was powered by the largest machinery plant built for blockade runners. The opinion of the three-funnelled productions of Randolph and Elder held by blockade running captains was that

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[45] "The Steamer 'Lelia,'" The Artizan, February 1, 1865, p. 45.

[46] "The Double Disaster at the Mouth of the Mersey," The Illustrated London News, Supplement, January 28, 1865; "The Steamer 'Lelia,'" The Artizan, February 1, 1865, p. 44; "Boilers and Oscillating Paddle Wheel Engines, 300 HP Collectively, Fitted in the I.S.S. 'Abigail' Constructed By Messrs. James Watt & Co.," in Bourne, Modern Marine Engineering, plate 30.

> . . . although they might attain a high rate of speed, they were not suitable in other respects. They were all machinery together, and had very little carrying space. They would consume a large amount of fuel; and when they took in a sufficient quantity of coal at Havana to take them to Galveston and back, they would be loaded down so deep that their speed would be much impeded, and they would have very little carrying capacity left for cargo. They would send up immense clouds of smoke, and be observed a long distance off. They would also be conspicuous when going through the blockading fleet during night, and their working expenses very high.[47]

The three-funnelled monsters proved to be overpowered, too expensive to run, and too conspicuous. Several of these extremely fast vessels had problems caused by the powerful engines dismounting themselves in the lightly-built hulls.

The two largest blockade runners built during the war were Hope and Colonel Lamb, both completed in 1864. They measured 281 feet, 6 inches by 35 feet by 15 feet, and 1,132 gross tons. The ships were two-masted, schooner-rigged sidewheelers with funnels fore and aft of the paddleboxes. The machinery was built by James Jack and Company, of Birkenhead. It consisted of a two-cylinder, oscillating engine, with cylinders 72 inches in diameter, with a 5-1/2 foot stroke. Surface condensers were placed between the cylinders along with the pumps. Sets of boilers fore and aft of the engines produced steam at twenty-five pounds per square inch. The engines produced 350 nominal horse power. The sidewheels were twenty-six feet in diameter, with ten patent feathering floats. Hope and Colonel Lamb both attained speeds of around 16-

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[47] Watson, The Adventures Of A Blockade Runner, p. 287.

1/2 knots on their trial trips. The two ships drew considerable attention and were widely reported as being the largest and best built steamers built to run the blockade.[48]

Hope was finished before Colonel Lamb and ran the blockade twice before being captured by the blockader USS Eolus, after a steam pipe burst. Colonel Lamb ran twice into Wilmington and attempted to run to Galveston after the Atlantic ports fell. Both Colonel Lamb and Hope survived the war and were later involved in other wars.[49]

Colonel Lamb was named for the intrepid and popular commander of Fort Fisher whose actions had saved many runners from destruction.[50] One paper reported on the new Jones and Quiggin, runner that

> A day or two since, the largest steamer ever built of steel was launched from this yard. She was named the Colonel Lamb. She is 1800 tons register, and, from the peculiarity of her build is admirably adapted for the

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[48] "Steel Paddle Wheel Steamer 'Hope,'" The Mariner, VIII, no. III (July 1934), pp. 74-76; Spratt, Transatlantic Paddle Steamers, pp. 72-73; Alan Raven, "Blockade Runner "Hope,'" Ships in Scale, July/August 1984, pp. 30-31, and September/October 1984, pp. 60-64, and November/December 1984, pp. 78-79.

[49] The Engineer, June 10, 1864, p. 364; Eric Heyl, Early American Steamers, vol. 4 (Buffalo, New York: n.p., 1965); W.A. Baker and Tre Tryckare, The Engine Powered Vessel From Paddle Wheeler to Nuclear Ship (New York: Grosset & Dunlap, 1965), p. 65; builders' (full hull) model, 1:48 scale, in collections of Merseyside Maritime Museum, Liverpool.

[50] Taylor, Running the Blockade, pp. 55-67.

> blockade-running business, for which it is rumored she is designed.[51]

Rosine and Ruby were the final pair of blockade runners produced by Jones, Quiggin & Co. in 1865. They were large sidewheelers, similar to Colonel Lamb and Hope but slightly smaller. The over all length was 270 feet, the length of keel and fore-rake was 260 feet, and the register dimensions were 261.1 feet by 33 feet by 15.6 feet; 900 gross tons, 1391 tons burden, and 500 tons register.[52] The silhouette that they presented was made less visible by using four small funnels in place of the two large funnels common on similar large runners. Small diameter funnels with minimal height were hard to see but produced less draft than was needed for the boilers. Undoubtedly, Rosine and Ruby were fitted with forced draft to allow the use of smaller funnels while keeping the fires hot. They were the only runners to possess four smoke stacks. The engines built by James Watt & Company were also unusual in design. Four small, seventy-five nominal horse-power oscillating engines drove the paddlewheels. This offered the advantage of redundancy in case of breakdown, but exacted a penalty in increased weight.[53]

Shipbuilders in Great Britain met the need for ships to run the blockade with ingenuity and dispatch. The majority of the steamships they built to run the blockade

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[51] The Engineer, June 3, 1863, p. 348.

[52] "The Launch of the 'Rosine,'" The Artizan, November 1, 1864, p. 261.

[53] Jones Quiggin builder's model of Rosine and Ruby, collection of Dr. Charles Peery, Charleston, South Carolina; Wise, Lifeline of the Confederacy, pp. 318-319.

were sidewheelers. Shipbuilders determined the best type of vessel for the trade with experimental steamships; they combined the most useful features to create the "blockade runner model." Those vessels were built using mass production methods developed to meet the large demand. Standard designs were adapted to meet requirements of different shipbuilders and planned operating areas. Near the end of the war, blockade runners grew in capacity while maintaining high speed and stealth features, producing a final generation of very effective steamships.

Chapter VI: BLOCKADE RUNNER TYPES: SCREW PROPELLERS

Propeller Ships

Large numbers of single-screw ships were bought for blockade running but few were built expressly for the trade. Single-screw ships that proved of good speed were often sold for the "Nassau trade." Only two single-screw runners were built with very sharp lines during the war. One, Phantom, was built for speed; the other, Little Ada, for operation in shallow water.

The propeller runner Phantom was the Mersey River prototype for a single-screw, high-speed blockade runner. Phantom combined many leading ideas about fast ships in a single design. She was extremely long in proportion to her beam and had powerful engines for a vessel of her size. She was built of steel by William C. Miller & Sons of Liverpool in early 1863. Phantom was built at approximately the same time as the runner Banshee, but was finished later, becoming the second steel ship to cross the Atlantic. Captain James Dunwoody Bulloch, the Confederate agent in Liverpool, was reported to have often visited the ship during building and made suggestions as to details.

Phantom was 192.9 feet long, 22 feet in breadth, and 12.4 feet depth of hold, with very fine lines. She measured 322 gross tons and 266 tons register. The government surveyor who examined the ship said that her hull was ". . . of the most

fragile character that can be conceived for a sea-going vessel, her steel plates being but a quarter of an inch thick, her iron frame of the same proportions."[1]

Phantom's hull had a very sharp entrance, a vertical stem curving out slightly at the sheer line, slack bilges with moderate deadrise, a long, fine run broken by the propeller aperture between the sternpost and rudderpost, and a counter stern. The lines were so fine that a visiting German naval architect, Gustave Hillman, recorded them in his study of clipper ships.[2]

Phantom's propeller was made as large as possible, placed between the stern and rudderposts in the modern fashion, with the rudder abaft the screw. The superstructure was minimal, with only two small sidehouses on deck amidships and a deckhouse aft. She was rigged with a two-mast polacca schooner rig with a single funnel amidships between the sidehouses. After one trip through the blockade Phantom's new owners, Fraser, Trenholm & Company, were disappointed with her performance compared to Banshee's. Apparently her speed was not sufficient. Fraser and Trenholm sold her in July 1863, to the Confederate government. She was

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[1] Lord Russell to Charles Francis Adams, in Papers Relating To Foreign Affairs in Message of the President of the United States, and Accompanying Documents, to the Two Houses of Congress 38th Congress, 1st Session, Ex. Doc. No. 1 (Washington, D.C.: Government Printing Office, 1864), passim and pp. 298-303.

[2] Gustave Hillman, plan of steel steamship built in Liverpool 1862, in collection of the Mariners' Museum, Newport News, Virginia; MacGregor, Fast Sailing Ships, pp. 208, 213, 229.

lost at New Topsail Inlet, North Carolina, on her next return trip. Fraser, Trenholm did not order any more propeller vessels.[3]

Greyhound was another early experiment in fast propeller ship design. She was built by Kirkpatrick, McIntyre of Greenock, Scotland, for R. Little of Greenock, who intended to use her for coasting on the coast of Australia. She was sold for blockade running after she achieved 13-1/2 knots on her trial trip.[4] Greyhound was

> a screw steamer of 523 tons, builders' measurement, . . . specially designed to attain a high rate of speed with a very light draught of water. She was named the Greyhound. Her dimensions are 200 ft. keel and forerake, 23 ft. beam, and 13 ft. hold. She is flush-decked, rigged with three pole masts, and is a rakish-looking craft. The Greyhound is divided into seven water-tight compartments, so constructed that, in the event of damage or accident, any two or three compartments may be filled without destroying her buoyancy. She is to be fitted with engines by Messrs. Caird and Co., Greenock, and is expected to be ready for trial in a week.[5]

Greyhound, like Phantom, failed to excite much interest in building more extremely fine-lined, single-screw vessels for blockade running. Shallow-draft, single-screw ships were not fast enough for blockade running. Interest in single-

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[3] Draft of Phantom (identified by the author) in Gustave Hillman Collection, The Mariners' Museum archives, Newport News, Virginia.

[4] The Artizan, December 1, 1863, p. 284, and February 1, 1864, p. 44.

[5] "Notes From The Northern and Eastern Counties," The Engineer, November 6, 1863, p. 278.

screw ships shifted from the extremely fine-lined examples, such as Phantom and Greyhound, to more moderate examples.

Aries and Georgianna were examples of more capacious single-screw vessels. The fuller lines of Aries gave her more than twice the tonnage of Phantom, although only ten feet longer. Aries was built of iron in 1862 by James Laing at Deptford, Sunderland. Her measurements were 202.3 feet long, 27.6 feet in beam, 15.6 feet depth of hold, 749 gross tons, and 479 tons register. She was rigged as a two-masted schooner and had a clipper bow.[6]

Georgianna had slightly finer measurements and proportions than Aries. She was described as "a powerful screw steamer of 407 tons and 150 horsepower." Georgianna was built by J.G. Lawrie and Company at Whiteinch in Glasgow. Her iron hull was brig rigged with one stack, a clipper bow with figurehead, and a jibboom. She measured 205.6 feet long, 25.2 feet in beam, and 14.9 feet depth of hold, 519 gross tons, and 407 tons register. Georgianna's "appearance" and the presence of gold braid on the officers' caps alarmed U.S. consul William H. Dabney at Teneriffe, when she called at the island for coal on her way to the Southern coast. He reported his fears that she was intended to be a Confederate cruiser.[7] There is

[6] Wise, Lifeline of the Confederacy, p. 288.

[7] William H. Dabney to William H. Seward, February 13, 1863, Teneriffe Consular Despatches, RG 84, NA; Wise, Lifeline of the Confederacy, p. 302.

little evidence to support his contention as the ship sank on her first trip into Charleston, before she might have been armed.[8]

Medium-sized and small blockade running companies continued to employ single-screw vessels after the large companies turned away from them. By using different tactics from the large blockade running companies, small companies made effective use of single-screw ships. Single-screw blockade runners were generally smaller and of lighter draft than sidewheelers, so that they could enter very small undeveloped ports on the Gulf and South Atlantic coasts. These ports were usually only lightly blockaded, allowing a better chance of evading detection. Most single screw runners employed in the Gulf were new vessels of moderate size built for other trades.

Minnie was an iron screw steamer built by Barclay, Curle and Company of Glasgow in 1863. She measured 181.1 feet long, 22.4 feet in beam, 12.1 feet depth of hold, 355 gross tons, and 253 tons register.[9]

Laurel was a shallow draft, single-screw steamer built in 1863 by Anthony and John Inglis in Glasgow, Scotland. She was built for service between Glasgow and Londonderry and sold in 1864 for use as a blockade runner. She measured 185 feet in keel and forerake, 207 feet long overall, 25 feet in breadth moulded, 13 feet in

[8] A South Carolina treasure salvor, E. Lee Spence, has asserted that she was to be armed as a cruiser; there is no conclusive evidence to support his claim either.

