



By Gerald Hawkins

In the beginning of the winter 1861, Washington and the Buchanan Administration in particular were faced with a situation without any precedent. South Carolina had just seceded from the Union on December 20, 1860, followed on January 9, 1861, by Mississippi, Florida, Alabama, Georgia and Louisiana would soon join these States in the same month. Texas would close the list on February 1, 1862. Amidst this tense climate, Abraham Lincoln was elected on November 6, 1860, and sworn in as 16th president of the United States on March 4, 1861. A few days after Lincoln's entrance to the White House, a cabinet was constituted and composed of statesmen whose rivalries personal ambitions and corruption would fuel the political chaos that developed at the end of 1861. Under pressure from influential politicians and faced with the outcry from the general public, the president would soon be forced to reshuffle his administration.

Out of all these politicians an odd character however stood out, Guideon Welles. Born in 1802 in Connecticut, Welles became a journalist who found his way into local politics. He later served as editor of the "Hartford Times" and held many official positions in his native State including considerable responsibilities in the Department of the Navy. Old Democrat, he joined the Republican Party in 1855 and during the years preceding the elections, his personal and professional qualities attracted Lincoln's attention. Both men displayed similar viewpoints on the Union and on slavery issues. They would ultimately become loyal lifetime friends and, from then on, Lincoln would address Welles by the nickname of "Father Neptune". To complete the administration, one position remained open, that of Secretary of the Navy. The president's choice pointed out to the faithful Welles. The latter was somewhat hesitant since he was only vaguely familiar with that department and moreover, he had never set foot on a ship. Welles nevertheless accepted the appointment. His intelligence, his perspicacity, his efficiency and, most of all, his persistence would make up for the lack of job acquaintance.

Further south, the deputies of the States that had seceded met in Montgomery, Alabama, on February 4, 1861. On the eighth of that month, they adopted a provisional constitution and on the ninth Jefferson Davis was elected president. While modelling his

administration, Davis selected Stephen Russel Mallory to fulfil the position of Secretary of the Navy. Mallory was born in Trinidad in the Caribbean in 1813. Orphan at the age of six, he immigrated to the United States and settled down in Key West where, aged only 19, he became Customs Superintendent. After his studies he became a lawyer. He then joined the army for a short period of time and saw action in the second Seminole war¹. From 1851 to 1861 he represented Florida in the Senate as president of the Naval Affairs Committee. Mallory was quite an educated man who possessed an iron will. One of his major qualities was tenacity and nothing could prevent him from succeeding. Although he lacked experience in the navy, his previous positions as jurist of the Federal Admiralty in Key West and as Senator-President of the Naval Affairs Committee had compelled him to become familiar with all aspects of the department and more specifically with those related to ordnance and naval construction. As a matter of choice, Davis could not have made a better one.

War was merely two months away when Mallory took office, but the threat of conflict was already becoming strong. Union ships dispersed at the four corners of the world were slowly returning to their homeports, some of them steering to Southern harbours. At the mouth of the Mississippi River, ships bound downstream or upstream were being searched. Florida's State militia even tried to seize the Federal schooner, *Dana*. Several secessionist States demanded that the Federal vessels anchored in their harbours be turned over to them. Many captains simply refused to obey and fled with their craft, notably John Newland Maffitt who would later become an outstanding Confederate commander, and David D. Porter, a future brilliant Union naval officer.

Even before the Confederate government was organised, a committee had been created to gather "*all such persons versed in naval affairs as they may deem advisable to consult with.*"² At this time only a few high rank officers had deserted the Union, five captains and four commanders. Telegrams were then sent to all officers of Southern sympathy. The response was most positive. By June 61, one fifth of the recipients had resigned their commission, among them 6 captains, 34 commanders and 76 lieutenants. One of them was Raphael Semmes, member of the Lighthouse Board of Washington, who would become one of the most famous raiders of all times. Another was John M. Brooke, known for the guns of his invention being cast at the Tredegar Iron Works of Richmond. Still another was John Taylor Wood, instructor at the Naval Academy and grandson of President Zachary Taylor.

When the Confederate navy was created by an act of Congress, Stephen Mallory was responsible for a fleet that existed only on paper. In February 61 its fighting power was limited to fifteen guns spread out on some ten crafts hastily converted into gunboats. The South was lacking almost everything: specialised workshops, qualified mechanics, naval carpenters, trained seamen, but most of all raw materials. Two naval yards were then in operation, one in Pensacola, Florida, and the other in Norfolk, Virginia. There were three rolling mills, two in Tennessee and the other in Georgia. The Tredegar Iron Works in Richmond constituted the sole foundry capable of casting heavy ordnance. Before the war, the South had built only seven steam vessels and their machinery had been purchased from northern firms.

Gideon Welles was in no better position than his Southern counterpart. On April 6,

¹ The Seminole Indian nation lived in Florida during the 19th century. Three conflicts called the Seminole Wars occurred between the United States and these Indians. The first one, between 1817 and 1818, ended with the transfer of Florida by Spain to the United States in 1819. The two others, between 1835 and 1842, and between 1855 and 1858, resulted in a systematic purge of the Seminoles who were ultimately deported to the West.

² Jones V.C., *The Navies Begin* in *The Image of War*, Vol. 1 - p. 219

1861, the Federal navy numbered 90 ships of all classes of which 50 were unsuitable for service. Of the remaining forty, twenty-four were steam powered and out of these, thirteen were on foreign missions and seven assigned to supplying Fort Pickens at Pensacola, Florida and Fort Sumter in South Carolina. Welles therefore disposed in reality of four ships totalling 25 guns! He immediately set to work with all his energy. Anything that could float was bought or requisitioned and no less than 136 vessels of all types were pinpointed to be refurbished and armed. In addition, the construction of 52 new ships was ordered from private firms.

While the Department of the Navy was busy developing a fleet from scratch, Welles' mind remained focused on the situation at the Gosport Navy Yard in Norfolk, Virginia. This naval yard was one of the most important of the Union with its dry dock, numerous workshops and stores filled with ordnance and ammunition. No less than nine vessels were presently moored at Gosport. Three in particular, the *Minnesota*, the *Roanoke* and the *Merrimac*³ were considered the pride of the Federal navy. These identical frigates had been built in 1856. Each displaced 3,200 tons and was armed with forty guns. Only the *Merrimac* was steam driven while the other two were traditional sail ships. Built at the Boston Navy Yard, the *Merrimac* had roamed the Pacific Ocean and the coasts of Latin America from 1857 to 1859 before ending in a dry dock at Norfolk for a general overhaul and engine repair. The loss of Norfolk and its contents would constitute a severe blow to the Federal ... and a superb present to Stephen Mallory. As of April 6, Welles had gone to the White House to convey his fears to Lincoln: "*Mister President*", said Welles, "[...] *If Virginia secedes from the Union, Norfolk will fall in the hands of the Confederates. The ships lying there are the first of a new generation ; they mark the transition from sail to steam. The Merrimac in particular is one of our most advanced warships, and according to my secretary, Mr. Fox, the most valuable in the fleet. We can ill afford to loose her.*"⁴ After having listened carefully, Lincoln said: "*Father Neptune, why do you assume that we are going to lose the yard at Norfolk*"? This reply no doubt reflects the President's optimistic outlook on the eve of the coming conflict.

Although most rumours running in the South and in Washington itself indicated an imminent rupture between Virginia and the Union, Lincoln refused to believe them and remained convinced that there was no cause for alarm. His major concern consisted in the reinforcement of Forts Pickens and Sumter, two isolated Federal enclaves threatened by Confederate forces. The situation was indeed very tense in Pensacola, at the mouth of the Mississippi River. On the day after Florida seceded, the local militia immediately occupied Forts McRae and Barrancas, which were evacuated, and their personnel relocated to Fort Pickens, a more defensible position. A squadron headed by Captain Henry Adams and consisting of numerous ships including the *Brooklyn*, the *Sabine*, the *Macedonia* and the *Saint Louis* had already been sent in the bay to supply this stronghold. Referring to a tacit agreement with the Buchanan Administration⁵, Braxton Bragg, who commanded at Pensacola, was firmly opposed to any reinforcement of Fort Pickens. As for Adams, he did not dare a landing since he was afraid that this action might be interpreted as an act of war. He would rather wait for instructions from Lincoln. The President convinced that it was his duty to defend all Federal possessions, decided to breach the status quo by transmitting precise directives to Adams. It was immediately

³ The name of this frigate is commonly found spelled *Merrimac* and *Merrimack*.

⁴ Mokin A., *Ironclad*. p. 7

⁵ In an attempt at reconciliation to avoid a conflict between the North and the South, James Buchanan, 15th President of the United States and predecessor to Lincoln in the White House, had promised not to reinforce the Federal forts, among them Pickens and Sumter, provided that they were not attacked by the Confederates.

decided to send lieutenant Gwathmey to Florida, the latter just returning from Pensacola with fresh news. Unfortunately, Gwathmey preferred to embrace the Southern cause and stood down at the last moment. The task of finding another messenger fell on Welles who in turn passed it on to his assistant, Captain Gustavus Vasa Fox. The quest pointed out to John Lorimer Worden, a forty-three-year-old lieutenant, and a veteran of twenty-seven years in the navy who had the reputation of being a loyal officer, respectful of his superiors. Not fully convinced but pressed for time, Welles decided that Worden would do to fulfil the mission.

With instructions in his pocket, Worden left Washington for Florida. After a trouble-free journey he boarded the flagship *Sabine* where he handed over Lincoln's orders to Adams. These stipulated to supply Fort Pickens at all costs. In the meantime, lieutenant Gwathmey who had just arrived in Montgomery hurried to inform Stephen Mallory of Worden's mission. Mallory immediately telegraphed General Leroy Pope Walker, the Confederate Secretary of War, requesting him to put Worden under arrest without delay. Worden, who had already left Pensacola and was on his way to Washington, was apprehended in the outskirts of Montgomery and thrown in jail on charge of espionage. The matter created a lot of noise and hit the local newspaper headlines. Welles who was kept informed remained however powerless to deliver his emissary since Lincoln had forbidden any dealings with the Confederate States, which in his mind did not exist. Worden would therefore sojourn in jail during many months, but his career would not end there as we shall see further.

Welles had more important things to do than worry about Worden's condition. He remained obsessed with Norfolk and its contents. He had just discussed with Winfield Scott, the general in chief of the army, the possibility of providing a squadron and a few troops to defend Gosport. The old Scott, then 75 years old and suffering from gout, was somewhat overtaken by events. Ever complaining on the lack of men and equipment, he nevertheless agreed on April 16 to send the frigates *Pawnee* and *Cumberland* with more than 1,000 men on board to Norfolk. Their mission would be to save the naval base, if possible, if not, then destroy it. Captain Hiram Paulding was put in charge of the expedition while the task of defending the base itself fell upon commodore McCauley, the superintendent of the yard. Observing that the latter remained totally idle and doubting on his loyalty to the Union, Wells had previously dispatched to the yard commander James Alden to assist the navy engineer in chief, Benjamin F. Isherwood. Both were to convince McCauley to speed up the repairs of the *Merrimac* so that the frigate be transferred to Philadelphia. McCauley showed little or no initiative, finding all kinds of excuses to justify his lack of action. Work on the frigate nevertheless progressed but on April 18 the *Merrimac* was still in no condition to be moved. "*Deliver me of timid military men*" wrote Welles in his diary that evening.

On April 12, after an ultimatum from Beauregard to Anderson, the first shells fell on Fort Sumter: the Civil War had just begun. After a desperate two days resistance, Anderson brought down the colours and surrendered. This first act of war reinforced the arrogance and optimism of the South. Many in Montgomery predicted that the Confederate flag would soon be floating on the Capitol of Washington. The events were taking on momentum. On April 14, the 44-gun frigate *Sabine* began to blockade Pensacola. Two days later, President Lincoln called for 75,000 volunteers for a period of three months. Finally, Virginia seceded from the Union on April 17. Welles had taken a proper view of things on that sixth of April during his meeting with the President! On the same evening Scott still suggested to send two or three companies of marines to reinforce Norfolk. "*A classic case of too little, too late*" would note Welles. April 18 would

constitute the crowning moment: the arsenal of Harper's Ferry fell into the hands of the rebels. More than 20,000 rifles, spare parts and machine tools were seized and moved to Confederate arsenals. The South once more exploded with joy and anti Union slogans made the headlines of most of the Southern press.

A wind of panic and even hysteria then swept throughout the North. General Scott felt that Washington was in great danger. Militia troops and battalions of volunteers were stationed at all corners of the capital to protect public buildings. Guns and ammunition were distributed to civil servants who were handling firearms for the first time in their life. Guns were even positioned in the corridors of the Capitol! On April 19, President Lincoln ordered the blockade of all Southern ports. In the eyes of all, including the European powers, this proclamation was an empty threat since 40 operational Federal vessels could not pretend to control 3,500 miles of coast, not mentioning thousands of Southern harbours and estuaries. It was reported on the same day that troops on their way to the capital from Massachusetts and Pennsylvania had been attacked in Baltimore by a furious mob. Moreover, the bridges between Baltimore, Harrisburg and Philadelphia had been destroyed. All means of communications between Washington and the North were suddenly severed. "*We are practically at the mercy of the enemy*" would comment John Hay, Lincoln's secretary.

At the Norfolk Navy Yard, disaster piled upon misfortune. Lieutenant Henry Wise who had also been sent by Welles to Gosport to save the *Merrimac* reported that the naval forces dispatched by Scott a few days earlier had arrived at the base on April 20. Wise was welcomed ashore by an excited McCauley who informed him that he was on his own since the entire work force, mostly Southerners, had deserted. Fearing the danger, he had just given the order to scuttle all ships in the base. This order would be his last act of command since from that moment on Paulding took control of the operations. In the meantime, Wise ran towards the *Merrimac* and boarded her. He then threw a piece of wood in the hold of the ship only to hear the sound of a splash indicating that water was over her middle deck. Informed of this situation, Paulding decided to blow up the dry dock and fire the yard and ships. According to orders, Wise laid the powder train. The deck of the *Merrimac* and those of all other ships were soaked with turpentine. At two o'clock in the morning, torches were lit and thrown at their targets. Within minutes ships and wooden structures in the yard were engulfed in flame. However, either by negligence or most probably due to lack of time, the dry dock, machine shops, forges and gun stores remained undamaged. Satisfied nevertheless with his accomplishment, Paulding steamed back to Washington with the *Pawnee* and *Cumberland*, leaving the yard virtually intact for the rebels. On that evening Welles would write in his diary: "*The arsenal at Harper's Ferry, and now the Navy Yard at Norfolk. We are the laughingstock of the world. It appears our military are not even equal to the task of destroying their own resources.*"⁶

When the news of Virginia's secession and the seizures of Norfolk and Harper's Ferry reached Montgomery, the town exploded with joy and excitement. One citizen in particular, Stephen Mallory, had special reasons to rejoice. He had just received from Welles a magnificent present consisting in a modern and well-equipped navy yard. The ashes at Gosport were not yet cold that Mallory ordered the salvaging of all that was possible: many vessels of which the *Merrimac*, the dry dock, large quantities of weapons, ammunition, food and finally more guns than were necessary to outfit the Confederate navy. In one of his first reports to the government, Mallory had pointed, out as Welles had previously done, that he was looking for ships immediately available. He furthermore

⁶ Mokin A., *Ironclad*, p. 87.

had sent to Great Britain an agent, James Bulloch, with a budget of 2,000,000 \$ to build ships for the Confederacy. Although it was forbidden by his Majesty's subjects to help a nation at war, Mallory knew that the British authorities were willing to look the other way. By the end of May, the Southern navy still numbered only ten ships totalling fifteen guns.

The Confederate Department of the Navy had been structured like its federal counterpart. It was divided into four bureaus, each affected to specific functions: personnel and its assignment, food and equipment supply, medical service and, most important of all, the service of Ordnance and Hydrography. Due to the lack of immediately available naval yards, except for those of New Orleans, Mobile, Pensacola and Norfolk, the South had to resort to empirical methods to create its navy. Its secretary was responsible for the naval construction and its promotion. Lieutenant John Mercer Brooke and builder in Chief John L. Porter, both specialists in naval ordnance, assisted him in his task. Chief Engineer William P. Williamson aided by ship manufactures such as J. Pierce and W. Graves completed the team. In reality, the chief constructor drafted the specifications. Besides these technical responsibilities, he was also in charge of the navy's strategy. It must be realised that there was then no one who co-ordinated the Confederate naval operations. To compensate for this shortfall, a wise Mallory resorted to consult his most competent officers. He moreover gave "carte blanche" to the squadron commanders regarding local operational matters. When Mallory took stock of the situation of his administration on May 8, he addressed the Naval Affairs Committee in these terms: "*I regard the possession of an armoured ship as a matter of the first necessity. Such a vessel at this time could traverse the entire coast of the United States, prevent all blockades, and encounter, with a fair prospect of success, their entire navy.*"⁷ His reference to the blockade was presently no exaggeration. All along the Atlantic coast, it was mostly a matter of bluff. Lincoln soon realised this and to strengthen the Union control of the Southern coasts, he appointed an overall commander, Commodore Silas H. Stringham. Steps were simultaneously taken to block the Mississippi River. Commander Rodgers was assigned the task of developing a naval force along that major stream. At the same time, James Eads of St Louis in Missouri began the construction of his "Pook turtles", the most famous one being the *Cairo*⁸.

When Mallory was President of the Naval Affairs Committee in the 1840's, the navy had already attempted to use iron for the armouring of vessels. After many years of undertaking and the spending of many thousands of dollars, the venture was considered a flop. Mallory however had never been quite convinced by the navy's verdict. He knew that France had used iron to armour the frigate *Gloire* and that Great Britain was in the process of building the *Warrior* entirely of iron. He however also realised that no arsenal capable of building from scratch an armoured frigate powerful enough to force the Northern blockade existed in the South. Captain L. Rousseau of New Orleans confirmed that there was not a mill in the vicinity capable of casting iron plates 2 to 5" thick. Moreover, the army had passed contracts with most of the foundries of Tennessee, Kentucky and Georgia. In any event, these foundries were unable to modify their tooling to roll iron plates of the required size. The Tredegar Iron Works of Richmond was possibly the only mill that could respond to the navy's demand.

⁷ Jones V.C., *The Navies Begin in The Image of War*, Vol. 1- p. 220.

⁸ See article of the same author : *USS Cairo*, CHAB News 1990, Vol. 18 - nr 4.

Despite all the bad reports, Mallory persisted in his theory. If he could somehow build an armoured frigate before the Union did, he could in one go redress the balance of power between both fleets. To meet this objective however, he needed to win the race. According to the Confederate secret services, the Yankees had presently no intention of building an armoured vessel. A copy of a secret report prepared for Welles by John Lentall, chief of US naval constructions, landed miraculously on Mallory's desk. This paper concluded "[...] *the vast dimensions, the cost and the time necessary to build a steam armour-clad are such that it is not recommended to follow this course for the moment.*" Hoping that Welles and the US Navy would follow the report's recommendation, Mallory turned his mind back to the Gosport Navy Yard. While examining the treasures left behind by the Federal, he suddenly began to envisage the nucleus of a Confederate navy. Contrary to Welles, Mallory could quickly translate his will into action. The Confederate government was still in its infancy and its bureaucracy had not yet turned sclerotic.