[9] Wise, Lifeline of the Confederacy, p. 313.

depth moulded, 296 tons register, 505 gross tons, 565 tons by builder's measurement. She was powered by a pair of piston-rod geared engines of 140 nominal horsepower. Laurel ran into Charleston in November 1864. She was officially transferred to Confederate government ownership and was renamed Confederate States. She made two runs through the blockade and served as a supply ship to the commerce raider CSS Shenandoah.[10]

The most successful single-screw runner was the little Pet, which ran the blockade sixteen times before being captured on the seventeenth run, headed for Wilmington. She was built in 1862 by Blackhouse in Middlesbrough, England, for the Steamship Pet Company. She measured 141 feet long, 20.6 feet in beam, 11.4 feet in depth of hold, 244 gross tons, and 171 tons register. She was reported to only make eight or nine knots and this may have led to her capture off Wilmington.[11]

The principal advantage of single-screw ships was that the initial cost was much less than for other steamers, requiring a smaller investment in a risky trade.[12]

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[10] Builder's Contract for "No. 7. Laurel, Glasgow & Londonderry Screw Steamer," Inglis Collection, and "Laurel Yard No. 7", A. & J. Inglis Hull list, Clyde Ship Lists, Glasgow University Archives, Glasgow, Scotland; "The 'Laurel' Screw Steamer," The Artizan (October 1, 1863), p. 237; Wise, Lifeline of the Confederacy, p. 308.

[11] Pierce Crosby to S.P. Lee, enclosure with information imparted by the "second engineer of Fanny and Jenny," ORN, I, vol. 9, p. 476; E.H. Faucon to S.P. Lee, February 16, 1864, pp. 486-487; Wise, Lifeline of the Confederacy, p. 316.

[12] Watson, Adventures of a Blockade Runner, p. 323.

Several small propeller vessels designed to operate on the Chinese and Australian China coasts were sold during building or upon completion to go blockade running.

NcNab & Company of Whiteinch on the Clyde built a series of small propeller steamers for the opium trade in China and for the coasts of Australia in the mid-1860s. Three of the series became blockade runners. The first ship McNab built was the blockade runner Beatrice, launched September 25, 1863. She measured 167.5 feet long, 24.1 feet beam, 12.65 feet depth of hold, 342 gross tons and 274 tons register. The next two blockade runners were the smaller sister ships, Julia and Emma, sold from a series of at least six similar vessels. They measured 155 feet long, 21 feet, 8 inches in beam, and 12.65, feet depth of hold, 282.91 gross tons, and 210.92 tons register. McNab built both the hull and engines for most of their vessels. Julia (and probably her sisters) was driven by a pair of direct-acting engines of 60 nominal horse power.[13]

At least one single-screw runner resembled an Aberdeen clipper. Aberdeen clippers were a type of small-to-medium-sized fast sailing vessel developed between the late 1830s and 1850 in the city that gave them their name. They were recognized by their very long, fine-lined entrance and very sharply raking, straight stempost.

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[13] Letter no. 9 of F.H. Morse to William H. Seward, January 16, 1863, London Consular Despatches, RG 84, NA; "Steamship Building on the Clyde," The Engineer (November 1, 1863), p. 260, (April 29, 1864), p. 270, and (August 12, 1864); The Artizan, October 2, 1863, p. 208 and November 1, 1863, p. 260; "Mexico," Nassau Customhouse Register, Eldredge Collection, The Mariners' Museum Archives; "Minor Yards:- Greenock 13, McNab & Co.," Clyde Ship Lists, Glasgow University Archives, Glasgow, Scotland.

Little Ada, built by William Simons and Company, was an elongated steamer version of an Aberdeen clipper.

Built in 1863, Little Ada was 120.5 feet long, 18.1 feet in beam, 10 feet in depth of hold, and 95/140 tons register. She drew only five feet of water fully loaded. Her hull form stretched the Aberdeen hull to allow room for machinery. Ordinary Aberdeen clippers had length-to-beam proportions of approximately five to one: Little Ada's proportions were about six-and-one-half to one. The Aberdeen schooner hull form was lengthened by an extended midbody and by a propeller aperture in the stern. She had a vertical, inverted, single-cylinder engine mounted well aft of amidships, with a cylindrical scotch boiler just forward. Little Ada was registered at Liverpool in 1864 and operated between Nassau and small ports on the Atlantic coast until she was captured off the coast of South Carolina in 1864.[14]

Twin-Screw Propeller Runners

The most innovative propulsion system of the 1860s utilized independent twin-screws. The pioneers of the system were the brothers John and William Dudgeon of London. Their marine engineering firm, the Sun Iron Works, was established in the

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[14] William Simons Collection, University of Glasgow Archives; "Little Ada," Eldredge Collection, Mariners' Museum; The Artizan, February 1, 1864, p. 44; Wise, Lifeline of the Confederacy, p. 309; Lt. Cmdr. A.W. Weaver to Com. Stephen C. Rowan, "Expedition for the capture of the Little Ada," Report of the Secretary of the Navy, 1864, pp. 306-307; for features of Aberdeen clippers see MacGregor, Fast Sailing Ships, pp. 107-141.

1850s. The Dudgeons were known for advanced designs and had produced the engines for a small twin-screw tugboat used in Dutch canals in 1857.[15] In 1862, the Dudgeons built a shipyard on the Thames on the Isle of Dogs. Their first ship was the 150-foot- long, independent twin-screw Flora, designed as a China Sea opium clipper-steamer. While she was being built, a more lucrative trade appeared. Flora's owners sent her to run the American blockade rather than to the China coast. Thus Flora became the first twin-screw steamer to cross the Atlantic Ocean.[16]

Flora ran the blockade at least eight times and received a great deal of attention following these successes. A Royal Navy Admiral said Flora "laughed at her adversaries; all the craft that have chased her on the American coast have been

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[15] Mr. Richard Roberts had first publicized the idea of twin-screws worked by independent engines in 1853, but they were not tried in any large vessels until Flora. Obituary for Richard Roberts, Transactions of the Institution of Naval Architects, vol. 4 (1864), p. xxvi; Philip Banbury, Shipbuilders of the Thames and Medway (Newton Abbot: David & Charles, 1978), pp. 63-70; N.P. Burgh, "Marine Engines From 1851 to the Present Time," in The Artizan (May 1, 1865), pp. 102-107.

[16] The Dudgeons wished to attract Admiralty orders and invited large groups of prominent naval officers to the trials of the twin screws. The Royal navy considered the innovation so important that it ordered a twin screw launch, Experiment, and a twin screw gunboat, Viper, from Dudgeon, and other twin-screws from other yards. Stanley Sandler, The Emergence of the Modern Capital Ship (Newark: University of Delaware Press, 1979), pp. 51, 86; "Shipbuilding and Marine Engineering on the Thames in the Victorian Era," No. XVII, May 13, 1898, and No. XVIII, June 3, 1898, p. 526; Frank C. Bowen, "Shipbuilders of Other Days, No. 40 J. & W. Dudgeon of London," Shipbuilding and Shipping Record (July 13, 1950), pp. 52-54.

left behind."[17] The Dudgeons received orders for seven more sisters to Flora. These ships, all named for goddesses, were slightly larger but with engines on the same pattern. They were attractive steamers with clipper bows and rounded counter sterns. John Dudgeon described the ships in 1865 for the Institution of Naval Architects and Marine Engineers:

> First, we built eight vessels of 425 tons and 120-horse power destined for blockade running. They have all been very successful in that hazardous trade, some running as many as a dozen times, the average number of runs being five. At their trial trips they showed the following results: with an indicated horsepower = 600 (attained by four cylinders 26 inches diameter by 21 inches stroke; steam 23 1/2 lbs.; vacuum 26 inches; revolutions 115). The vessels went 14 knots; the immersed midship section was then 150 square feet, and the displacement 400 tons; the consumption 15 cwt. per hour. All these numbers shew the mean of the eight respective trials of these vessels, which being sisterships, were on these occasions trimmed nearly all alike, and tried under equal circumstances . . . .
>
> The facility of maneuvering has been of very great service to these vessels in performing their duty. The fact is, it has saved them in many cases from being taken. The advantage of having two engines independent of each other has also manifested itself; when one engine was damaged, it was then stopped and easily repaired, whilst the other was going. Also, in going out, it was found saving to work alternately one engine and boiler, when the vessels still attained the fair speed of eight

[17] Admiral Belcher, R.N. in discussion of Paper by Captain T. E. Symonds, "On the Construction and Propulsion of Twin-Screw Vessels," in Transactions of the Institution of Naval Architects, V (March 18, 1864), pp. 188-209 and discussion pp. 209-216.

> knots. The greater part of these vessels have been chased and escaped, only one being taken; some have run ashore, some are still existing.[18]

Flora was 150 feet long in keel and forerake, 161.3 feet "aloft" or overall, 22.5 feet in beam, 12.4 feet in depth of hold, and had a 9 foot draft. Flora's tonnage by builder's old measurement was 395, 297 74/100 gross tons, 182 19/100 tons new measurement or register, and 430 tons burden. She had the highest length-to-depth ratio allowed by Lloyd's and one more bulkhead than the required four.[19] She was powered by horizontal, direct-acting, injection condensed, twin-cylinder engines, 26 inches in diameter, with a 21 inch stroke. They produced 120-nominal horse power. Her engines proved to be very successful; they were repeated in eight more ships.[20] Flora's sisters were built fifteen feet longer to allow more cargo and coal stowage.[21]

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[18] J.& W. Dudgeon, "Record of Performance and Experiences with Twin-Screw Steamers Built By J.& W. Dudgeon," in Transactions of the Institution of Naval Architects, VI (London: Institution of Naval Architects, 1865), p. 209.

[19] Lloyd's Special Survey Report, "Iron No. 2950, Double S.S. 'Flora,'" 13 November 1862, National Maritime Museum, Greenwich, England; Captain T.E. Symonds, "On the Construction and Propulsion of Twin-screw Vessels," Transactions of the Institute of Naval Architects, 4 (1864), p. 186; Joseph H. Ritchie, "Introduction to Lloyd's Revised Rules," Transactions of the Institution of Naval Architects, 4 (1863), pp. 289-302.

[20] "Marine Engines from 1851 to the Present Time," The Artizan, May 1, 1865, p. 106.

[21] The seven sisters were Kate (possibly first named Venus), Diana later Don, Aurora later Dee, Vesta, Hebe, Ceres, and Pallas later named Annie. For dimensions and construction data see Lloyd's Special Survey reports for Flora, Hebe, Kate, and Diana.

Twin-screw ships proved their value early in 1863 as the Dudgeon "goddess" sisters reached the American coast. They were faster, more maneuverable, and more economical than similar sized sidewheelers. Kate, the second Dudgeon twin-screw, burned only eleven tons of coal in twenty-four hours, which compares very favorably with sidewheelers requiring thirty tons a day.[22] An article on Kate's trial trip in the Shipping Gazette described her stealth features: "She carries two masts, lightly rigged, for fore and aft sails, each mast of wood, and fitting in an iron pocket just above the level of the hurricane house, and with parting joints. The funnel is also telescopic, so that the masts and funnel could be lowered on deck."[23]

The Royal Navy as well as English and Scottish naval architects paid close attention to the records of the Dudgeon twin-screw ships. The London Times reported that "So important, in fact, was the result of Flora's trial considered by the Admiralty, that their inspector of machinery afloat, Mr. John Dinnen, was present

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For details of Flora's trial trip on August 25, 1863, see The Artizan September 1, 1863, p. 212; for Kate's trial see "Trial Trip of the Kate," The Artizan, April 1, 1863, pp. 92-93; "The Aurora," Army and Navy Journal, September 19, 1863, p. 3; for further details see Report of Commander Donaldson to RAdm. S.P. Lee, January 11, 1864, ORN, I, vol. 9, pp. 402-405.

[22] Symonds, "Propulsion of Twin-screw Vessels," p. 186; "Trial Trip of the Kate," The Artizan, April 1, 1863, pp. 92-93; "Trial Trip of the Double Screw Steamship Kate," The Times (London), March 2, 1863; "Trial of the Hebe," The Artizan, May 1, 1863, p. 115; "Trial of the Hebe," The Times (London), April 28, 1963, p. 14; Taylor, Running the Blockade, p. 33.