On June 7, 1861, a short while after the transfer of the Confederate capital from Montgomery to Richmond, John Mercer Brooke wrote to his wife that Mallory had asked him to prepare the plans of a new ironclad. Brooke took only a few days to finish the specifications that Mallory immediately approved. Since the designated builder did not prove equal to the task, Mallory summoned to Richmond the chief builder, John L. Porter, and the engineer in chief, William P. Williamson. During the meeting Brooke and Porter discussed and compared their projects. The final design was to give birth to the *Virginia*, which constituted only phase one of the Confederates programmes. Faced with the difficulty of buying or building ironclads abroad, Mallory resorted to concluding agreements with Southern firms for the construction of such crafts. Upon hearing of the development of a Federal gunboat flotilla at St Louis, spies were sent to the building yards of Missouri to gather any interesting information. The reports would lead Mallory to improve the defences of New Orleans to prevent a sudden attack coming from the north although it was rather expected from the Gulf of Mexico. The construction of ironclads however remained a priority. Work had commenced on the *Arkansas* and the *Tennessee* at Memphis while the *Mississippi* and the *Louisiana* were being built at New Orleans. Back in Great Britain, Bulloch had met with some success: he had concluded the construction of the *Florida* and the *Alabama*.

Let us come back to the *Virginia*. Although the specifications and drawings were ready, the Brooke-Porter Williamson team had to face hard facts: they would not find in Norfolk or anywhere else in the South a steam engine powerful enough to propel the new ironclad. Nor was there any local manufacturer capable of delivering such machinery in a reasonable amount of time. The *Merrimac* laying in the Norfolk Navy Yard attracted once more the attention of the three men. Only her upper deck had been gutted by fire and the damage was minimal. While inspecting the ship's engine, engineer in Chief Williamson had the sudden bright idea of carrying out the necessary repairs and modifying the frigate into an ironclad rather than building one from scratch. After deliberation, the Porter-Brooke-Williamson team presented their new project to Mallory. The latter, quickly convinced, enthusiastically approved the proposal. Porter and his associates refined the design of the *Virginia* from 28 June until July 1, 1861. A final briefing was held on July 11 and Mallory gave the order for work to commence on the ironclad at once.

The funding of the project had however to be approved by the Confederate government. In early July, Mallory reported to Congress: "*The frigate Merrimac has been raised and docked at the expense of 6,000 \$, and the necessary repairs to hull and*

*machinery to place her in her former condition is estimated by experts at 450,000 \$. The vessel would then be in the river, and by the blockade of the enemy's fleets and batteries rendered useless. It has therefore been determined, at a cost of 172,500 \$, to shield her completely with three-inch iron, placed at such angles as to render her ball-proof, to complete her at the earliest moment, to arm her with the heaviest ordnance, and to send her at once against the enemy's fleet. It is believed that thus prepared she will be able to contend successfully against the heaviest of the enemy's ships, and to drive them from Hampton Roads and the ports of Virginia".*⁹ Since it was not evident that the politicians of the old guard shared the progressive views of the Secretary of the Navy, Mallory had bet on the legendary miserliness of Congress to obtain the funds. Needless to say, both Houses ratified the cheapest project.

There was so far no precedent of an ironclad involved in battle. The engineers had therefore to improvise based on theoretical hypotheses. The first and by far most empirical problem lay in the armour. The Tredegar Iron Works had the reputation of being the best-equipped mill of the South and naturally, it received from the Confederate authorities an order for variable lengths of rolled iron plates, one inch thick and eight-inch wide. This unique order implied fundamental modifications to the mill's production machinery, the facility having been designed to cast heavy guns only. The rolling mill was however quickly converted, and the plates delivered within a week. In the meantime, Brooke had ordered live firing tests on iron plates with the outcome that one-inch thickness was insufficient. The first order was cancelled for a second one consisting of plates two inches thick, the maximum that could be rolled by the mill. This change of mind led to further delay. In the original contract, the iron plates were delivered with the fixing holes already punched during the rolling process. This was impossible with thicker plates so that each one had to be drilled manually, task which increased the labour time and thus the cost. Although the Tredegar Iron Works were submerged by large orders for heavy ordnance, priority was given between October 61 and February 62 to the production of the iron armour of the *Virginia*.

Manufacturing the armour plates was one thing but transferring them to Norfolk was another. The Southern railroad network was then sparse and compared to that of the North, its quality of its services left to be desired. Moreover, the Ordnance Department of the land forces had requisitioned most lines. Under the army's pressure, it flatly refused to spare a single locomotive to the Department of the Navy. Because of this lack of co-ordination, rivalries between branches of the service would only worsen throughout the war. Using secondary lines and rolling stock on temporary loan, the navy was then forced to route all the iron plates from Richmond to Norfolk through ... North Carolina. In the meantime, the armour plates were piling up at the Tredegar Iron Works, and by Christmas 1861, the *Virginia* or *Merrimac* was still far from completed. The last plates were bolted on the ship's hull on January 27, 1862. This achievement was only made possible by the spontaneous goodwill of the yard crews who, since July 11, had accepted to work overtime until 8 PM, seven days a week, without extra pay. The Southern cause was then still capable of displacing mountains!

In Washington during the spring of 61, the response to Lincoln's war proclamation had been spontaneous, magnificent if not delirious. Patriotic and public donations as well as other various loans amounted to 23,000,000 \$ within three weeks. The average citizen was now getting tired of the Confederate rebellion and the Southern arrogance. The latest

⁹ Jones V.C., *The Navies Begin* in *The Image of War*, Vol. 1- p. 221.

insolence had been the relocation of the Confederate capital from Montgomery to Richmond ... right on Washington's doorstep! "*What a nerve*" thought Lincoln. "*Forward to Richmond, forward to Richmond*" repeated Horace Greely in a series of fiery editorials of the "Tribune". In the meantime, General Lee, Davis' military advisor, had organised two armies. Joe Johnston commanded one that was encamped in the Shenandoah Valley, not far from Harper's Ferry. The other under General P.G.T. Beauregard was stationed near Manassas Junction, some 30 miles south of Washington.

To ease the pressure on his Administration and to avoid losing popular support, Lincoln suggested an attack on Manassas. A victory would appease public opinion and bring Federal troops nearer to Richmond. Winfield Scott, the General in Chief of the army, did not share the President's view. He rather believed in his Anaconda plan, or total blockade concept with the closing all Southern ports on the Atlantic and Gulf coasts, while simultaneously building up the army. "*How many men and how long to achieve victory?*" asked Lincoln. "*Three hundred thousand and three years*" replied Scott. Time would prove this right. Under pressure from public opinion, the military strategy bowed to the political necessities of the moment. On July 20, 1861, McDowell, promoted commander of the Army of the Potomac, was ordered to attack Beauregard at Manassas with 30,000 men. The first pitched battle of the Civil War, that of Bull Run, ended in a disaster for the Union. Scott was right when he told Congress "*Little piecemeal wars would simply bleed the country white.*"

The Sunday evening of Bull Run found Welles in his office at the Navy Department cleaning up some correspondence. A note of paper on his desk drew his attention. It was a confidential report informing the Secretary of the Navy that Stephen Mallory had recommended to the Confederate Congress the construction of ironclad vessels of war. Welles knew that the South, with her lack of industrial resources, was in no position to build an ironclad. His interest was nevertheless piqued. If Mallory showed so much interest in those vessels, then there must be something to them. Welles was also well aware that on the subject of naval architecture, he was out of his depth and that his rival Mallory was by far more knowledgeable. It was Mallory who, as Chairman of the US Senate Naval Affairs, had headed the enquiries on the Stevens batteries. Stevens, an engineer from Hoboken, New York, had convinced Congress in 1842 to allocate him funds for the construction of an ironclad steam battery. He was consequently allocated 250,000 \$ for the project. In 1856, 14 years later, the battery was still incomplete, and Stevens petitioned for an additional 812,000 \$ to finish the job. The problem with Stevens is that each time that he came up with a new armoured hull, a new gun appeared that was able to pierce it. Finally, the navy refused to invest any further and the project was scrapped.

Immediately after the fall of Fort Sumter and at Welles' express request, a naval board was set up to re-examine Stevens' rusted batteries. The outcome came without appeal: the ironclad battery was rejected because of its excessive draft, lack of speed and manoeuvrability. Despite the conclusions of the board and the Lenthall report, Welles' intuition convinced him to give the navy another chance to re-evaluate iron as a shipbuilding material. This proved no easy task. First, a majority of the senior officers was predisposed to reject the concept and Welles knew that their opinion would be critical with Congress. Secondly, since the naval bureaucracy remained attached to centuries-old traditions, there was little chance that it would willingly accept changes proposed by politicians with progressive ideas. Wood and sail had rendered the best of services up to now, so why change for iron? Welles summoned his assistant secretary, Gustavus Fox, requesting him to study the problem in depth and to prepare a proposal that would suitably

fit into the President's forth of July address to Congress. This message was in reality a petition for legal sanctions and the necessary means to put down the rebellion. Lincoln requested no less than 400,000 men and 400,000,000 \$ to pursue the war effort. This solicitation also included the recommendations of the Secretary of the Navy. Congress readily approved the Presidents demands and funds ... whereas it would deal with Welles' proposal in due time.

Welles was desperate since time was running out. Luck then stroke him unexpectedly. On July 18, a Pinkerton agent¹⁰ handed him a copy of a recent report from Mallory to President Davis that described the progress made on the *Merrimac*. Welles received this news like a cold shower. His fears that his rival would somehow be able to produce an ironclad were realised. On the following day, Senator James Grimes of Iowa, informed by Welles of the Southern intentions, introduced a bill directing the Secretary of the Navy to appoint a board of three competent naval officers charged with investigating plans for the construction of armoured steamships or armour-clads. On August 3, Congress endorsed Grime's proposal and finally appropriated a budget of 1,500,000 \$ for the construction of armoured batteries, subject to the board's approval.

Welles rejoiced. He immediately wired all the northern newspapers for a classified advertisement under the heading "Ironclad Steam Vessels". The announcement stated that the Department of the Navy was open to offers for the construction of one or more steam driven ironclads. The vessels should not draw more than 10 to 16 feet of water; each was to carry an armament of 80 to 120 tons and supplies for a crew of 165 to 300 men. Two masts and the necessary rigging should complete each ship. Bidding intentions were to be submitted by August 15 and the final offers by September 3. The response was immediate with mail coming in by wagonloads to the Department of the Navy. Reviewing all these letters was an impossible task and only the more presentable envelopes were opened. The remaining was simply discarded; such was the fate of the missive from one Captain Ericsson.

The board of three competent naval officers was created without delay. It consisted of Commodore Joseph Smith, chief of the Bureau of Yards and Docks, of Commodore Paulding (the same as in Norfolk) and of Commander Charles Davis. All three men had accepted the appointment with reluctance. Even though they all displayed numerous years of experience in naval construction, they informed Welles that they knew little or nothing about ironclads and approached the job with total lack of confidence. Welles responded that "*he had information to the effect that a small army of men was working night and day to ready the Merrimac for sea, and that it behoved the commodore and his colleagues to educate themselves without delay.*"¹¹

On September 3, deadline for the submission of the bids, the board made the first of three awards to Cornelius Bushnell of New Haven, Connecticut, a friend of Welles and businessman who owned a naval yard along the Quinnipiac River. The contract for the *Galena* specified the construction of a steamboat with a wooden hull and double armour on the exposed parts only. Bushnell should have felt happy after the award, but he was not altogether pleased. As a professional in the trade, he had serious reservations about building this hybrid ship. Moreover, many knowledgeable naval officers expressed doubt that the *Galena* would be able to carry such a heavy armament and qualify for combat. On his way to his hotel, he accidentally bumped into an old friend, Cornelius H.

¹⁰ E. J. Allen created the Pinkerton National Detective Agency in 1850. This private detective had cast a solid reputation for himself since 1842 while specialising in contraband cases and railway hold-ups. The agency operated during the entire Civil War as secret services of the North.

¹¹ Mokin A., *Ironclad*, p. 140.

Delamater who owned a foundry and machine works in New York. In need of reassurance, Bushnell explained to his friend that he had just signed a contract for the construction of the *Galena*, but since he was no engineer, he was concerned about the weight of the armour plating and thus the seaworthiness of the ship. Delamater replied that he knew just the man, a competent naval engineer named John Ericsson, who could answer all these questions. The next day, Bushnell and Delamater rode to New York to meet him. After some swift calculations, the Captain Ericsson reassured Bushnell on the question of the weight of iron and confirmed that the project was sound. As his guests were about to leave, Ericsson grabbed an old shoebox, opened it and took out a pasteboard model of a strange vessel¹², the likes of which Bushnell had never seen. The craft had a flat deck rounded at bow and stern without structures or riggings of any kind. The exception was a cylindrical revolving tower with two guns and a pilothouse. Iron plates covered the deck and overhung the hull fore and aft, thus providing protection for the rudder, anchor and propeller. The truly exotic aspect of the vessel was that most of it lay underwater: by heavy seas, the deck would be constantly awash emerging only one foot above the waterline. The bottom was flat and because of its reduced weight, the vessel only drew ten feet of water. Ericsson finally concluded "*her design is so simple that within ten weeks after commencing construction I can have her under the rebel guns at Norfolk.*"¹³ Although Bushnell could barely believe his eyes and ears, his thoughts were racing. The navy just had to have this vessel!

Willing to sacrifice his own project, and with Ericsson's consent, Bushnell swiftly returned to Washington with the inventor's plans and drawings under the arm. He there tried to convince Gideon Welles in adopting the new model, however odd it may look with only two guns and a crew of fifty men. He then called upon Henry Seward, the Secretary of State. After a short presentation where the merits of Ericsson's vessel and the speed of its construction were pointed out, Seward was immediately convinced¹⁴ and, without further ado, handed Bushnell an introduction letter to meet the President. Weapons of war had always fascinated Lincoln and the door of the White House had always remained opened to all inventors, even the weirdest. He immediately showed enthusiasm for Ericsson's battery. The naval board had however still to be convinced. Only commodores Smith and Paulding were at the Department on that day. The presentation of the project produced only partial results since the board hesitated to decide in the absence of Charles Davis. Bushnell was therefore invited to come back later. He did so the next morning and, backed up by Welles, went through his presentation again. The first impression of the board was negative; a final decision would be made the next day. The verdict finally fell on September 12, and to Bushnell's dismay, the board of officers rejected Ericsson's project as impractical, "*a cheese box on a raft*" according to Davis. One solution remained to Bushnell, that of convincing Ericsson to personally come to Washington and present his invention. Ericsson was in bad terms with the Federal Navy

¹² Ericsson went to France in 1854 to present the model of his ironclad to Emperor Napoleon III in the hope that that his revolutionary concept be accepted and that his vessel may play a role in the Crimean War. France rejected his proposition on the grounds that "*the results to be obtained would not be proportionate to the expense or to the small numbers of guns that could be brought into use*". Napoleon nevertheless expressed his gratitude to the inventor by presenting him with a gold medal bearing the imperial seal.

¹³ Mokin A., *Ironclad*, p. 143.

¹⁴ At the beginning of the war, foreign powers were inclined to back up the South without however giving recognition to the Confederacy. William Seward, Secretary of State, feared that if the North flinched, a European intervention would be inevitable. One method to prevent this was to hermetically blockade the American coasts. Seward who was very influential upon Lincoln convinced him easily to order the blockading of all Southern coasts and harbours. It is with this in mind that Seward readily accepted Ericsson's project, more for political reasons than because of enthusiasm for the inventor's vessel.

since the construction of the *Princeton* in 1841 and the accidental explosion of one of her guns. He nevertheless accepted the invitation. In front of an audience enlarged for the circumstance by numerous naval personalities, he brilliantly explained his project by going through numerous technical explanations that very few probably understood. His manner was so convincing that the board finally accepted, only Davis showing some form of reluctance before siding in with the others. Ericsson was rewarded with a 275,000 \$ contract. He immediately set off for New York to start the construction of his vessel since he was only awarded one hundred days to fulfil the dream of his life. Bushnell would bring the official papers the following week.

On September 16, 1861, the Department of the Navy confirmed the order for three vessels, the *Galena* and the *New Ironsides*, two rather traditional armoured vessels propelled by sail and steam, and Ericsson's machine. The final contract was signed on October 4, 1861. It specified that the ironclad should be delivered on January 12, 1862 and that payments would be settled in instalments according to the progress made. An odd clause was however added: the final settlement, 25 percent of total, would only be paid when the vessel had proven itself in combat! Although no such arrogant precedent ever existed in the annals of the Navy, Ericsson signed the contact with full confidence.

Who was John Ericsson, this genial inventor? He was born on July 31, 1803, at Langbanshytten in Sweden from a family running a mining business. As a child, he exhibited unusual talents for drawing, designing and constructing machinery. He attended no formal school until he and his brother Nils were appointed cadets in the Mechanical Corps of the Swedish army. At the age of seventeen, he entered the Swedish army with the rank of ensign. Securing a leave, he left for England with the intention of improving his education. There he made a connection with John Braithwaite, a machine manufacturer, and later became his partner. With the help of his new associate, Ericsson was granted some thirty patents for numerous inventions ranging from fire pumps and ventilators to condensers and steam machines of all kinds. In 1827, he was charged with desertion by the Swedish army on the grounds of excessive leave. The Swedish Crown Prince intervened to honourably restore him to service and even promote him to the rank of captain. Ericsson continued to work with all available energy to design and improve machines always more efficient, notably his famous locomotive, the "Novelty". This steam engine set off in a race sponsored by the Liverpool & Manchester Railways against George Stephenson's "Rocket", the steam machine of another great inventor. Ericsson's locomotive was the fastest, beating the current speed record of 67 miles per hour, but due to a mechanical failure, Stephenson was declared the winner of the race. In 1836, Ericsson was granted a patent for the screw propeller as a propulsion power for steamships. The British Navy would not adopt it until eight years later.

In the meantime, Ericsson, then aged 33, married Amelia Byam. By 1837 the Ericsson-Braithwaite Company was crumbling under debts and finally went broke. A reverse of fortune occurred when Ericsson met in London the rich Captain Robert F. Stockton from New Jersey who commissioned him to build a 72 feet long screw driven steamboat. Ericsson went to work at once and in May 1839, the *Robert Stockton* left its mooring berth for the United States with a crew of five men. In November 1839, Mr. and Mrs. Ericsson departed for New York. The purpose of the trip was for Ericsson to convince the Federal navy to adopt the screw propulsion. After endless meetings with the responsible officers of the Department of the Navy and the politicians of Washington, he was awarded the construction of the *Princeton*, a revolutionary warship powered by a six-blade propeller and provided with a telescopic funnel and other modern refinements. In

addition to a battery of 42 lbs. coronades, the ship was provided with two 12-inch guns, the most powerful ordnance pieces of the day. One of these was the "Peacemaker" designed by Captain Stockton while the other, the "Oregon", had been built to Ericsson's specifications. The *Princeton* was ready for trials on June 5, 1844. Many notables had been invited on board including President Tyler and members of his administration. During a firing demonstration along the Potomac, the "Peacemaker" blew up killing and wounding more than twenty people, of which the Secretary of the Navy and the Secretary of State. After an enquiry, Ericsson was blamed for the accident on account of false information from Stockton. His hopes of seeing the *Princeton* adopted by the navy vanished and he was never financially compensated for his efforts. In 1847, Ericsson was elected honorary member of the Science Academy of Stockholm and in 1848, he became a naturalised citizen of the United States. During this period, he was principally engaged in developing the caloric engine that utilises heated air for power and relies on the heat transfer principle. It was such an engine that equipped the *Ericsson*, built at a cost of 500,000 \$ raised from several sponsors. On a trial trip off Sandy Hook in 1854, the prototype ship foundered in a storm. It was later raised in a salvation operation for investigations. After this operation, Ericsson cut all further contact with the navy department.