[23] Enclosure from the Shipping Gazette, to despatch no. 32, letter of Freeman H. Morse to William H. Seward, Mar. 13, 1863, London Consular Despatches, Rg 84, NA.

officially to report the result for the information of the Board." The trial was also attended by representatives of the Peninsula and Oriental Steam navigation Company, Lloyd's, the Swedish Royal Navy, the Royal Navy, and "a large number of other officers and gentlemen interested in screw propulsion".[24]

Twin-screw propulsion was debated hotly by its many prominent adherents and its vociferous detractors. A former president of the Institution of Naval Architects and Chief Constructor of the Royal Navy, Sir Edward J. Reed, was a critic of twin-screws. In 1863 he said, "a single screw of a given diameter is more effective as a propeller than two screws of a given diameter together." Another prominent detractor was Rear Admiral Halsted, R.N., who called them "half-screws," and suggested that much time and money was being thrown away on the system.[25]

Supporters of the twin-screw system won out, however; the experience gained with blockade runners employing two propellers assured their permanent acceptance. Admiral Sir Richard Belcher, R.N., controlled the trials of many Dudgeon vessels and was impressed by their low coal consumption and remarkable maneuverability. He described the maneuverability as like that of a pendulum when moved by the

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[24] "Dudgeon's New Double-screw Steam-ship Flora," Illustrated London News (November 29, 1862), p. 587; "Trial of the Screw Launch Experiment," The Artizan (December 1, 1863), p. 282; "The Twin Screw Launch "Experiment," The Engineer (November 13, 1863), p. 292; "The Trial Trip of the Aurora, Twin Screw Steamer," The Artizan (September 1, 1863), p. 212.

[25] Symonds, "Twin-Screw Vessels," pp. 185-209; "Discussion" of the paper by J. Dudgeon, and E.J. Reed, pp. 210-212.

screws without the aid of the rudder. Captain Augustus Charles Hobart-Hampden, R.N. ran the blockade successfully six times in the Dudgeon twin-screw Don, said she turned "like a teetotum," and that the ability saved her from capture more than once.[26] Captain John Wilkinson, commander of Chameleon, said of her propellers, "Nothing saved us from capture but the twin-screws, which enabled our steamer to turn as upon a pivot. . ."[27]

Henderson and Coulbourn, of Renfrew, also built several early independent twin-screw ships. The first was Coquette, a large, advanced, twin-screw steamer built in 1863. Bought by James Bulloch when completed, she was the first twin-screw owned by the Confederate government. Confederate naval officers were impressed by her performance and recommended twin-screw propulsion as their favorite method. Captain Wilkinson reported to Secretary Mallory on his thoughts of them.

> With regard to the class and description of vessels best calculated for the trade, my preference is decidedly for those furnished with the double screw, for they can be constructed to combine light draft, considerable speed and great carrying capacity (qualities that are common to neither the sidewheel steamer, nor single propellers) and they possess the additional advantages over either, of turning almost upon their keel, a great desideratum in

[26] Admiral Belcher in "Discussion" of the paper by J. Dudgeon and E.J. Reed, p. 213; Hobart, Sketches From My Life, p. 97.

[27] Wilkinson, Narrative of a Blockade Runner, p. 233.

> tracking along our coasts, or crossing our bars at night.[28]

Coquette was 228 feet long, 25 feet in beam, and 12 feet, 2 inches in depth of hold. Her propelling machinery was laid out in a similar way to that of the Dudgeon twin-screw ships. Her engines were not always reliable, breaking down on one occasion just outside Wilmington requiring her to return to Bermuda. She was rigged as a three-masted schooner with a large course on the foremast for running before the wind.[29]

In spite of the small problems encountered with Coquette, the Confederate government bought Matilda, an identical sistership of Coquette, in 1864. She departed Cardiff, on April 4, 1864, bound for Bermuda. Matilda never made it into the Confederacy; on the night of her departure she stranded on Lundy Island in the Bristol Channel and became a total loss.[30]

A Hull, England, shipyard built the iron twin-screw steamer Pelican in 1863. Pelican measured 187 feet, 7 inches long, 24 feet in beam, 12 feet, 8 inches in depth

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[28] John Wilkinson to Stephen Mallory, Wilmington, North Carolina, March 27, 1864, ORN, II, vol. 2, p. 617.

[29] Letter from John T. Bourne to S. Isaac Campbell & Co. in Vandiver, Confederate Blockade Running Through Bermuda, p. 55; letter from Mallory to Bulloch, March 21, 1864, ORN, II, vol. 2, p. 614.

[30] Letters from Bulloch to Mallory, March 17, 1864, and April 14, 1864, ORN, II, vol. 2, pp. 606-608 and pp. 625-627.

of hold, and 445 tons burden. The direct-acting engine cylinders were forty inches in diameter and had a thirty-inch stroke. She made twelve knots on trial, which was considered disappointing. Her "low" trial speed may have been the reason why no other twin-screw ships from Hull appeared as blockade runners. Pelican made one run into Galveston before the war ended.[31]

The Dudgeons also built several larger twin-screw ships as potential blockade runners. Their sixth steamship was Edith and their eleventh was Atalanta, with one twin-screw clipper ship and ships of the Flora class in between.[32] Edith and Atalanta were similar to the Flora class, but longer, with more powerful engines and plain vertical stems. Each had two funnels placed close together amidships rather than the single funnel of earlier Dudgeon vessels. Edith and Atalanta were bought by the Confederate Navy and converted into the cruisers, CSS Chickamauga and CSS Tallahassee. Captain John Wilkinson wrote of Chickamauga,

> She was more substantially built than most of the blockade-runners, and was very swift, . . . She was schooner rigged, with very short masts, and her sails

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[31] William T. Minor to William H. Seward, March 24, and May 1, 1865, Havana Consular Despatches; F. H. Morse to W. H. Seward, February 5, 1864, London Consular Despatches, RG 84, NA; Wise, Lifeline of the Confederacy, p. 315; Wallace E. Martin, comp., Sail and Steam on the Northern California Coast, 1850 -1900 (San Francisco: National Maritime Museum Association, 1983), pp. 44, 45, quoting Humboldt Times, December 19, 1868, and March, 6, 1869; E. W. Wright, ed., Lewis & Dryden's Marine History of the Pacific Northwest (Seattle, Washington: Superior Publishing Company, 1967), pp. 186-187.

[32] "Marine Engines From 1851 to the Present Time," The Artizan (May 1, 1865), p. 106.

> were chiefly serviceable to steady her in a sea-way. Under all sail and off the wind, without steam, she could not make more than three knots in a stiff breeze; by the wind under the same circumstances, she had not even steerage way.[33]

The Dudgeons described the design of Edith thus:

> The Edith was a blockade runner of 531 tons and 200-horse power. On her trial trip she went 13.4 knots, with an indicated horse power = 894 (attained by two pairs of 34-inch cylinders, by 21-inch stroke; steam, 21 lbs.; vacuum 26 1/2 inches; revolutions, 108). The immersed midship section was then 180 square feet, the displacement 510 tons, and the consumption 24 cwt. per hour. This vessel has run the blockade frequently, was then taken possession of by the Confederate Government and transformed into the cruiser Chickamauga. Lately she was said to have been sunk 40 miles above Wilmington to block up the passage in the river.[34]

After Edith, the Dudgeons built the even larger twin-screw Atalanta for more speed. Like her legendary namesake, Atalanta was able to outdistance her pursuers. She was soon outrunning the Union warships on the American blockade. The Confederate Navy Department purchased Atalanta after she proved herself as a commercial blockade runner. The navy converted her into the second-class gunboat

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[33] Wilkinson, Narrative of a Blockade Runner, pp. 209-210.

[34] J.& W. Dudgeon, "Record of Performance and Experiences with Twin-Screw Steamers Built By J.& W. Dudgeon," in Transactions of the Institution of Naval Architects, VI (London: Institution of Naval Architects, 1865), p. 210. See also Bradlee, Blockade Running During the Civil War, pp. 82-84; J. Thomas Scharf, History of the Confederate States Navy, reprint of 1887 ed. (New York: The Fairfax Press, 1978), pp. 808-809, 818; ORN, 1, vol. 10, pp. 44-55, 60, 508-510, 793-794, 802-803 and vol. 12, p. 57; and 2, vol. 1, pp. 725-733, 774 and vol. 2, p. 251.

CSS Tallahassee. As Tallahassee, she made two very successful raids on fishing vessels and small coastal shipping along the New England coast. Her name was changed to CSS Olustee for two more less successful raids under another captain.[35] The presence of Olustee in the river at Wilmington caused state authorities to so fear additional blockading vessels that raiding was discontinued; CSS Olustee was converted back to "peaceful" blockade running to ease the pressure on other blockade runners created by the increased blockade fleet. Her name was changed again; aptly she became Chameleon as a born-again blockade runner. The Dudgeons closely followed news of the career of Atalanta. They said of her in 1867:

> The Atalanta was designed for a blockade runner.[36] She was 546 tons and 200 horse power, a very long vessel, and had very fine lines. On her trial trip she made 15 knots, the engines indicating 1,220-horse power (attained by four cylinders 34-inch diameter by 21-inch stroke; steam 29 lbs.; vacuum 25 1/2 inches; revolutions 120). The midship section was 160 square feet, the displacement 510 tons, and the consumption 26 cwt. per hour. Later there was a race between her and the Queen one of the Dover Railway company's boats, and she beat her adversary by half-an-hour on the short run from Calais to Dover, taking only 77 minutes, while the Queen took 107 minutes. She run(sic) the blockade a great many times, but was taken possession of by the Confederate Government and transformed into the cruiser

[35] Philip L. Welford, "Heave To!-An Account of the Cruises of Commerce Raiders in the American Civil War," Blue Peter (March 1928), pp. 613-619.

[36] The London Illustrated News reported at the time that she was intended for cross-channel service.

> Tallahassee, and did good service as such. She is still in existence."[37]

Rattlesnake, built in 1864, was a repeat of the successful design of Atalanta, completed the year before. She was built on the same model as Atalanta but had a poopdeck and a deckhouse amidships. She had register dimensions of 201.8 feet, by 24.2 feet, by 12.5 feet, builder's measurement tonnage of 615; gross tonnage of 529, and register tonnage of 259. Each of Rattlesnake's engines had paired direct-acting cylinders of 34-inches in diameter with a 21-inch stroke. The screws had a diameter of nine feet and a pitch of 17 feet, 6 inches. Her speed was over seventeen knots on her trial trip. Rattlesnake may have been intended to be converted into another coastal gunboat-raider for the Confederate government, but she ran aground outside Charleston early in 1865 and became a total loss.[38]

Run Her and Mary were advanced twin-screw blockade runners built by the Dudgeon works in 1865. Both ships had identical register dimensions and appear to have been built on the models of Virginia and City of Richmond, two sidewheel runners built in 1864. They were 230 feet long between perpendiculars, 27 feet in breadth, and in 14.6 depth of hold. Run Her and Mary were powered by horizontal,

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[37] J.& W. Dudgeon, "Record of Performance and Experiences with Twin-Screw Steamers Built By J.& W. Dudgeon," in Transactions of the Institution of Naval Architects VI (London: Institution of Naval Architects, 1865), p. 210.

[38] "Naval Engineering - Twin Screws," The Artizan (January 1, 1865), p. 20.

direct-acting, condensing engines. The cylinders were 37 inches in diameter with a 21-inch stroke. Steam was supplied by two double-ended boilers. Each boiler had three furnaces in each end and a funnel for each. Annular superheaters surrounded each boiler uptake to the funnels to heat the steam bound to the engines. The boilers had a combined fire-bar surface of 210 square feet, and a fire-tube evaporating surface of 4290 square feet. The Dudgeons reported that Mary achieved 14.12 knots on her trials.[39]

Run Her was completed first and left for Bermuda early in the year but was lost with a valuable government cargo when she grounded inside Angra Bay, on the island of Terceira in the Azores. Completed in August 1865, the war ended before Mary could leave England to run the blockade.[40]

The Runner/Raiders

Three other pairs of twin-screw ships were built for the Confederate States Navy. Navy Secretary Stephen R. Mallory and Captain James Dunwoody Bulloch recognized the advantages of twin-screw ships for use as blockade runners and "temporary cruisers" following the examples set by the converted Dudgeon blockade runners, CSS Tallahassee and CSS Chickamauga. Mallory sought the advice of

[39] J.& W. Dudgeon, "On Twin Screw Propulsion," in Burgh, A Practical Treatise on Modern Screw-Propulsion, pp. 90-92.