As of October 9, 1861, the "Herald" newspaper reported that the *Merrimac* had been completely remodelled and that her launching was due shortly. Gideon Welles knew better than anyone else that the ironclad was still in dry dock and that the Tredegar Iron Works had not finished rolling her armour plates. The threat was however real, if not imminent, and the news impact on the morale of the population was indisputable. People already saw the iron monster sailing on the Potomac River towards Richmond. Worse, some navy commanders previously incredulous began to believe in the potential of this vessel. Officer Joe Smith (son of Commodore Joseph Smith) aboard the *Congress* at Hampton Roads informed Welles that if he was attacked by the *Merrimac*, he did not see how to defend his ship. Another letter, from Louis Malherbes Goldsborough of the *Minnesota*, reported that he actively continued the blockade of Hampton Roads, but that the appearance of the *Merrimac* would seriously jeopardise his position. Fear was gaining all levels of the population and ranks of the military. The iron monster was creating havoc before having left its dry dock!

At Hampton Roads precisely, Goldsborough aboard the *Minnesota* was involved in a humanitarian operation. Spies had informed him that the South was eager to recuperate a prisoner locked up in a New York prison, a certain lieutenant Sharpe. Remembering that the Confederate authorities detained Lieutenant John Lorimer Worden since the beginning of the war, Goldsborough proposed an exchange of the two men. The substitution took place on board the *Minnesota* and a free but exhausted Worden was sent home for a well-deserved convalescence. He reported back for duty on November 13, 1862, to Commodore Paulding, who commanded the Brooklyn Navy Yard.

Since Ericsson lacked the funds necessary to finance the construction of his ironclad, he set up partnership with Bushnell already busy with the *Galena*, and with John F. Winslow and John A. Griswold, two stockowners of the Renselaer Iron Works of Troy. This team would prove remarkably competent and efficient. Ericsson worked with unparalleled energy 18 hours a day, the morning on the drawing board and the afternoon visiting the works. On top of this, he was constantly pestered by letters from Commodore Smith, who consistently conveyed his doubts on the armament, the functioning of the turret, the stability of the vessel or the efficiency of the ventilation. Tired of having to

politely answer this boring correspondence, Ericsson suggested to the navy that it despatch an officer on the site to supervise the interests of the government in the construction of the ship. Commodore Smith gladly accepted and appointed Alban S. Stimers to the position. The latter, the previous chief mechanic on board the *Merrimac*, was a good, honest and competent technician. His first task was to put the engineer in chief in his place. Isherwood was continuously complaining on the deviations to the specifications and the slow progress of the construction. Stimer's competence and common sense soon proved the contrary.

Realising that the delivery date was approaching fast, Ericsson worked to the limits of his strength. It was now quite clear that he had embarked on an infernal race against the *Merrimac*. One could see him jumping from one yard to another, from the Continental Iron Works at Greenpoint, Brooklyn, where the hull and entire ship was being assembled, to the Delamater Iron Works on the Hudson River¹⁵, where the machinery and engine components were being manufactured. Tired and almost exhausted, he did not tolerate any inefficiency from his subordinates and rejected all last-minute deviation propositions. The date was November 13, which meant there was exactly one month left to finish the ironclad.

In the meantime, speculations on the *Merrimac* were winning a steady pace. The ninth of November issue of the famous "Scientific American" printed on its last page the sketch of the Confederate ironclad. It was an iron monster with a ten-gun casemate and a clean deck except for a smokestack and a pilothouse. She bore a formidable cast iron ram capable, according to the journal, of piercing anything afloat. The implications, even for the uninitiated in matters of naval warfare, were obvious!

Back in Washington, the prevailing mood was sombre. The year 1861 was waning and the New Year was looming with little reason for cheer. McClellan who had succeeded Mc Dowel after the Union defeat at Bull Run had organised a powerful, well-trained and equipped army of 170,000 men. This force assembled on Richmond's doorstep was however constantly drilling rather than showing any hostile gesture towards the South. The general was bound to inactivity; he moved with excessive precaution while failing to define any campaign strategy. His lack of action exasperated the public opinion to such an extent that Lincoln had ordered an inquiry into his conduct of the war. At the same time, the Lincoln Administration was shaken by a series of scandals involving the fraudulent purchasing of arms, horses and supplies by official agents, the conclusion of abusive military contracts at exorbitant prices and political corruption. The most corrupt of all was no doubt Simon Cameron, the Secretary of War. An inflamed press and public were demanding a cabinet reshuffle. Lincoln however stood firm and hoping to relieve the pressure by sacrificing a sheep or two to the wolves, he discretely disposed of Cameron by nominating him ambassador to the Tsar of Russia and replaced the vacancy by Edwin Stanton. The Administration had yet to face another scandal of financial nature. Mary Ann Todd, the President's wife, had decided to completely refurbish the White House and transform it "*into an abode worthy of America's chief executive*"¹⁶. The bills

¹⁵ The final assembly of the vessel took place in these two private works. However, Ericsson subcontracted for thousands of necessary components to numerous specialised casting mills, boiler makers and machine shops. The most important ones were the Novelty Iron Works, Holdane and Company, the Albany Iron Works of Troy, Clute Brothers Iron Works of Schenectady, New York's Niagara Steam Forge and Abott and Son of Baltimore.

¹⁶ Originating from a wealthy family in Lexington, Mary Ann Todd never felt at home in Washington. When she arrived at the White House in 1861, the "establishment", the core of which was Southern, remained unimpressed. Indeed, Washington had nothing but contempt for this woman of the South who had married a Yankee who was threatening to destroy their way of life. In refurbishing the White House, Mary Todd hoped to regain the esteem of the capital by

totalled 26,700 \$ at a time when most of the population had to tighten the belt!

To contain the widespread discontent and restore the credibility of the Administration, a military victory was desperately needed. Since Manassas some months before, no significant military feat had been able to boost the morale, except possibly the seizure of Fort Clark and Hatteras on the coast of North Carolina and Port Royal in South Carolina. The final blow came in October when the vanguard of McClellan's army was mowed down at Ball's Bluff. The first year of the war thus ended with little to show for the North while the lack of response to Bull Run constituted a terrible slap in the face of the Federal armies. The situation was somewhat brighter at the Department of the Navy where Welles had displayed a formidable energy. By December, the Federal fleet comprised 2,640 ships totalling 2,557 guns and 22,000 sailors. Mallory on the other hand had not remained idle either. The Confederate fleet now possessed 35 armoured ships of all classes, 21 of them steam powered. Forty additional vessels had been ordered through 32 contracts. Finally, the ironclad *Virginia* was about to be launched.

By January 1862, the time had come to appoint a commander for Ericsson's vessel. At Welles' request, Commodore Smith ran through a list of potential candidates only to retain one name, John Worden, a capable lieutenant with a long service record in the navy, who had recently been released from a Montgomery jail. The choice came as a surprise to Welles, but he nevertheless endorsed Smith's selection. Worden was thus appointed Captain of the *Monitor*, name chosen by Ericsson for his ironclad. Without wasting any time, Worden departed for the Continental Iron Works where he met Alban Stimers who introduced him to John Ericsson. The inventor, just like Welles, was not at all impressed by the navy officer. He would have preferred a much younger and more dynamic commander for his vessel, but pressed by the Department of the Navy, he had no other choice than to accept the proposed candidate. When Worden first examined the *Monitor*, he had mixed feelings about the strange ship. He praised the overall figure of the boat and the revolving turret with its two guns. He however expressed his doubts on the ship's manoeuvrability at sea. He wrote to Smith indicating that the vessel might prove a success but that in any event he was prepared "*to devote whatever capacity and energy I have on that object.*"¹⁷ On January 16, 1862, Ericsson received a letter from Smith informing him that the delivery of the vessel was now overdue. In his reply, Ericsson passed the blame onto the Administration, explaining that the labourers had been prevented from working overtime since there had been no money to pay them. By January 4, Ericsson had only been compensated with the modest sum of 37,500 \$ whereas 150,000 \$ were still in arrears! In the meantime, Worden had received permission to select his crew. According to orders, sailors originating from any ship docked in New York harbour were eligible. During several consecutive days, Worden conferred with the men of the *North Carolina* and with those of the frigate *Sabine*, formerly commanded by Adams at Pensacola. He adopted a quality approach in his selection and only the best men were accepted. As second in command, he chose Samuel Dana Greene. The chief mechanic would be Alban Stimers. Fifty-one officers and sailors would constitute the rest of the crew.

On January 29, Smith wrote once more to Ericsson to inform him that the *Virginia* had

demonstrating that the First Lady was a woman of exquisite taste and refinement, a happy union of Southern sensibility and cosmopolitan culture. She was strongly reprimanded by her husband for overspending her budget. The financial scandal was resolved to Lincoln's satisfaction when Congress buried an extra appropriation for the executive mansion in the budget for the coming year.

¹⁷ Mokin A., *Ironclad*, p. 215.

just been launched and was ready for trials. There was no need for such correspondence. The front page of the "New York Times" had already spelled out that the Confederate ironclad had left its dry dock and that the local folks thought she was capable of sinking the entire Federal fleet anchored at Hampton Roads. The next morning, at the very moment that the last iron plates were being fitted to the *Monitor's* hull, a curious crowd had gathered around the Continental Iron Works. At ten o'clock sharp, all ships in the harbour blasted their horns and whistles, and under a thunder of applause from the spectators, the ironclad cut loose its mooring ties and slipped gently into the East River. Standing on the deck, a triumphant Ericsson enjoyed the moment he had so long waited for. His delight contrasted sharply with the bewilderment of the public, reporters and navy representatives alike, since the vessel floated perfectly and moreover her draft was less than anticipated. After a fiery speech whereby, the inventor praised the qualities of his baby and proclaimed that the *Monitor* could easily sink the *Merrimac*, the vessel was tied to the dock, ready to receive her final touches.

Although not a day passed without additional rumours of the *Merrimac's* invincibility filtering through the media, Ericsson now informed Smith that the two guns had been installed in the turret and the machinery and ventilation system tested. On February 19, the *Monitor* made her first sortie into the Bay of New York. The trials would last three weeks. Except for a rudder failure and a few snags with the engine, the vessel behaved splendidly to Ericsson's entire satisfaction. After having taken aboard powder, shot and canister, food and other necessities, the *Monitor* was now ready for an official acceptance test. The general performance of the ship was found acceptable with a cruising speed of five knots, although a peak speed of six knots could be reached. The turret was rotated back and forth without any trouble. At Sandy Hook along the Potomac River, the portholes were opened to allow the firing of the two 11-inch Dahlgren guns¹⁸ to determine the possible concussion effects inside the turret. None were detected. The naval commission finally declared the trial conclusive. The *Monitor* was ready for active service!

Tuesday, March 6, was a clear day. At eleven o'clock, Worden gave the order to sail, and the *Monitor* slipped her moorings, destination Hampton Roads, at the mouth of the Chesapeake Bay. En route, the gunboats *Sachem* and *Currituck* joined the ironclad while the steam tug *Seth Low* took her in tow to speed up the journey. This maiden voyage could well have been the last. The *Monitor* suddenly hit a heavy storm and threatened to sink. Tons of water poured down below through the chimney, ventilation shafts and non-watertight seams of the deck. Consequently, the boilers were shut down and the engine stopped. Thanks to the continuous and heroic efforts of the seamen operating the bilge pumps, the boat was finally saved and by evening the engine was restarted. It was not before March 8 that the *Monitor* and her exhausted crew passed Fort Monroe and finally slipped into Hampton Roads near Norfolk. The bay was the meeting point of the James, Nansemond and Elizabeth Rivers with the Atlantic Ocean. Federal forces held its northern shores while the southern and western coasts were still in the hands of the Confederates. Worden moored the ironclad next to the *Roanoke* to report to Captain Marsten, commanding the Northern Atlantic blockade squadron in the absence of Commodore Goldsborough, who was on leave in the Carolinas.

¹⁸ Ericsson had originally foreseen that the *Monitor* would be provided with two "Oregon" 12-inch naval guns of his design that were already tested in 1844 on the *Princeton*. The Ordnance Department decided otherwise: the ironclad would be armed with two 11-inch Dahlgren guns, which both came from the *Dacotah*.

The *Virginia* was officially commissioned on February 17, 1862, but already her second in command, lieutenant Catesby R.A. Jones (the commander had not yet been appointed), expressed his discontent. The disputes between Brooke and Porter had generated errors in the calculation of the weight of the armour. The vessel lacked 200 tons to ensure an adequate cruising stability and her aft and fore decks, theoretically immersed under normal circumstances, now protruded above the water. The loading of coal and ammunition together with the provision of extra iron ballast on the hull managed somewhat to remedy this serious defect, but they reduced the draught of the vessel and the efficiency of her engine. Catesby R Jones had served on the *Merrimac* at a time when she was only a frigate. This reference coupled to the fact that he was considered one of the best ordnance officers in the American Navy constituted two factors, which should have appointed him as the vessel commander. He was duly assigned to the *Virginia* in 1861 but only as second in command. His responsibilities therefore included the armament of the ship, the provision of food, ammunition and coal as well as the recruitment of the crew. Since Brooke and Jones shared the highlight of all matters related to naval artillery, the first was put in charge of the testing of the guns that the second had selected for the *Virginia*. The battery originally foreseen to arm the ironclad consisted in six 9" smoothbore Dahlgren guns and four 7" rifled Brooke guns (designed by lieutenant Brooke himself). The precision of these naval pieces, carefully tested by Jones, convinced the Secretary of the Navy to reinforce the firepower of the *Virginia* by the provision of two addition 6.4" Brooke guns.

The construction of the prototype vessel had been a formidable achievement, but the recruitment of her crew did not prove a lesser challenge. Paradoxically the South could muster a sufficient number of navy officers but far too few sailors. On February 10, 1862, captain Franklin F. Buchanan, heading the James River Squadron, complained to his department of the lack of success of their recruitment bureau and of the impossibility of using sailors already incorporated in the land forces. After endless negotiations between the War and Navy Departments, Buchanan was finally authorised to draw 50 Mississippi sailors serving in a Louisiana regiment recently assigned to his district. These sailors, together with those recuperated from the confederate flotilla recently defeated at Pimlico Sound in North Carolina and some 45 additional marines, would constitute the crew of the *Virginia* (250 to 260 in total according to the vessel's surgeon).

No officer had yet been assigned to command the ironclad, in fact none would ever be. This omission of the Secretary of the Navy was intentional with the purpose of entrusting the command to one of his faithful veterans, Franklin Buchanan, mentioned above. Since his rank exceeded by far that of a unit commander, Mallory simply transferred him from an office of his department to the head of a Virginia Squadron, leaving him the freedom of selecting a ship not yet provided with a captain. As soon as he arrived in Norfolk, Buchanan ordered food, fuel and ammunition to be taken on board the *Virginia*. The army managed to delay the departure of the ironclad somewhat further by quibbling on the quantity of powder necessary for the mission. The squadron leader would only obtain his quota by March 7, 1862.

Buchanan, then 62 years old, had the reputation of a commander possessing an iron will and requiring exemplary performance from his men. He was abnormally impatient on this 8th of March since he detained confidential information: the *Monitor* was arriving full steam ahead to destroy the *Virginia* before she could leave her dry dock. The vessel presently resembled an anthill where hundreds of workers of all trade were busy applying the final touches. Just before 11 o'clock, while ignoring the protests of the shipyard's

manager, a boiling Buchanan directed all non-sailing personnel back to shore and ordered preparations to be made for an immediate departure. At 11 o'clock sharp, taking advantage of the rising tide, the *Merrimac* cast off her lines to slip gently into the Elizabeth River. En route the ironclad was escorted by the steamboat *Raleigh* and the steam tug *Beaufort* whose mission was to prevent any ramming attempts from the Union ironclad, especially in the rear where the propeller and rudder were most vulnerable due to the lack of armour. Upon approaching Sewell's Point, the ironclad and its crew were cheered by a crowd massed on the banks of the river and along the portion of the bay held by the Confederates. Buchanan then gathered his crew on deck to explain the purpose of his mission: no more manoeuvres he said, but, if possible, strike a big blow to the enemy as soon as possible. He addressed the men in these terms: "*Sailors, in a few minutes you will have a long-looked-for opportunity of showing your devotion to our cause. You are now to face the enemy. Remember that you strike for your country and your home. The Confederacy expects every man to do its duty. You may be sure I intend to do mine.*"¹⁹ When the chief mechanic reported to Buchanan that the boilers and engine were ready, the *Merrimac* steamed steadily north towards Hampton Roads.

Five miles upriver near Newport News, the Union fleet of Commodore Goldsborough lay at anchor. The *Congress*, a twenty-year-old frigate and the *Cumberland*, and old sloop of war, aligning respectfully 50 and 24 guns, were blockading the entrance of the James River. The rest of the squadron was strung to the east about 8 miles to the Chesapeake Bay and comprised an assortment of 18 wooden ships, of which the steam frigates *Roanoke*²⁰ and *Minnesota* (both sister ships of the ex-*Merrimac*) totalling 50 guns and the sail frigate *St Lawrence*. At about half past three, the attention of the fleet was stirred by the appearance of the three confederate gunboats, one of which was a huge, glistening black mass²¹. Since the bay was vast and the progression of the enemy very slow, the Federal had more than an hour to ready for combat. While shouting orders, the commanders could not refrain from thinking that despite daily warnings from Washington, the *Merrimac* had taken them all by surprise. Unfortunately, three key commanders were not at their posts: Commodore Goldsborough was on leave, Captain W. Radford commanding the *Cumberland* was on board the *Roanoke* and the commander of the *Congress* on mission ashore. To make matters worse, the *Congress* was severely lacking men so that soldiers of the 90th New York infantry had been temporarily assigned to the ship presently commanded by the second officer Joe Smith. The layout of the Union fleet was appalling: the ships were strung in shoal water and ungrouped. Their firepower was not concerted, leaving little room to manoeuvre.

The *Merrimac* was less than three-quarters of a mile away when the *Congress* opened fire, but to everybody's astonishment, the 32-pound shells crashed violently on the Confederate monster's casemate only to bounce back into the water! Spitting shells and canister through all her portholes, the *Virginia* steamed past the *Congress* under terrible broadsides to engage the *Cumberland* that Buchanan considered the most dangerous of all the blockading ships. A sudden return of shellfire from the *Merrimac*'s guns hit the *Congress* superstructures, sweeping her gun and spar decks and decimating her crew: the devastation on board the Union ship was beyond description. Remaining on its course,

¹⁹ Mokin A., *Ironclad* p. 237.

²⁰ The *Roanoke* could only depend on its sails, its main propeller shaft being broken six months ago. This abnormally lengthy breakdown did not cause undue concern to her commander. It illustrates how much the navy remained attached to sails, disregarding the advent of new technology.

²¹ The casemate of the *Merrimac* had been covered with a thick coat of grease. It was hoped that this would help in deflecting the enemy's cannon balls.

the Confederate ironclad went straight for the *Cumberland*, lying immediately ahead. “Do you surrender?” hailed Buchanan through a bullhorn. “Never, I’ll sink first” replied acting commander George Morris. Still steaming ahead, the ram of the *Merrimac* then suddenly pierced the *Cumberland*’s wooden hull, like a knife in soft cheese. At the same time, her bow gun fired at point blank range, opening a huge hole in the federal ship, large enough for an elephant to walk through! The retaliation was immediate: a deluge of steel fell on the *Virginia*, shattering her masts and lifeboats. A shell eventually hit her smokestack, creating a terrible shock wave that propagated through the confederate vessel, from deck to keel. “Sponge...Load...Fire!” marked the rhythm of the inferno as both vessels poured their murderous volleys into each other. The deck of the *Cumberland* was red with blood and littered with human debris. A well-aimed shot still managed to knock down two of the *Merrimac*’s guns, killing one man and wounding another. The *Cumberland* was now beginning to settle at the bow, dragging with her the confederate ironclad that was interlocked by her cast iron ram. Realising that both ships were about to go down together, the commander of the *Virginia* ordered full steam astern. In an ultimate and desperate effort, she managed to withdraw from her adversary while leaving behind her prong in the hull of the Union sloop. A few minutes later, the *Cumberland*, shot to pieces, sank in fifty feet of water. Most of her sailors had been killed or wounded. Of her 376-man crew, 121 were dead. In comparison, the losses of the *Merrimac* were light: two guns out of service and a few sailors killed and wounded, mostly from flying debris or wood splinters in the casemate.