[40] Dudgeon in Burgh, A Practical Treatise, pp. 90-92; description of loss, Dudley to Adams, December 2, 1864, Liverpool Consulular Despatches, RG 84, NA.

Lieutenant John Wilkinson as to the best type of blockade runner; he incorporated the ideas in his orders to Bulloch.[41] In July and August, 1864, Mallory ordered Bulloch to build four twin-screw runners capable of conversion to gunboats or cruisers.[42] Bulloch however, apparently anticipated Mallory's orders: by the time they arrived, Bulloch had already contracted for two twin-screw ships on his own initiative.[43]

The six ships were designed to pay for themselves running the blockade and then be transferred to Confederate naval service for conversion into cruisers. All of these ships were ordered through cooperating private shipping companies for later transferral to the government. Fraser and Trenholm retained title to four ships built by William Denny & Company through P. Henderson & Company, and Crenshaw & Company held title to the two ships built by John and William Dudgeon.[44] The ships were completed too late to serve the Confederate navy directly, although two, Ajax and Louisa Ann Fanny, reached Havana before the war's end.[45]

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[41] Stephen Mallory to James Bulloch, with enclosure from John Wilkinson, March, 29, 1864, ORN, II, vol. 2, pp. 616-617.

[42] Bulloch, Secret Service, pp. 242-243; Stephen Mallory to James D. Bulloch, July 30 and August 19, 1864, ORN, II, vol. 2, pp. 695, 707.

[43] James D. Bulloch to Stephen R. Mallory, ORN, II, vol. 2, p. 686.

[44] Letters from James D. Bulloch to Stephen R. Mallory, September 1, 15, and 16, 1864, ORN, II, vol. 2, pp. 717-718, 721, 725.

[45] William T. Minor to William H. Seward, March 24, 1865, Havana Consular Despatches, RG 84, NA; William S. Hoole, Four Years in the Confederate Navy: The Career of Captain John Low of the C.S.S. Fingal, Alabama, Florida, Tuscaloosa, and Ajax (Athens: University of Georgia Press, 1964), pp. 132-134.

Captain Bulloch planned the vessels well to adapt them for naval work: the engines and boilers were placed below the waterline and cotton "armor" was to be stowed in special compartments surrounding and covering the engineering spaces. Bulloch said that "every device for strengthening the ships and protecting their vital parts was resorted to, that could be adopted without running the risk of exciting suspicion, and with the power and speed allotted to them, and the armament they would have been able to carry, they would have been very formidable ships indeed."[46]

Bulloch ordered the first pair of twin-screw ships on his own initiative as part of a plan to purchase fourteen new blockade runners. He ordered twelve sidewheelers and two twin-screw ships from yards in Liverpool, Glasgow, and London. The two twin-screw ships were Mary Augusta and Louisa Ann Fanny, built in the London shipyard of John and William Dudgeon and engined by their Sun Iron Works. Bulloch had arranged for the sister ships to be owned in part by the Confederacy and in part by the private firm of William Crenshaw & Company. The financial arrangements called for the ships to pay for themselves by carrying cargoes through the blockade. Crenshaw was to retain three-quarter ownership of the vessels until they were paid for and then transfer them to the Confederate government. Following

[46] Bulloch, Secret Service, pp. 242-243.

transfer to full government ownership, the ships could continue as blockade runners or be armed and commissioned in the Confederate States Navy.[47]

Mary Augusta and Louisa Ann Fanny were the largest of the nineteen blockade runners built by J. & W. Dudgeon. Completed early in 1865, they were described as very attractive, clipper-bowed, schooner-rigged steamships. They were of 972 tons, builders old measurement, and 250 feet long between perpendiculars, 28 feet in breadth and 15 feet, 6 inches in depth of hold.[48]

The Dudgeon runner/raiders were powered by two horizontal, direct-acting engines, each with two cylinders 40 inches in diameter, with a 22-1/2-inch stroke. Each engine drove a three-bladed screw 9 feet, 3 inches in diameter, 17 feet, 9 inches in pitch, and 10 feet, 10 inches between centers. Steam was provided by two boilers firing from fore and aft with furnaces possessing 245 feet of grate surface. The powerplant provided an indicated horse-power of 1650. Coal bunkers were placed around the engine and boiler rooms for protection.

John Dudgeon described Mary Augusta and Louisa Ann Fanny as follows

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[47] Colin J. McRae to James A. Seddon, July 4, 1864, OR, IV, vol. 3, pp. 527-528; James D. Bulloch to Stephen R. Mallory, September 15 and 16, 1864, ORN, II, vol. 2, pp. 721, 725.

[48] London Times, January 25, 1865, p. 4. Mary Augusta and Louisa Ann Fanny have been confused by earlier researchers with Enterprise and Augusta, the 250-foot, twin-screw, runner/raiders built by Denny. The vital, overlooked information is the tonnage of 972 mentioned by Bulloch in one of his letters. This tonnage matches the Dudgeon runner/raiders and does not match the tonnage of the ships built by Denny.

> Lately we have built two large blockade runners of 972 tons and 300-horse power. These vessels are no doubt the fastest screw steamers afloat. With an indicated horse power = 1,750 (attained by four cylinders 40-inch diameter by 22 1/2 inch stroke; steam, 32 lbs.; vacuum 25 1/2 inches; revolutions 118) they went 16.2 knots. The immersed midship section was then 208 square feet, the displacement 940 tons, and the consumption 25 1/2 cwt. per hour. Even with one engine only going they realized 12.7 knots. We tried her against the Dover Railway Company's new paddle boat La France, which is said to be very fast, and we beat her on the run between Calais and Dover by 3 1/2 miles. The run from Calais to Dover and back was done in 2 hours 45 minutes.[49]

Mary Augusta and Louisa Ann Fanny were finished too late to run the blockade or join the Confederate navy. Louisa Ann Fanny arrived in Havana in mid-March 1865, but did not run the blockade or serve as a cruiser. A reliable spy informed the Union consul at Havana that Louisa Ann Fanny was supposed to meet a sailing vessel to receive her armament, probably at Andros Island in the Bahamas.[50]

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[49] J.& W. Dudgeon, "Record of Performance and Experiences with Twin-Screw Steamers Built By J.& W. Dudgeon," in Transactions of the Institution of Naval Architects, VI (London: Institution of Naval Architects, 1865), p. 211.

[50] William T. Minor to William H. Seward, March 24, 1865, Havana Consular Despatches, RG 84, NA.

These two runners ultimately did serve in an "American" navy, that of Brazil, under the names Vassimon and Werneck.[51]

In July 1864, Secretary Mallory ordered Bulloch to build "two small steamers, with low-pressure engines" for service in and about the harbor of Wilmington. Their loaded draft should not exceed 7 feet 6 inches and they should have 18 to 24 inches of drag to their hulls. "They should be small, snug, strong, fast, and handy vessels for quick working with light crews." Dimensions and details were left to Bulloch's judgement. To meet this requirement, Bulloch ordered the twin-screws Ajax and Hercules from William Denny and Sons, of Govan on the Clyde. They were designed as large tugboats with a gunboat armament. Ajax and Hercules could serve a valuable double duty on the approaches to Wilmington, acting as gunboats as needed and rescuing grounded blockade runners to prevent their destruction.[52]

Bulloch reported to Mallory how the destination of the Wilmington steamers was concealed from Union spies and the British government. "They have been designed as tow boats, to deceive the Federal spies, but will require insignificant alterations to convert them into serviceable gunboats for local work. It will only be

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[51] Mario F. Mendonca and Alberto Vasconcelos, Repositorio de Nomes dos Navios da Esquadra Brasileira, (Rio de Janiero: Servico de Documentacao-Jeral da Marinha, 1959), pp. 263, 270.

[52] Stephen R. Mallory to James D. Bulloch, July 30, 1864, ORN, II, vol. 2, p. 695.

necessary to fill up the space between the beams, and add a few stanchions under the permanent position of the guns."[53]

Ajax's and Hercules' hull design was similar to the single-screw cruiser CSS Georgia, also built by Denny. A company engineer estimated that their speed would be 13 1/10 knots on a draft of 7 feet. The contract specifications of Ajax and Hercules called for them to be 170-feet long in keel and forerake, 25-feet in breadth of beam, and 12 1/2 feet moulded depth.[54]

Each screw of Ajax and Hercules was driven independently by a horizontal, direct-acting engine with paired 28-inch cylinders. The propellers were of cast iron, 6 feet, 10 inches in diameter with a 12-foot pitch. The condensers were built "larger then usual as the vessels are for a warm climate." The exhaust steam line was fitted to blow off five feet under the waterline "as usual." The injection piping for boiler water was designed with two intakes; one in the usual place on the hull bottom, and the other intake on the "five feet line" to avoid sucking in mud when in shallow water. The boilers were cylindrical, tubular boilers that produced a working pressure of 30 PSI. For higher performance, separate steam chests were fitted to superheat

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[53] Extract from report of James D. Bulloch to S.R. Mallory, quoted in Bulloch, Secret Service, vol. 2, pp. 241-244; Lyon, The Denny List, 1, Nos. 108-109.

[54] "Nos. 111 and 112, Specification of two Iron, Twin-screw Tug Steamers for Messrs. Patk. Henderson & Co. Glasgow," Denny Collection, University of Glasgow Archives, Glasgow, Scotland; Lyon, The Denny List, Nos. 108-109.

steam bound from the boilers to the engines. The boilers were covered with a layer of felt under another layer of sheet lead.[55]

The other four ships were two pairs of 250 foot long twin-screw ships. Secretary Mallory ordered Bullock to build "the two vessels referred to in such a manner as to arm and use them for dashes at the enemy's commerce and for blockade running at pleasure. For this purpose their construction must differ from that usually adopted in vessels exclusively for this or any other trade." Mallory left the details to Bulloch but included a list of desirable qualities.

> First. The first and greatest requisite is speed at sea.
>
> Second. Draft of water should not exceed, deep loaded, ten (10) feet.
>
> Third. Strength to stand heavy sea and weather. She will be used to bring iron plates from Nassau and Bermuda.
>
> Fourth. Carrying capacity for 200 to 250 tons, or as much as may be found consistent with speed, strength, and power.
>
> Fifth. Deck frames forward, aft, and amidships extra strong to bear three guns, say 30-pounder Whitworth's.

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[55] "Ajax" Nassau Customhouse records, Eldredge Collection, The Mariners' Museum Archives, Newport News, Virginia; manuscript memorandum from Denny & Co. to William Denny & Brothers Enterprise and Adventure ship envelope, Denny Collection, University of Glasgow Archives, Glasgow, Scotland; Lyon, Denny List, nos. 108-9, and 111-2.

> Sixth. Power to be applied to one screw, is speed can be had; if not, then two; and if they can be so arranged as to be readily disconnected when under sail it would be advisable.
>
> Every necessary arrangement should be made to prevent the display of smoke.
>
> Coal bunkers, if practicable, should protect the boilers.
>
> Boilers should be so constructed as to be readily kept clear of scale. The speed of the Coquette was reduced by the deposit of scale and her sale was a necessary consequence.
>
> A berth deck and a room suitable for magazine should be fitted up. If this might beget suspicion, the space for it might be decided upon, and the partitions for it prepared and put on board to be fitted subsequently.[56]

The two large ships which Mallory ordered built were also produced by William Denny & Sons. Adventure and Enterprise were larger versions of Ajax and Hercules. Described in their contract as "Twin Screw Tug Steamers," both ships were designed with heavy deck beams and fittings designed to allow easy conversion into gunboats. These ships were to be bigger and better versions of Tallahassee and Chickamauga, able to cruise longer off Northern coasts. Mallory referred to the success of the first cruise of the twin-screw Tallahassee and generalized about runner-raiders: "of course

[56] Stephen R. Mallory to James D. Bulloch, August 19, 1864, ORN, II, vol. 2, p. 707.

these vessels are not self-sustaining and have to seek a coal depot at short intervals, but as we can not get the vessels we want we must get the best we can."[57]

Adventure, Denny's hull no. 108, and Enterprise (II), hull no. 109, were finished early in 1865. The building contract required

> A Twin Screw Steamer - 250 X 30 X 16 depth moulded - Flush deck except low topgallant forecastle if required. One house amidships - Cabins aft for 10 first class passengers & officers. Forward for crew & firemen. Coal bunkers for 300 tons fuel. Remainder of ship 2 large cargo holds. 2 steam winches with heavy "I" beam deckbeams and a gangway deck of 2 feet each side . . . . To carry 550 tons coal and cargo on 12 feet including keel. Speed on Trial easy 14 1/2 knots at 11 1/2 feet aft.[58]

The engines were horizontal, direct-acting types, each with a pair of cylinders 42 inches in diameter. The contract described them as "two pair horizontal condensing engines of 300 horsepower nominal." All parts were to be of the best material and carefully fitted. The machinery design was adapted to work along the hot, muddy southern coastline. The condensers were built larger than usual due to the heat, and the injection pipes drew water from either the usual bottom intake or "owing to the mud" from a point on the ships' side. A full set of deck awnings were

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[57] Stephen R. Mallory to James D. Bulloch, August 19, 1864, ORN, II, vol. 2, p. 707.

[58] Manuscript memorandum from Denny & Co. to William Denny & Brothers Enterprise and Adventure ship envelope, Denny Collection, University of Glasgow Archives, Glasgow, Scotland; Lyon, Denny List, nos. 108-9, 111-2.

also fitted to protect the crew from the hot tropical sun. For quieter operation, the ordinary exhaust steam line to the funnel, could be diverted to blow off underwater.[59]

The six "temporary cruisers" built in Scotland and England never had the chance to prove their value as armed merchant cruisers. The ideas of Bulloch and Mallory, embodied in the six runner-raiders begun in 1864, was not finally proven until the First World War. Both German and British merchant vessels, built to be converted into "temporary cruisers," performed valuable service.

The value of screw propellers had been proven prior to the American Civil War. The value of twin-screw ships, however, was demonstrated by the ships built for blockade running during the conflict. Blockade runners introduced the new propulsion scheme into widespread use. The success of twin-screw ships encouraged their widespread adoption in the merchant and war fleets of the world. The Dudgeon design with a screw turning on each side of the single rudder post, became the most common form of multiple screw vessel. Twin-screw vessels proved capable of attaining high speed. They competed favorably with all but the very fastest sidewheelers. Screw-propelled blockade runners expanded the limits of technology, demonstrated its capabilities, and paved the way for a new generation of fast steamships.

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[59] Manuscript copy of "Specification of 2 Iron Twin Screw Tug Steamers For Messrs. Patrick Henderson & Co. Glasgow," in Denny Papers Collection, Glasgow University Archives, Glasgow, Scotland, pp. 10-11.

Chapter VII: THE END OF BLOCKADE RUNNING AND ITS EFFECTS

Union land forces finally stopped blockade running by capturing the remaining Confederate ports. The naval blockade itself made trade difficult but never stopped it. Blockade runners entered and left Confederate ports until the last one was taken. The port of Mobile, Alabama was closed to blockade runners on August 5, 1864, when Admiral Farragut forced a powerful fleet past Forts Morgan and Gaines at the mouth of the bay and worked with land forces to take the bay and city.[1] Wilmington, North Carolina, fell when a combined forces attack took Fort Fisher on January 15, 1865.[2] The port of Charleston, South Carolina, was closed to blockade runners on February 17, 1865, when the city was abandoned by the Confederates on the approach of Sherman's army from the rear. By March only the Gulf ports remained uninvested and they surrendered along with the remainder of Texas. Sabine Pass returned to Union control on May 25. The harbor of Galveston, Texas, was the last major Confederate blockade running port to return to the Union, when it fell on June 5, 1865.[3]

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[1] H. W. Wilson, Ironclads In Action, A Sketch of Naval Warfare From 1855 to 1895, 2 vols. (London: Sampson Low, Marston and Company, 1896), vol. 1, pp. 114-134.

[2] Wilson, Ironclads In Action, pp. 135-142.

[3] Mahan, Gulf and Inland Waters, p. 249.

Some blockade runners attempted to reach southern ports through invasion fleets assembled at their entrances. Several runners were trapped inside fallen ports and a few were captured after running into ports already captured. The experience of Chameleon, the former CSS Tallahassee, is representative of the last days of the trade.

Chameleon's last blockade running voyage began on January 19, 1865. She left from Bermuda with a load of provisions for the armies in Virginia. Her captain, John Wilkinson CSN, was an experienced blockade runner who had helped set up government controls of the trade. When Chameleon arrived within the Wilmington bar after passing the blockade fleet, she signalled the shore, only to discover that the fort had been captured by Union forces. Wilkinson immediately turned her about and steamed back out through the blockade fleet and returned to Nassau. Chameleon reached port very short of coal. Wilkinson immediately coaled ship and headed for Charleston loaded with a cargo of foodstuffs desperately needed in the Confederacy. There he found that the Charleston blockading fleet had been augmented by vessels formerly guarding Wilmington. Once again, Chameleon was prevented from landing her cargo and forced to return to Nassau.[4]

One blockade runner, the sidewheeler Syren, did run through the fleet into Charleston harbor, only to discover that the city was being abandoned by Confederate forces. Syren ran back out through the Union fleet to Nassau. She was followed by

[4] Wilkinson, Narrative of a Blockade-Runner, pp. 231-243.

the Dudgeon-built twin-screw ship G.T. Watson, which arrived first and brought the news of the fall of Charleston to Nassau.[5] The new sidewheeler Deer was not so lucky. She was deceived by Union forces, which set the Confederate Signal Service navigation range lights and procedures after they occupied the city; Deer failed to notice the change and was captured.[6]

The captures of Wilmington and Charleston put a large fleet of blockade runners out of business overnight. One British blockade runner described the end: "Wilmington and Charleston being now closed, Nassau's days as a blockade-running centre were over, and the only thing to do was to wind up our affairs as well as we could, and prepare to go home."[7] Ships under the Confederate flag, such as Chameleon, would soon be without a country. Some runners at Nassau headed for the Gulf of Mexico for a last desperate attempt to run the blockade there. Others, drawing too much water to be useful in the Gulf, steamed for Great Britain. Chameleon landed her cargo of provisions at Nassau and sailed for Bermuda on March 22, arriving on the twenty-sixth. She coaled and sailed the same day for Liverpool.[8]

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[5] Wilson, Ironclads In Action, p. 194; Wise, Lifeline of the Confederacy, p. 210.

[6] Wise, Lifeline of the Confederacy, p. 211.

[7] Taylor, Running the Blockade, p. 163.

[8] Wilkinson, Narrative of a Blockade-Runner, pp. 227-231.

The last blockade runner to reach Nassau with a cargo of cotton from the Confederate States was Imogene. She left Galveston on May 3, took on stores and ice at Matanzas, Cuba, and arrived at Nassau on May 10. Imogene discharged her deck cargo and sailed the next day for Liverpool, via Bermuda and the Azores. She reached Liverpool June 10th and discharged her crew on the 14th, "all being sorry at losing a good job."[9]

Postwar Employment of Blockade Runners - Naval, Mercantile, and Illicit Activities

What happened to the highly specialized fleet of blockade runners when the war ended? One blockade runner described the end of the trade in the Gulf of Mexico.

> . . . came the news of Johnston's surrender, and the total collapse of the Confederacy; and of course blockade running, which was now being carried on upon an extensive scale between Havana and Galveston, was all at once brought to termination; and the large number of swift steamers recently brought to Havana to run the blockade were left without occupation, many of them never getting the chance to make a trip; others expressly built at great expense, newly finished and fitted out, arrived at the scene after all was over.
>
> The exciting trade was now over, and those who had been engaged in it had to betake themselves to other occupations. As for the large fleet of blockade-running

[9] Manuscript letter CA-32, A. J. Forrest to "My dear Son," June 13, 1865, The Mariners' Museum Archives, Newport News, Virginia.

> steamers thrown idle at Havana, it would be difficult to say what became of them all; some returned to the ports they came from, others were sold and fitted out for various trades, and some lay long without being utilized for anything; and I apprehend that there must have been considerable loss occasioned by this sudden break-up, which would somewhat counterbalance the profits that had been previously earned.[10]

After the war, former Confederate steamers were confiscated if they were known to have been government property. A Federal District Court ruled that the United States was the successor to all assets of the Confederacy in the case "U.S. versus 44 Bales of Cotton, in Rem." In spite of the strenuous efforts of Union diplomats, several Confederate government steamers were so well protected by secrecy that they remained with the companies that "managed" them. The Collie and Crenshaw steamers, in which the Confederate government had owned an interest, remained in private hands. The runner fleet of Fraser, Trenholm, and Company, the legal owners of many Confederate vessels, also could not be proved to be connected to the Confederacy. Most privately owned steamers escaped confiscation unless in a Confederate port at its capitulation.[11]

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[10] Watson, Adventures of a Blockade Runner, p. 322.

[11] Collie and Crenshaw had been partners in supplying ships and cargoes to the Confederacy. The Confederate government owned a three-quarter interest of the ships concerned. Later the partnership between Alexander Collie and Crenshaw and Company dissolved and both companies separately extended contracts for more steamers with the government. Goff, Confederate Supply, pp. 120-123, 139, 176; Wise, Lifeline of the Confederacy, pp. 222-224.

One unusual case was the shallow draft sidewheeler Wren, which had run to Galveston several times before the port was closed. Her crew mutinied in route from Havana to Nassau and turned the ship in at Key West, applying for prize money. Protracted legal manoeuvering saw the ship initially condemned as a legal prize. The ruling was overturned by the Supreme Court on appeal, and the ship, already sold, was ordered restored to her British owner, John Laird the Younger. Unable to restore the ship, the court paid Laird the money realized by Wren's sale, minus court costs of $ 5,666.88.[12]

The legal maneuvering concerning Chameleon were even more complex. She was seized by the British government as a known Confederate government steamer. Chameleon was re-registered under her original name Atalanta and sold at auction. Her new owners renamed her Amelia.[13] The United States Consul sued for possession and the ship was turned over to the United States government as successor to the Confederate government and property.[14] The United States government then

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[12] "Libel of Steamer Wren and Cargo" and"Testimony of Master Edward C. Stiles, James C. Long, Thomas R. McGahan, Charles W. Gilley, John Howard, and other witnesses," June 16, 1865, Admiralty Court Records, vol. 7, December 1862-June 1867, U.S. District Court, Southern District, Florida (Key West), East Point Georgia, Federal Records Depository, vol. 9, pp. 1-11.

[13] "The Late Confederate War-Steamer Tallahassee," The Illustrated London News, vol. 46 (1865), p. 411; "The Chameleon, Otherwise Tallahassee," London Times, April 25, 1866, p. 13; Patricia E. O'Driscoll, "Ship With Seven Names," Sea Breezes, 110, vol. 19 of New Series (February 1955), p. 134.

[14] "Admiralty Court, April 24 (before the Right Honorable Dr. Lushington), The Chameleon, Otherwise Tallahassee," London Times, April 25, 1866, p. 13.

auctioned her off at Liverpool.[15] In September, 1866, Prioleau, the Liverpool agent for Fraser, Trenholm and Company the ostensible owners, sued to have Tallahassee returned to the company but lost the case. The sale was allowed.[16]

The highly specialized steamships built to run the blockade found few uses in legitimate trade following the war. They were not well suited for traditional cargo trades because their great speed, with its associated high fuel requirements and low cargo capacity, was a handicap. Some were modified for legitimate trade, some continued in illicit trades, and many were bought by various navies.

Illicit Trade and Mercenary Adventures

Various types of illicit trade were open to former blockade running vessels. Blockade running methods and technology were useful and widely copied in later conflicts. The best available vessels for shady, illegal or contested trades remained the large group of ships built for trade with the Confederacy. They had the speed and shallow draft requisite for many such trades. Former blockade runners were used for opium smuggling on the China coast, and for gunrunning into Crete, Cuba, and Spain as described below.

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[15] "Sale of Confederate Cruisers," London Times, June 15, 1866, p. 12.

[16] "Seizure of Alleged Confederate Ships," London Times, September 6, 1866, p. 10.

Three blockade runner model steamers were sold for another illicit trade even before blockade running had ended. Foam, Scud, and Petrel, built by Samuda in London, were sold to carry opium on the China coast. They were "bought for the China trade," the real China trade, in September 1864.[17]

Former Blockade Runners in the United States Navy

During the conflict the United States Navy purchased and commissioned forty-seven former blockade running steamers, including fourteen built for the trade.[18] They were used primarily as blockaders, although a few became supply ships and flagships. The U.S. Navy had problems keeping the former blockade runners in repair. The navy had gone through tremendous growth in the buildup to prosecute the blockade; financial resources for yard work and talent for repairs were stretched thin. The engineering philosophy of the navy was to build solid, dependable, low-maintenance powerplants for their vessels; the design philosophy of blockade runner builders was directly at odds with this, stressing performance at all costs.[19] After

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[17] Foam, Petrel and Scud were 230 feet long and 26 feet broad. Their 240 nominal horsepower engines were capable of driving them at fourteen and one half knots, "Trial Trip of the 'Foam,'" The Artizan, October 1, 1864.