In the meantime, commander James Tucker at the head of the James River Squadron, consisting of the wooden steamboats *Patrick Henry*, *Teaser* and *Jamestown* aligning together 15 guns of various calibre, had boldly forced the barrage of fire of the Federal shore batteries at Newport News. Reinforced by the arrival of this squadron, Buchanan made straight for the hapless *Congress*. Fearing a similar fate as the *Cumberland*, her captain ran up the mudflats of Newport News under the protection of its shore batteries. During this manoeuvre the *Patrick Henry* was hit by a direct shot into her boiler which exploded, killing four men. The *Merrimac* and her consorts then went into action and poured shell and shot into the *Congress* that was lying like a sitting duck, her fixed guns useless. A shell from the ironclad suddenly tore through the Federal ship’s berth deck, igniting the various powder reserves of her guns. The ensuing explosions left a trail of blood and mutilated bodies. At approximately 4.20 in the afternoon, Joe Smith was still organising the defence from the upper deck. His head was suddenly severed from his body from a shell fragment. Lieutenant Austin Pendergast, who was next in command, deemed the situation hopeless, and to avoid further bloodshed and loss of life, he hoisted the white flag. Buchanan immediately ordered a cease-fire and directed the *Beaufort* and *Raleigh* to go alongside the *Congress* to evacuate her crew and wounded. An unfortunate mistake with dramatic consequences then followed. As Pendergast was surrendering his sword to the captain of the *Beaufort*, and despite the white flag floating on the mast of the *Congress*, two Federal shore batteries recently deployed by the 22nd Indiana opened fire on the *Beaufort* and *Raleigh*, killing some officers and men. Buchanan, raging at this breach of military code, ordered that fire on the *Congress* be resumed with hot shot. While the crew was activating the shot furnaces, Buchanan climbed on deck armed with a musket. Shooting wildly at the shore troops, he was suddenly struck by a bullet in the groin. Severely wounded, his femoral artery severed, he was taken below where he handed command of the vessel over to Catesby Jones. The latter now gave the order for incendiary action. A hail of red-hot shots then landed on the *Congress* that was subsequently set ablaze like a torch. Of her 434-man crew, 240 lay dead. Among the

survivors was McKean Buchanan, brother of the *Virginia*'s commander.

Satisfied with her achievements so far, the Confederate flotilla decided to maintain the murderous course by attacking the remainder of the Federal squadron anchored a few miles away. Terrified by the invulnerability of the iron monster and the ease with which it had sunk the two other frigates, the *Minnesota*, *Roanoke* and *St. Lawrence* hastily retreated to Fort Monroe, but in the confusion, the *Minnesota* ran aground. Since the *Merrimac* had the same draft than her sister ship, she limited her approach of the enemy to approximately two miles. While the Confederate ironclad was delivering a few accurate broadsides to the Federal frigate, her pilots (they were civilians) realised that the tide was descending and therefore urged on drawing off in deeper waters. Since daylight was now fading fast, Jones decided to call it a day. The low tide had therefore saved the *Minnesota* from destruction and had ended the terror of her crew.

The *Merrimac* dropped anchor not far from the burning *Congress*. Below deck, the ship's surgeons were busy tending to Buchanan's wound. Since he was more seriously hurt than anticipated, it was decided to transfer him ashore where he could get better treatment. No rest was permitted for the crew. The men frantically worked by the light of torches to repair the ship's damage, notably the large hole created by the tearing off its iron ram. At the price of two men killed, five wounded, two guns destroyed and a few battered iron plates, the Confederate ironclad had sunk two enemy frigates and damaged a third while capturing 30 prisoners, killing more than 300 sailors and wounding an additional 100. The events of this memorable day, March 8, 1862, would no doubt induce every foreign naval power in revising their strategic and tactical thinking: only iron could compete with iron.

As mentioned earlier, The *Monitor* had arrived in the Bay of Hampton Roads on the same day the *Viginia* was indenting the Federal fleet. While commander Worden was boarding the *Roanoke*, Captain Marston re-read the telegram that had been transmitted 48 hours ago by the Secretary of the Navy, Gideon Welles: "*Direct Lieutenant Commanding John L. Worden of the Monitor, to proceed directly to Washington with his vessel.*"²² Marston, a respectable veteran with more than 49 years of active service, was confronted for the first time in his career with a critical dilemma: Welles' orders were unequivocal, but they had been given in the ignorance of the days' events. The *Monitor* remained the ultimate hope of the navy and in reality, constituted the last obstacle between the *Merrimac* and the Federal fleet. Sending the ironclad back to Washington would have been foolish. Marston then made the decision of his career: he requested that Worden report to Van Brunt, commander of the *Minnesota*. The latter, fearing an attack at first light ordered the *Monitor* to remain closely in a defensive position. "*If I cannot lighten my ship and float her*", said Van Brunt, "*I shall destroy her.*" "*I will stand by you to the last*" replied Worden. A violent explosion then interrupted the conversation between the two men: the powder magazine of the burning *Congress* had just blown up!

Dawn of March 9 at Hampton Roads was normally set to forecast a renewed Confederate victory. Stuck to its sandbank, the prey of the preceding day had little chances of escaping the destructive power of the enemy monster. The morning fog had barely lifted that the Federal lookouts announced the arrival of the *Merrimac* at Sewell Point, accompanied by the *Jamestown* and the *Patrick Henry*, whose boiler had been hastily repaired. At about 11.30 AM, thick smoke belching from her chimney, the *Virginia* rushed onto the only prey of the bay, since with the exception of a strange

²² Mokin, *Ironclad* p. 249.

looking craft moored next to the *Minnesota*, the area was void of Federal vessels. Already at 8 AM, the crew of the *Patrick Henry* had spotted a weird floating object “like a cheese box on a raft”, according to Jones, but not unduly alarmed, the latter paid little attention to it. The *Minnesota* opened fire first but with little success: her shots were direct hits on the greasy casemate of the *Merrimac*, but all were deflected in the water. The *Monitor* then suddenly swung into action, taking the crew of the *Virginia* totally by surprise. A first shot from one of the Confederate ironclad’s guns was aimed too high, and passing over the *Monitor*, its course ended on the *Minnesota*. Both Dahlgren guns of the *Monitor* then poured an accurate deluge of steel on the *Merrimac*, but with no apparent effect. The enemy’s response was immediate: well-aimed shots and shells landed on the *Monitor*’s turret, also with negligible consequence. The *Patrick Henry*, a powerful side-wheeler displacing 1400 tons, had in the meantime distanced herself from the combat area. If the issue of the duel was favourable to the South, she was to steam to Great Britain to announce a breach of the Federal blockade and the lifting of the embargo. Unfortunately, this was wishful thinking. Worden, exploiting his ironclad’s capability of veering eight times faster than his opponent, moved close to the *Virginia* to position himself in the dead angle of her fixed guns. The revolving turret had barely locked into position that its two 1600 lbs. guns opened a formidable fire on the enemy ironclad. To the disappointment of the 19 sailors manning the turret under the supervision of lieutenant Stodder, their projectiles, although fired nearly at point blank range, had the same effect as peas thrown at a rhinoceros. The *Virginia* then resorted to ram the flanks of the Federal vessel, but in vain. The *Monitor* proved easier to manoeuvre than his attacker and all charges were evaded with ease. At times both ironclads clashed with a terrible noise of creaking iron, but neither really felt the impact because of their massive construction. A strange ballet then developed only to be interrupted by point blank firing of the guns. The public, which had gathered on the banks of the bay, failed to understand and follow the logic of the fighting: finally, who was pursuing who?

Exasperated by the inefficiency of their respective actions, Catesby Jones and Lorimer Worden finally concluded that none of their guns could possibly damage their opponent. The *Virginia* then changed course, heading once more towards the *Minnesota* while firing a murderous salvo at close range. Since the previous day, the Federal frigate lay imprisoned in the sand. It was time to finish her off once and for all. Disaster then struck. Less than two miles from her prey, the *Merrimac* suddenly ran aground on a sandbank, remaining immobilised at the mercy of the enemy. A deluge of steel started to pour on her shell, fortunately the projectiles were constantly deflected. Jones tried everything to extricate his ship from the mud but to no avail. He then ordered the steam pressure to be increased even if it meant that the safety relief valves be locked in the closed position. After a quarter of an hour of desperate efforts, the sixteen boilers ready to burst and the engine panting under the torque of the propeller, the Confederate ironclad managed to free herself from the sand and to resume her course. In the meantime, Worden had anticipated the enemy’s intention. In a manoeuvre to intercept the *Virginia*, he attempted to ram her rudder but missed it by a few feet. At the same time, a bow gun of the *Merrimac*, under the command of lieutenant Wood, opened fire on the Yankee vessel hitting the pilothouse. Worden, temporarily blinded by the explosion, was immediately extracted from his post and taken to his cabin. With blood streaming from his powdered blackened face, he addressed the crew in the following terms: “*Gentlemen, I leave it to you. Do what you think best ... save the Minnesota if you can.*”²³ The command of the

²³ Mokin, *Ironclad*, p. 265.

ironclad fell to lieutenant Dana Greene whose first act was to examine the damage to the pilothouse. These proved minor and were temporally fixed. The *Monitor* was at that time caught in crossfire between the *Minnesota* and the *Merrimac*. Catesby Jones, thinking the *Monitor* was retreating and fearing the possibility of running aground once more, ordered his vessel to withdraw and to rally the safety of Sewell Point. Greene was now faced with a dilemma: whether or not to pursue the *Merrimac*. Remembering Worden's last orders to defend the *Minnesota* at all costs, he decided to play it safe despite the anger of the crew who was hot to finish the fight. The *Monitor* thus rallied the Federal fleet. The clash of titans was over, each Goliath claiming victory on the grounds that he remained master of the field.