[18] Haberlein, Former Blockade Runners in the USN, pp. 29-31.

[19] Taylor, Running the Blockade, p. 85; Harold and Margaret Sprout, The Rise of American Naval Power, 1776-1918 (Princeton, New Jersey: Princeton University Press, 1939), pp. 153; Edward William Sloan, III, Benjamin Franklin Isherwood, Naval Engineer: The Years as Engineer in Chief, 1861-1869 (Annapolis, Maryland: United States Naval Institute, 1965), pp. 33-34, 101; Bennett, Steam Navy, pp. 503-504.

the war ended, former runners, like most purchased civilian vessels, were disposed of quickly; most were let go.[20]

Few ships and fewer fast steam ships were needed by the postwar navy. Parsimonious postwar administrations cut back funds for both ships and operating expenses, discouraging the navy from keeping steam-powered vessels with sailing rigs too small to allow economical cruising under sail. Nine former runners served beyond 1865, although only three vessels were kept for any length of time after the war, all listed as despatch vessels and serving as flagships.[21] Three vessels lasted beyond 1870; A.D. Vance, renamed USS Frolic, Margaret and Jessie, renamed USS Gettysburg, and Emma Henry, renamed USS Wasp. All three were heavily built, fast, and furnished luxuriously, suiting them for service as squadron flagships.[22] Frolic continued to serve until October 1877; Gettysburg continued in the Navy until May 1879, working mainly with the Hydrographic Office; and Wasp protected United States interests in South America during the War of the Triple Alliance against Paraguay and continued in the navy until 1876.[23]

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[20] Bennett, Steam Navy, pp. 624-625; Haberlein, Runners in the USN, passim.

[21] Samuel P. Boyer, Naval Surgeon: Blockading the South, 1862-1866; The Diary of Dr. Samuel Pellman Boyer, Elinor Barnes and James A. Barnes, eds. (Bloomington: Indiana University Press, 1963), p. 367; Haberlein, Former Runners in the USN, pp. 130-135.

[22] Bennett, Steam Navy of the United States, pp. 624-627.

[23] DANFS, II, p. 451; III, pp. 92-93; VIII, p. 141; Seaton Schroeder, Half Century of Naval Service (New York: D. Appleton and Company, 1922), pp. 106-132;

The Ottoman Turkish Navy and Cretan Blockade Running

The navy of Ottoman Turkey also utilized former blockade runners heavily. A long lasting dispute with Greece over the control of the Island of Crete, led in 1867, to a quasi-undeclared blockade by the Turkish Navy of the Island. Greek supporters of the insurrection bought about a half-dozen out-of-work former blockade runners and ran arms, supplies, and soldiers past the Turkish war fleet. The ships carried arms and ammunition from Great Britain to Crete on their initial trip and thereafter carried food and supplies mainly from the Greek ports of Syra and Poros.[24] The Greek government purchased at least two ex-blockade runners, Boubalina, ex-Colonel Lamb, and Amphitrite, ex-Penguin. Boubalina exploded at Liverpool under suspicious circumstances while loading munitions reported to be for the Cretan revolutionaries. Other Greek blockade runners were stopped by different means.[25]

The Ottoman navy established an inefficient blockade of Crete which was violated with impunity by the Greek blockade runners. The Turks realized the need

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Haberlein, Former Runners in the USN, pp. 131-135; Paul H. Silverstone, Warships of the Civil War Navies (Annapolis, Maryland: Naval Institute Press, 1989), pp. 68-69, 72, 73.

[24] William Miller, The Ottoman Empire and Its Successors, 1801-1927 (London: Frank Cass and Company, 1968 reprint of 1927 3rd ed.), pp. 307-318.

[25] The Engineer, June 10, 1864, p. 364; Eric Heyl, Early American Steamers, vol. 4 (Buffalo, New York: n.p., 1965); Ian A. Grant, "Answer no. 28," The Mariner's Mirror, 69, no. 2 (May 1983), p. 195; Baker and Tre Tryckare, The Engine Powered Vessel, p. 65; builders' (full hull) model, 1:48 scale, in collections of Merseyside Maritime Museum, Liverpool.

for speedy ships to stop this practice and bought and armed the former blockade runner Izzedin. They also bought three ships built to run the blockade by Thomas Wingate and Company of Whiteinch, Glasgow, but finished too late to run the American blockade. They were Bella, renamed Henia or Chania, Mary Helen, renamed Candia or Kandia, and Whiteinch, renamed El-Deiz-y-Sai-de-April. Captured vessels later augmented this force.[26]

In 1867 a sharp running fight, reminiscent of several actions during the American Civil War, occurred between Izzedin and the armed Greek blockade runner Arkadion. Arkadion's paddlewheel was disabled, leading to her capture. The Greek Arkadion became the Turkish navy Arkadi.[27]

In spite of the capture of Arkadion, and the use of Izzedin, the Turkish navy initially proved unable to stop the Greek supply of the insurrection. What finally stopped blockade running into Crete was the employment in 1869 of the former blockade running Captain Hobart-Hampden to head the Turkish fleet. He called the process "set a thief to catch a thief." He bought and armed the large, fast ex-

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[26] "Thomas Wingate & Coy," Clyde Built Ships, University of Glasgow Archives, Glasgow, Scotland.

[27] "Arcadion et Izzedin (19 aout 1867), Etude sur les combats livres sur mer de 1860-1880." Revue Maritime Et Coloniale (March-September 1881), pp. 517-519; Miller, The Ottoman Empire, pp. 317-318.

American Civil War blockade runners Rosine and Ruby and put an efficient blockade in place, suited to the peculiarities of the situation.[28]

Several former blockade runners in use as gunrunners were using the Greek harbor of Syra as an entrepot. One, Enossis, fired on the Turkish flagship in escaping pursuit and thus could be treated as a pirate. Hobart Pasha put in place a de facto blockade of the Greek port using the excuse that he was seeking to capture the "pirate." This blockade of an ostensibly neutral port stopped the runners from operating and led to a trial of Enossis. Although the ships were not taken, their failure to arrive in Crete with provisions helped to bring the Cretan Insurrection to an end.[29]

Several of these former blockade runners in the Ottoman navy also saw service in another war. During the Russo-Turkish War of 1877-1878, the large paddle steamer Rethymo, with Hobart Pasha in command, ran a Russian gauntlet down the Danube River to join the Turkish fleet in the Black Sea.[30]

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[28] Hobart, Sketches From My Life, p. 190; E.B.D. "Le Vice-Amiral Hobart-Pacha, Commandant L'Escadre Ottomane De La Mediterranee," L'Ilustration (February 6, 1869); "L'Incident Hobart Pacha (1877)," Durassier, L'Anne Maritime 1877, (Paris: n.p., 1878). The latter was graciously provided by Dr. Christian St. Hubert, Brazilia, Brazil.

[29] Hobart, Sketches From My Life, pp. 191-197.

[30] Hobart, Sketches From My Life, pp. 204-208; "La Marine Ottomane dans la Guerre de 1877-78," Revue Maritime et Coloniale, 1877; J.W. King, "The Turkish Navy," in Report of Chief Engineer J.W. King, United States Navy, on European Ships Of War and Their Armament, p. 263; Conway's, p. 393.

The Brazilian Navy and the War of the Triple Alliance

In 1864 a war began between Paraguay, led by Francisco S. Lopez, and the Triple Alliance composed of Brazil, Uruguay, and Argentina. The war largely took place near and on the Uruguay, Parana, and Paraguay Rivers. Lopez had built a strong army and an adequate river navy. On the rivers he was opposed by a predominantly Brazilian fleet, which maintained a blockade to prevent supplies from traveling upriver, and supported combined operations. Brazil bought a number of warships in Great Britain and several ex-blockade runners to serve as armed transports. Argentina also bought several former blockade runners for use as transports. None distinguished themselves in service. The war ended with the death of Lopez in 1870.[31]

A Liverpool shipowner and part owner of the steamers Emily and Caroline reported in September 1866 that: "Todays [sic] news from Brazil is very favorable for selling or employing the boats there." He also proposed working with the prominent shipping houses, Brambly Moore and Lamport and Holt, which traded to South America, to assist in selling the ships.[32]

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[31] Wilson, Ironclads In Action, vol. I, pp. 252-264; Robert L. Scheina, Latin America: A Naval History, 1810-1987 (Annapolis, Maryland: Naval Institute Press, 1987), pp. 19-27. Several conversations with Dr. Scheina helped to clarify difficult points concerning South American navies and conflicts.

[32] Letter from J. N. Beach to Begbie, Liverpool, September 17, 1866, in Denny Collection, University of Glasgow, Glasgow, Scotland.

Among the ex-blockade runners bought by Brazil were the four large twin-screw runner/raiders built for the Confederate navy. Louisa Ann Fanny became Vassimon and Mary Augusta became Werneck. They also bought and armed the Denny twin screw Enterprise and renamed her Brasil. Adventure, her sister ship, was bought by the Argentinean Navy, armed and named Amazonas.[33]

The large sidewheel blockade runners Abigail and Ray, completed too late to serve the Confederacy, served as Brazilian naval transports. They were renamed Isabel and Leopoldina. William C. Miller and Sons, had built the hulls, and Fawcett, Preston & Co., the engines of the three sister blockade runners in 1865. The ships were 262 feet long overall, 252 feet long in keel and forerake, 30 feet in breadth, and 12 feet, 6 inches in depth of hold. Their tonnage was 1110 tons burden and their engines were of 300 nominal horsepower. Lelia, the first sister finished, had foundered on Liverpool bar early in 1865. [34]

The ownership of vessels bought for national service during the War of the Triple Alliance appears to have been kept secret. The method used to cloak national ownership under commercial vessel papers was probably similar to that used by the Confederacy during the American Civil War. If acknowledged as warships or naval

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[33] Lyon, The Denny List, nos. 108-109.

[34] The Artizan, November 1, 1864, p. 261; "The Steamer 'Lelia,'" The Artizan, February 1, 1865, p. 45; "The Double Disaster at the Mouth of the Mersey," The Illustrated London News, Supplement, January 28, 1865; "Boilers and Oscillating Paddle Wheel Engines, 300 HP Collectively, Fitted in the I.S.S. 'Abigail'. Constructed By Messrs. James Watt & Co.," in Bourne, Modern Marine Engineering, plate 30.

transports they might have suffered detention and restrictions in neutral ports, but cloaked by false merchant vessel status, they remained unencumbered. Brazilian and Argentinean naval vessels were able to use the same loopholes in the British Foreign Enlistment Act as had the Confederates.

The Peruvian and Chilean Navies in the War Against Spain, 1865-66

The nations on the Pacific coast of South America went to war with Spain at the end of 1865. Peru and Chile were the primary participants, though Bolivia and Ecuador also signed the alliance that was named the American Union. Early in the struggle several former Confederate officers were employed to help the "Union" fight the modern navy of Spain.[35]

The navies of both Peru and Chile bought former blockade runners for use as armed transports and gunboats. Chile bought the former runner Thistle in 1865, converted her to military use by fitting a single gun and renamed her Ancud, after a recent naval battle there which was claimed as a victory by the Union. Ancud continued in Chilean naval service until 1878, when she was sold to a merchant owner who kept her in service until lost in 1889.[36] The next year Chile bought the

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[35] David P. Werlich, Admiral of the Amazon, John Randolph Tucker, His Confederate Colleagues, and Peru (Charlottesville: University Press of Virginia, 1990), pp. 78-133; Wilson, Ironclads In Action, pp. 252-257.

[36] The information on Thistle and Giraffe in Chilean service was provided by Dr. Christian St. Hubert, Brazilia, Brazil, in a letter dated June 13, 1990. Sources he consulted include Rodrigo Fuenzalida Bade, La Armada de Chile, 1813-1968, 4 vols.

famous Robert E. Lee, armed her and renamed her Concepcion. She stayed in service only shortly after
the war ended before being sold due to her poor condition.[37]

The Spanish Navy

From the 1870s to the early 1880s, Spain maintained a sizeable navy which included former blockade runners. At least two, Victoria de las Tunas, ex-Lilian, and Churruca, ex-Hope, saw service against other former blockade runners carrying arms and adventurers to assist in the Cuban Insurrection. Lilian and Hope were bought by the Spanish navy and converted into a paddle corvette and a paddle frigate, respectively. Churruca served in the navy until 1880; Victoria de las Tunas was wrecked off Mariel on the northern coast of Cuba in 1870 while engaged in suppressing the Cuban Insurrection or Ten Year's War. Churruca also served in the

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(Valpariso: Talleres Empresa Periodispica, 1978) 2nd ed., vol. 2, pp. 601-602, 641; vol. 3, p. 703; DANFS, vol. 2, pp. 94-95; William M. Lytle and Forrest R. Holdcamper, comps., Merchant Steam Vessels of the United States 1790-1868 (New York: Steamship Historical Society of America, 1975), p. 34; the yard list of J. & G. Thomson, probably that in the collection of the University of Glasgow Archives; also see Silverstone, Warships, p. 88.

[37] Fuenzalida Bade, La Armada de Chile, vol. 2, pp. 601-602, 641; Wise, Lifeline, p. 318; Silverstone, Warships, p. 72.

Spanish navy during the Second Carlist War, although what part she played is unclear.[38]

Cuban Gunrunning During the Ten Years War, 1868-1878

At least two former blockade running vessels participated in the First Cuban Insurrection, or Ten Years War, of 1868-1878. These "filibusteros" carried guns, supplies and revolutionaries past the Spanish fleet off the coasts of Cuba. Ironically, the gunrunners operated from United States ports. One of the best known was Hornet. The sidewheel runner Lady Sterling had been captured during the Civil War by the U.S. Navy and renamed Hornet. After the conflict ended she was sold to a commercial firm and became a famous gunrunner. The Spanish Navy "blockaded" Hornet at Port-au-Prince, Haiti, for nine months although she was not captured. The Spanish navy gunboat Churruca, ex- runner Hope, participated in that blockade.[39]

The shallow draft sidewheeler Virgin was also captured by the U.S. Navy during the Civil War. She served briefly in the U.S. Revenue Cutter Service but was too wasteful of coal and was sold to the Cuban revolutionary junta under cover of

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[38] Christian St. Hubert, "The Early Spanish Steam Navy," Warship International, vol. 20, no. 1, 1983, pp. 43-45; Silverstone, Warships, pp. 74, 222-223.

[39] Silverstone, Warships, pp. 73-74; Scheina, Latin America: A Naval History, p. 312.

U.S. private parties. The junta had her overhauled and repaired and renamed her Virginius.[40] In June 1871 she ran a cargo of arms and foodstuffs to Venezuela and assisted Guzman Blanco in a revolution in progress. Blanco then helped the Cubans in turn and added men to an expedition that ran the Spanish "blockade" of the Cuban coast, gaining fame as had Hornet. Virginius made at least one more successful run with insurgents into Cuba.[41] She was captured on October 23, /1873, making for Cuba with about one hundred filibusters aboard, by the Spanish screw corvette Tornado, the former Confederate cruiser Pampero. Virginius's captain, former Confederate Navy Lieutenant Joseph Fry and fifty-two of those on board Virginius were executed by Spanish authorities in Cuba. The executions caused an international incident between the United States and Spain, but effectively stopped gunrunning into Cuba.[42]

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[40] Virgin, b) Virginius was an iron sidewheeler built by Aitken & Mansel. Virginius was taken to Spain where she survived until the Spanish Civil War when she was bombed by Republican aircraft. Only one ex-runner survived her, Chicora on the Great Lakes. S.R. Franklin, Memories of A Rear-Admiral (New York: Harper & Brothers Publishers, 1898), pp. 230-232; J. Llabres, "The First Cuban War - The Gunboats of 1870," Revista Genera De Marina, translation by D. Gibbard, appearing in Naval Notes, 9 and 10.

[41] Sprunt, Derelicts, pp. 241-44; Schroeder, Half Century of Naval Service, pp. 67-68.

[42] Sprunt, Derelicts, pp. 243-246; Wilkinson, Narrative of a Blockade Runner, p. 99; Henry B. Russell, An Illustrated History of Our War With Spain, Its Causes, Incidents, and Results Embracing a Complete Record of Military and Naval Operations (Hartford, Connecticut: A.D. Worthington & Co., Publishers, 1898), pp.138-177; John R. Spears, The History of Our Navy From Its Origin to the End of the War With Spain, 1775-1898, vol. 1 (New York: Charles Scribner's Sons, 1899), pp. 38-48; Schroeder, Half Century of Naval Service, pp. 66-72; Foster Rhea Dulles, Prelude to World Power, American

The Second Carlist War, 1872-1876

Meanwhile, in Spain, the tensions that had helped to precipitate the Cuban Insurrection and a war with the former Spanish colonies in the Pacific led to a revolt that overthrew Queen Isabella in 1866. She fled to France and a bloody war of succession followed. The supporters of the old government retained the navy and set up a blockade of the ports held by King Carl. His supporters turned to blockade running for supplies in a system that very much resembled American Civil War arrangements. The Spanish navy blockaded the coast trying to stop gunrunners from Northern Europe from reaching besieged Bilbao. Their spies and consuls reported loadings, departures and suspicious vessels to aid the blockading fleet. The methods, equipment and tactics of American Civil War blockade running probably served as the models for both sides in the Second Carlist War. No former Confederate blockade runners are known to have run the Spanish blockade. The former Confederate blockade runner Don was sold to Spanish owners in 1876, and later registered in Bilbao.[43] Churruca, the former Hope, served in the Spanish Navy until 1880, though there is no evidence that she served on that blockade.[44]

Diplomatic History, 1860-1900 (New York: Collier Books, 1965), pp. 162-164.

[43] "Don" entry in Edwin Eldredge Steamship Notebooks in Eldredge Collection, Mariners' Museum Library, Newport News, Virginia.

[44] Rafael Gonzalez Echegaray, "De las Guerras Carlistas, El Bloqueo Naval," Revista Genera De Marina (June 1978), pp. 643-656; J. Fernandez Gaytan, "Tercera Guerra Carlista (1872-1876)," Revista de Historia Naval (1989); "La Marina en Las Guerras Carlistas," Revista Genera de Marina, (April 1959); Russell, History of Our War With

Legitimate Merchant Trade

Most former blockade runners entered legitimate trades after the war ended. Some returned to peaceful routes they had pursued prior to the war, and others expanded trade in new geographical areas. Large groups of former blockade runners expanded steam trade in the St. Lawrence area of Canada, the North Sea, Japan, Australia, the Caribbean, and the South American coast.

Blockade runners that did find employment in legitimate trade had to be modified to civilian configurations. Passenger accommodation had to be enlarged and improved and cargo capacity increased where possible. Most of former runners suffered from limited cargo stowage and required expansion to compete with other vessels. Most runners transferring to legitimate trades were given an additional deck atop the original weather decks and expanded superstructures. Several steamers were lengthened as well.[45] Badger was lengthened in 1869 and renamed Shanghai. Lark was lengthened sixty feet and renamed Port Said. She was later cut in two; each end was completed to make two complete screw steamers.[46]

Spain, pp. 138-139; J. Llabres, "The First Cuban War-The Gunboats of 1870," Revista Genera De Marina, translation by D. Gibbard, appearing in Naval Notes, 9 and 10.

[45] Vessels that received extra decks included: Mary; Secret; Stag, b) Zenobia; Deer, b) Palmyra; Rothesay Castle, b) Southern Belle; and Chicora.

[46] Arthur C. Wardle, "Mersey-Built Blockade-Runners of the American Civil War," Mariner's Mirror, 28 (1942), pp. 182-185; "British Built Blockade Runners," Steamboat Bill of Facts, XI (December 1954), pp. 77-80.

The Dudgeon-built twin-screw Mary was left unfinished in the builders hands when blockade running ceased. They rebuilt her to carry cattle in the North Sea between London and Gothenburg. The Dudgeon yard added a spar deck that increased the depth of hold to twenty feet, two inches from the original 14.6 feet. The additional enclosed area increased the tonnage (builder's measurement) from 829 tons to 956.[47]

The sidewheelers Secret, Stag and Deer were also given second decks to increase capacity for service on the coasts of New England and the Maritime Provinces. The former Confederate cruiser Georgia was given a large superstructure and operated on the St. Lawrence and the New England coast. Thistle was rechristened City of Quebec in 1867.[48]

Two former blockade runners served on the St. Lawrence and later the Great Lakes as passenger steamers. Rothesay Castle was registered in St. John, New Brunswick and Chicora in Halifax, Nova Scotia through 1870.[49] They were cut in half to pass through the locks above Quebec and reassembled at Buffalo on the other side. Later both were again cut in half at Buffalo to pass through the Welland Canal

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[47] Bureau Veritas, "Navires A Vapeur," Repertoire General de la Marine Marchande A Voiles Et A Vapeur; Statistique Generale de la Navigation de tous les Pays Maritimes (Paris: Bureau Veritas, Registre International, 1870), pp. 90-92, 128.

[48] Bureau Veritas, Statistique General, 1870, p. 40; Silverstone, Warships, p. 72, 152, 180, 219.

[49] Bureau Veritas, Statistique Generale, 1870, pp. 36, 170.

and rejoined at Port Dalhousie. The former Clyde passenger steamer Rothesay Castle served for many years as Southern Belle. The "blockade-runner model" sidewheel steamer Chicora served as a passenger and package freight steamer until 1921, when she was converted into a barge and not broken up until 1938.[50]

Many blockade runners returned to Scotland and England where they were well suited to the passenger excursion trade. These included several surviving former excursion steamers as well as sidewheelers especially built for blockade running. Indeed the same Alexander Stephen slipway used to convert river steamers into blockade runners was used in late 1865 to reconvert them to carry passengers again.[51] Fanny and Alice, the former Sirius and Orion, were overhauled and repaired at Dumbarton on the Clyde before being put to work under their original names carrying passengers and cargo between Stranraer and Ireland.[52] The City of

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[50] F. E. Hamilton, "Chicora, A Blockade Runner Came to the Lakes," Steamboat Bill of Facts, XII (September 1955), pp. 49-52, 57; Virgil L. Gayner, "Famous Civil War Blockade Runner Chicora Ended 74 Year Career on Great Lakes," Cleveland Plain Dealer, June 7, 1953, in Chicora file at Great Lakes Historical Society, Vermillion, Ohio; Erik Heyl, Early American Steamers, II, pp. 227-228, and V, pp. 46-49.

[51] Alexander Stephens, Scribbling Diary, April 23 and July 28, 1863, August 3, 1864, March 11, 1865; William Leitch, "Kelvihaugh Slip Dock and Shipbuilding Yard," Linthouse Works Magazine (September 1920), pp. 9-12.

[52] "Steam Shipbuilding on the Clyde," The Artizan (October 1, 1865), p. 236; Bureau Veritas, Statistique Generale, 1870, pp. 149, 183.

Petersburg had her bottom cleaned and was repaired at Liverpool in early 1865 before beginning service between Liverpool and Dublin.[53]

Most of the blockade runners that had been captured by Union forces during the war entered coastal and river service in the United States. For instance, two ex-blockade runners built by William H. Potter, Palmyra, ex-Deer, and Zenobia, ex-Stag, entered service carrying passengers and package freight on the New England coast and to Bermuda.[54] At least ten other former blockade runners were owned in New York after the war.[55] Many were later sold for South American coastal service. Three other former blockade runners, Gussie Telfair, Winchester, ex-Calypso, and Pelican, even found their way to California, where they operated along the coast and down to Panama.[56]

Other former blockade runners ended up on the coasts and rivers of South America after the war. Many former runners were still owned by British companies or individuals as British and Scottish trades could not support so many specialized vessels. After some time in service they were sold abroad. American shipowners

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[53] "Steam Shipbuilding on the Clyde," The Artizan (June 1, 1865), p. 141.

[54] Bureau Veritas, Statistique Generale, 1870, pp. 152, 219.

[55] Entries for Lilian, Matagorda, Montgomery, Nick King, Rover, Ruby, Savannah, Teazer, Vixen, Wando, in "Navires A Vapeur," Bureau Veritas, Statistique Generale, 1870.

[56] Vessel notes in Erik Heyl Collection, Institute For Great Lakes Research, Bowling Green State University, Bowling Green, Ohio.

suffered from the same problem of more tonnage than trade would support. Both countries' shipowners had no recourse but to sell their excess ships and South American merchant fleets benefitted. South America had need of considerable tonnage for ordinary trade as well as for use as transports in the many regional wars.