Lieutenant Worden was transferred to the *Minnesota* where Henry Wise and Gustavus Fox, both having witnessed the naval battle from Fort Monroe, joined him. After a happy gathering, it was decided to send the commander of the *Monitor* back to his home in Connecticut, where he would recover under the good nursing care of his wife Olivia. As he departed, his crew assembled for a spontaneous tribute to the hero of the day. His ship had been struck twenty-two times, taking two shots to the pilothouse, nine to the turret and eight on her sides. With her two Dahlgren guns, the *Monitor* had fired forty-one shots under some five hours, twenty of them striking the *Merrimac* but doing little damage. The rebel ironclad was however in far from battle condition: her ram had been torn off, she was taking water in her engine room, two of her guns were out of service and most of her superstructures had been shot away.

While the news of Hampton Roads was propagating throughout the North like a trail of powder, a bitter Ericsson could not hide his disappointment. On one hand he blamed the crew of the *Monitor* for its lack of initiative and boldness, which had prevented the *Merrimac* from sitting at the bottom of the bay. On the other, he had no tender words for "Dahlgren and Company and those imbeciles at the Ordnance Department"²⁴. Ericsson nevertheless did not minimise the *Monitor's* achievement. A few years later, he wrote to his brother Nils: "*Ask those acquainted with the matter why England and France did not take part with the Southern states on April 1, 1862, as was intended, and they will answer you : Because the Monitor saved the American Navy from destruction the 9th of March. It was the cannons in the rotary turret at Hampton Roads that tore the fetters from millions of slaves, and afterward made the French abandon Napoleon's project in Mexico.*"²⁵

On Monday afternoon, day after the battle, President Lincoln was presiding over a jubilant cabinet meeting where the discussions centred on the events of the previous day at Hampton Roads. The cabinet, unaccustomed to celebrating military victories, was making the most of it. Each senator congratulated Gideon Welles and thanked him for his vision and perseverance. The Secretary of the Navy remained modest: the true heroes were those who had given their lives aboard the *Cumberland* and the *Congress*. Ericsson, Worden and the crew of the *Monitor* were all praised for their accomplishments. Despite the terrible loss of lives and ships, the cabinet saw the day as an unqualified victory for

²⁴ Ignoring Ericsson's protests, the Ordnance Department had issued a directive limiting the useful powder charge to 15 lbs., or half the normal charge for an 11-inch Dahlgren. The reason behind this was the possible concussion effect in the turret although all live tests had proven the contrary. During the clash at Hampton Roads, the gunners of the *Monitor* respected the order and fired the guns with half charges. Numerous ordnance specialists agree with Ericsson's statement that if the *Monitor's* guns had been loaded with normal charges, their shells would have pierced the armour of the *Merrimac* thus possibly changing the issue of the battle.

²⁵ Mokin, *Ironclad*, p. 266.

the Union. The rebel threat in the form of the *Merrimac* had been repulsed, the blockade remained intact, and the chances of European intervention had become improbable. It was only a matter of time before the South, squeezed like a lemon, would be forced into surrender.

The Southern camp was also rejoicing. Although no one had expected the sudden interference of the *Monitor*, the crusade of the *Merrimac* had nevertheless created havoc in the Union fleet and nearly managed to force the blockade. No doubt the *Monitor* had won a tactical victory, but the action of the *Merrimac* was none the less rewarded by a strategic success. Her sheer presence was to paralyse McLellan's invasion of Virginia by denying access of the Federal fleet to Hampton Roads and the James River. Mallory's predictions timidly addressed to the Confederate Congress a few months before were well founded! The Hampton Roads success would further encourage Mallory to persevere in his option: substitute quantity by quality, in one word breaking the enemy's backbone with a limited number of almost invulnerable vessels. The idea made its headway: in a four-year span, the Confederates launched no less than 29 ironclads from Southern arsenals, including prototypes of submarines!

A month later, on April 13, the *Virginia* at the head of a Confederate squadron, reappeared in the Roads and created havoc in the Union fleet. With the help of her consorts and without any apparent enemy reaction, she captured three frigates while constantly fearing the arrival of the *Monitor* at any time. But the Yankee ironclad failed to appear. According to a strategy devised by admiral Goldsborough, the *Monitor* was to keep a low profile and refrain from engaging the *Merrimac*, thereby leaving the Bay of Hampton Roads open to powerful Union steamers, such as the *Vanderbilt* and *Baltimore*, whose task was to sink the Confederate ironclad by ramming her at a predetermined angle. Unfortunately for Goldsborough, this chance never materialised. On May 6, a federal flotilla consisting of the *Monitor*, *Naugatuk* and *Galena* plus five additional wooden ships commenced a bombardment of the Confederate batteries at Sewell's Point. A few minutes later, a threatening *Merrimac* emerged from her hiding place at the head of a determined wolf pack. Somewhat terrified at the approach of the Rebel fleet, the entire US squadron, including the *Monitor*, hastily retreated to the safety of Fort Monroe. It was only a short matter of time before Joe Johnston's withdrawal from Virginia and McLellan's advance in the Peninsula would put an end to the Confederate Navy's supremacy in Virginia's waters and place Norfolk in an untenable defensive position. When the Federal took control of its arsenal during the next month, the *Virginia* was left without a home base. Since she could neither steam up the James River because of her excessive draft nor navigate the high seas in the event she forced the blockade of Hampton Roads, captain Josiah Tattnall, successor to Buchanan, decided to scuttle the ironclad rather than see it fall into the hands of the enemy. So, on May 11, 1862, sadly ended the career of the *Merrimac*: the rebel ram was propelled into the mouth of the Elizabeth River on Craney Island and put to the torch

The *Monitor* survived a little longer than her antagonist. During the entire summer she was assigned to reconnaissance duties and patrolled the James River until end of September 1862. On October 1st, the ironclad steamed back to the Washington Navy Yard where she was to be completely refitted to participate to the joint operations of the army and the navy against the Southern ports. The work, supervised by Ericsson and Isherwood, lasted a month. It consisted in an overhaul of the engine, the installation of a new telescopic smokestack, the provision of additional ventilators, the modification of

interior compartments and the fitting of antipersonnel armour plating around the turret. A new coat of paint was finally applied to the vessel so that the ironclad looked and smelt like new. The *Monitor* left Washington on November 17 for Hampton Roads. On December 29 at dawn, she was on her way from Norfolk to Charleston accompanied by the *Rhode Island*. Some twelve hours later, both vessels were caught in a violent storm off Cape Hatteras along the coast of South Carolina. Heavy waves crashed onto the *Monitor* and tons of water poured inside her through all possible openings, in quantities such that the bilge pumps became overworked and unable to cope for very long. Worst, the coalbunkers became flooded so that the boilers could no longer be properly fired. Consequently, the steam pressure dropped to some 20 psi causing the engine to finally stop. Since the vessel no longer responded and was on the verge of sinking, distress rockets were fired in the direction of the nearby *Rhode Island* which, due to her size and power, was in a better shape than her companion. The conditions on board the *Monitor* were now becoming unbearable, and the commander resorted to order her evacuation. The crew rushed to the lifeboats, but because very few were still intact, three trips to the *Rhode Island* and back were needed to evacuate the sailors and officers, of which lieutenant Samuel Dana Greene. As to the *Monitor*, she sank into the stormy waters around midnight, on the ice-cold night of December 30, 1862, taking with her four officers and twelve men

Further to the head wounds he received during the famous engagement of the *Monitor* on April 9, 1862, Worden lost the usage of one eye, but this did in no way affect his promotion in the navy. After a brilliant career, he retired in 1866 with the rank of admiral. As for John Ericsson, his inventive dynamism remained second to none. He went on building ironclads for the Federal army during the remainder of the war. Huge iron monsters provided with one, two and even three turrets shortly came out of the Union yards. Grouped in a specific class named after their predecessor, the "Monitors" were soon seen steaming on all rivers of the country, their presence no doubt contributing to ending the Civil War. After the conflict, John Ericsson remained heavily involved in the development of American technologies, specifically in the fields of ordnance, propulsion and solar energy. Until his death, the inventor would however remain bitter when questioned on the events of Hampton Roads. He died in New York on March 8, 1889, coincidence or fatality, exactly 27 years after the famous clash. At the request of the Swedish government, his body was repatriated to his native country where he was buried with all the honours normally reserved for a head of state.

The long-forgotten *Monitor* made the headlines of the newspapers in the seventies when divers accidentally discovered the wreck lying at a depth of 230 feet some fifteen miles off Cape Hatteras, along the coast of South Carolina. During her dive to the bottom of the ocean, the ironclad had turned upside down to bury itself in the sand, keel upwards. According to specialists, the turret weighing some 120 tons is in remarkably good condition, and the impacts of the *Merrimac*'s shots can still be seen. The remainder of the wreck is however in a decaying state, and it is estimated that within ten years, the ironclad will only resemble a mound of debris. On the site of the sinking, a one-mile zone around the ironclad's wreckage has been designated as a national maritime sanctuary under the supervision of the National Oceanic and Atmospheric Administration. Since 1973, numerous diving expeditions have visited the wreck. In 1977, the very first artefact was recovered: the *Monitor*'s navigation lantern. In 1983, it was the vessel's 1,500 pounds anchor that was retrieved. These artefacts and others are now on display at the Mariner's

Museum in Newport News, Virginia. An ambitious project to raise the turret has been put together. If it materialises, Ericsson's turret would be exhibited in a dedicated museum after a lengthy and complicated anti-corrosion treatment. There are however many obstacles to overcome. Diving conditions are extremely perilous because of the great depth of the wreck, and furthermore the site is constantly subject to underwater storms created by the meeting of the currents of Labrador and the Gulf Stream. To those technical difficulties must be added others of financial nature: some ten million of dollars or more will have to be made available for the project. Today, 25 years after the *Monitor's* discovery, an action plan is being formulated for proposal to the American Congress. Whether the plan is accepted or rejected may very well determine the fate of the *Monitor* once and for all!

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