In 1865 and 1866 Glasgow shipbuilder and owner Peter Denny speculated in disposing of several former blockade runners. He owned shares of several vessels with several former Confederate agents and blockade running captains. Along with Captain Carlin and Duncan MacGregor, Peter Denny disposed of the former Confederate ships Maude Campbell, Charlotte, Imogene, Hercules, and Tennessee. Most appear to have been sold in South America.[57]

The blockade running sisterships Deer and Stag had been captured, sold and renamed Palmyra and Zenobia in United States merchant service. They were sold to Argentinean owners in 1869 and 1867 respectively.[58] The blockade runner Kate, which had been captured and run the blockade again as G.T. Watson, was sold in 1867 by her American owners to the Pernambuco Steam Navigation Company of

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[57] Letter from J. N. Beach to Begbie, Liverpool, September 17, 1866; letter from Peter Denny to James Galbraith, February 16, 1865, in Denny Collection, University of Glasgow, Glasgow, Scotland.

[58] Silverstone, Warships, p. 221.

Brazil. She was named Potengi in that service. The Pernambuco company bought other similar vessels from British and American owners.[59]

A group of former blockade runners operated in the Caribbean, offering unwitting cover for former runners engaged in illegal pursuits. The Bahamas and other Caribbean islands found themselves with a large fleet of out of work blockade runners after the war ended. The Bureau Veritas ship registry for 1870 listed Alliance, Druid, Ella Warley, Emilie, Emma Valeria, the wreck of Fanny & Jenny, Irene, and Thomas L. Wragg, all formerly connected with running, as owned in Nassau. Nassau had no commercial steam vessels at the start of the conflict.[60]

Several former blockade runners ended up in the Pacific. Two worked on the shores of Australia. Edina was a barkentine-rigged, screw steamer built in 1854 by Barclay, Curle, and Company, of Glasgow. She made several runs into Galveston on her way out to Australia in 1862-63. Edina continued in coastwise service into the 1930s, was converted into a barge and not broken up until 1957.[61] The unusual runner Alliance, with three athwartships funnels and a turtleback over her entire

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[59] "Kate, no. 3106, Iron," Lloyd's Survey Report, National Maritime Museum, Greenwich, London, England; "Navires A Vapeur," Bureau Veritas, Statistique Generale, 1870, p. 159.

[60] This list was compiled from "Navires A Vapeur," Bureau Veritas, Statistique Generale, 1870.

[61] Photograph of ship in the Eldredge Collection, The Mariners' Museum, Newport News, Virginia; Will Lawson, Pacific Steamers (Glasgow: Brown, Son, and Ferguson, Ltd., 1927), pp. 60-62; "Edina," typescript vessel history enclosure to letter from Barry Crompton to Steve Wise, March 2, 1991.

length, also went to Australia. Under the name New Zealand, she was reported as a "famous" former blockade runner though her name in that service was never mentioned in print.[62]

Japan was another country that built a merchant steam fleet in the 1860s and 1870s, partially by purchasing older vessels from other nations. At least two former Confederate vessels sailed in Japanese coastal trade. Atalanta/Tallahassee/ Chameleon was sold after the war to a steamship company operating on the coast of Japan and was renamed Haya Maru. She wrecked on the coast of Honshu in 1869. The large single-screw runner and supply ship Bahama was sold in Japan and renamed Meiko Maru. She lasted in that service until 1884.[63]

The Shipbuilders

The shipbuilders who built blockade runners ranged from the largest shipyards in Great Britain to small firms building one or two ships a year. They ranged from old, established shipyards to fledgling yards that cut their teeth on blockade runners. So many ships were needed in a short time that most yards seeking such work

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[62] "The New Zealand - Late Blockade Runner," Illustrated Australian News (May 25, 1865), p. 7.

[63] "Loss of the Steamer Haya-Maro," London Times (August 14, 1869), pp. 1; "Terrible Shipwreck - Loss of the Steamer Haya-Maro Near Yokahama," The New York Times (July 31, 1869), p. 1; Kevin J. Foster, "Where They Lie: C.S.S. 'Tallahassee,'" The Confederate Naval Historical Society Newsletter, 6 (February 1991), pp. 4-7; Ridgely-Nevitt, American Steamships on the Atlantic, pp. 344-345; Silverstone, Warships, p. 222.

received building contracts. Many yards that built runners used them to supplement their regular construction but a few companies turned most of their production to building them. Jones, Quiggin, & Company of Liverpool built twenty-three potential blockade runners, and subcontracted out a further five; John and William Dudgeon of London built nineteen.

Ship-building had begun to be seen as a science early in the nineteenth century. Ship-building had also developed as one of the most advanced heavy industries of the century. The importance of continued naval superiority in the face of French and American advances caused the British government to focus much attention on naval technology. Government and naval representatives were often present on board experimental new ships on their trial trips. These included a number of blockade runners. Government recognition of successful designs led to renown and helped yards to obtain government and private orders.[64]

Only a few generalizations can be made for all blockade runner builders because of the wide range of companies building hulls and engines. Riveted iron ship-building was labor intensive: most shipyards that built blockade runners employed over 1000 men. The companies that built the most blockade runners

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[64] The trial trips of Dudgeon ships with Admiralty and other government agents aboard are good examples of such attention. See reports of trial trips of Flora, Kate, Hebe, Atalanta, and Louisa Ann Fanny. "Trial of the Hebe," The Artizan (May 1, 1863), p. 115; "Trial of the Hebe," London Times (April 28, 1963), p. 14; "Trial Trip of the Double Screw Steamship Kate," London Times (March 2, 1863), p. 1; "Trial Trip of the Kate," The Artizan (April 1, 1863), pp. 92-93.

generally specialized in merchant ships. The yards that mainly built for the Royal Navy were higher priced and although they tendered offers for blockade runners they did not receive many contracts. Blockade runners were built in all three major ship-building areas; along the Clyde River in Scotland, the Mersey River, and the Thames River in England.

Why did British shipbuilders build ships for the Confederacy? There were many inducements to do so. These ranged from prewar business connections and sympathy with the South, to the lure of easy money. Other motives might include a patriotic desire to keep British cotton mills supplied and operating, the chance to experiment and test pet theories of design, a yearning for adventure, and the desire to diversify the types of ships built by the yard.

One historian has asserted that one primary motive for building blockade runners was the chance to realize huge profits as "a substitute for the forbidden slave trade." British and Scottish shipyards enjoyed a ship-building boom fueled by orders for blockade runners and cruisers.[65] Some shipbuilders owned stock in blockade running companies or operated runners themselves.[66] Several shipbuilders combined the profit motive with what must have been a genuine belief in the ultimate success of

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[65] Warren F. Spencer, The Confederate Navy in Europe (University: The University of Alabama Press, 1983), p. 193.

[66] "'T.S. Begbie,'" Denny Account book, UGD 3/25, Glasgow University Archives, Glasgow, Scotland, p. 245, also see "Kentucky, Screw Steamer No. 32," p. 215; "Imogene," and "Universal Trading Co." p. 221.

the Confederate cause. Both Thomson and the Dennys invested large amounts of money in Confederate bonds, although they may have only accepted bonds because they despaired of ever receiving cash.[67]

Changes in International Law

The United States desired to prohibit as much trade with the Confederate States as possible during the war. Changes were made in international prize law to allow condemnation of any vessels involved in supplying the South, no matter where found. The Union was put in the new position of a strong naval power seeking to expand the strictures of prize law. The United States extended the doctrine of continuous voyage, which Britain was only to glad to accept, since they had invented it in earlier conflicts with France and the United States. Vessels that never approached, or intended to approach, Southern shores were captured on the high seas and condemned because their cargo was judged to be ultimately intended for the Confederacy.[68]

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[67] James and George Thomson, "Statement Shewing the Profit or Loss from the Undernoted Contracts;" see also entries for "Confederate States Bonds," and "Joint Spec. Confederate Loan," Denny, Account Book, University of Glasgow Archives, Glasgow, Scotland.

[68] The best discussion of changes in prize law is Bernath, Squall Across The Atlantic. For legal procedures see also Robinton, Introduction to Papers of the New York Prize Court. The Civil War greatly expanded the legally permissible limits of blockade. See Mallison and Mallison, "International Law and Naval History: Change and Continuity in the Juridical Doctrines of Naval Blockade," in Versatile Guardian: Research in Naval History (Washington, D.C.: Howard University Press, 1979), pp. 55-57. For a

The changes in prize law did not extend to allowing defensively armed merchantmen, however, as this would favor the Confederacy. Union merchant vessels would have to take their chances with rebel commerce raiders. To protect themselves, many Northern and Southern vessels used foreign flags for protection. Changes in national registry of vessels became commonplace during the conflict. Security measures and the protections of (illegal) multiple nationality were explored by merchant vessel owners of both sides, although blockade runners took the most thorough steps in that direction.[69]

Effects on Naval Architecture

Perhaps the most lasting consequence of the fleet of blockade runners built in Great Britain was the legacy of the high technology that they engendered. The new technology developed to meet the needs of blockade running rapidly advanced limits of performance and demonstrated its advantages. Technology advanced hull form and construction, superstructure design, propulsion and power plant design, cargo handling gear, and stealth design.

Steel hulled ships with light-weight construction followed Banshee and Phantom with increasing rapidity. Jones, Quiggin, the largest builder of blockade

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contemporary Confederate view see Scharf, Confederate States Navy, pp. 449-460.

[69] Charles Dana Gibson, Merchantman or Ship Of War: A Synopsis of Laws; U.S. State Department Positions; and Practices Which Alter the Peaceful Character of U.S. Merchant Vessels in Time of War (Camden, Maine: Ensign Press, 1986), passim.

runners, received orders for steel sailing clipper ships. Other more ordinary vessels followed as the price of steel fell and its advantages became better known. The search for the ultimate high-speed hull form, in such experimental high-speed ships as Presto and The Dare, helped to create practical results from previous theory. Safety was improved in many runners by thorough multiple compartmentation. Navigating bridges with enclosed wheelhouses also increased safety. The dispersion of former blockade runners around the world after the war spread such technology so that all could see its advantages.

Major advances in steam propulsion were made by the builders of blockade runners. They proved that steam propulsion was dependable enough to risk the possible loss of a ship and cargo if it failed. Most runners depended on steam as the primary propulsion method and many could not even carry sail on their minimal or non-existent rigs. Blockade runners proved that high pressure steam was safe under fire, and that surface condensers, steam superheaters, feedwater preheaters, and other devices for more efficient operation were valuable, and even necessary for economic reasons. Another new technology proven by runners was twin-screw propulsion, which was introduced by the first ocean-going twin-screw, Flora, and was proven by over twenty others. Keeping steam runners supplied with fuel proved to be a major supply problem for operators. The importance of available, high quality coal supplies was also proved by losses of steamers forced to use inferior coal and delays while waiting to be supplied.

Another blockade runner innovation was the use of machinery to speed and ease cargo handling in port. Most runners used heavy cargo booms attached to the masts for lifting cargo from the holds and overside. Cargo booms were uncommon in ships prior to the war; runners may have helped disseminate the technology. Many ships were fitted with hand-operated cargo winches to ease and speed cargo handling. Several late war steamers of the larger class had steam cargo-handling winches, powered by donkey boilers.[70]

Blockade runners also pioneered the use of stealth technologies such as minimal superstructures, optical camouflage, quiet propulsion systems and smokeless coal. Eventually all of the world's navies followed suit in wartime: painting ships in camouflage, minimizing detection by sound, and avoiding long range detection by the elimination of smoke.

Conclusion

The measures employed to allow steamships to trade with the blockaded Confederate states greatly expanded the technological limits of the day and portended what the future might bring. The success or failure to pass the blockade became a grand experiment to produce the ultimate blockade running vessel. Those that did succeed had a long reaching effect. The hull forms of later fast liners and torpedo

[70] "Specifications of Iron Paddle Steamer," in Ella, Caroline, Emily envelope, Denny collection, University of Glasgow, Glasgow, Scotland.

boats echo those developed for blockade runners. The materials and construction methods of most oceangoing ships benefitted from the experience gained in building very light, high speed hulls. Propulsion changed as runners took paddlewheels to their ultimate development and introduced twin screws. Reports of such successes, and associated failures, in the engineering journals disseminated the lessons learned far and wide. Experiences gained in building ships to run the Union blockade changed the form and fabric of ships that followed.

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