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Adapted into English by Gerald Hawkins

FOREWARD

When one hears the word “submarine”, the Civil War enthusiast immediately thinks of the *Hunley* and the *Davids*, which are quite well-known today. However, when pushing research further, one suddenly discovers that the Confederates designed and built dozens of submarines and torpedo boats in many places throughout the South. I have tried in the following article to be as comprehensive as possible on this subject, which has fascinated me for several years, while taking into account the most recent findings in this field.

SOME PREDECESSORS

As early as 330 BC, at the time of Alexander the Great, one finds the first mention of a man residing under the sea, inside a diving bell.

In 1580, the English inventor William Bourne is the first to describe how to build a submarine that would actually work.

In 1623, the Dutchman Cornelius Drebbel, an inventor attached to the Court of St. James, built the first submersible in the world. He managed to dive about 15 feet into

the Thames River. The trial was made in the presence of King James I of England.

Thirty years later, the *Rotterdam Boat*, designed by the Frenchman Le Son, was built by Belgians. It was the first submersible to have been purposely made to sink enemy ships, in this case those of the English fleet.

In 1776, the American David Bushnell built the first American submarine, the *Turtle*, which attacked HMS *Eagle* of the British fleet in New York harbor during the War of Independence. It was commanded by sergeant Ezra Lee, but failed to puncture the hull of the enemy ship to attach its powder charge.

As early as 1797, Robert Fulton, an American inventor living in Paris, designed the *Nautilus* and completed its construction in 1800. He tried to sell it to Emperor Napoleon Bonaparte. He was given the rank of Rear Admiral and made a few unsuccessful attempts to attack the British fleet. The latter spotted his submersible and fled. Fulton also invented the first torpedo.

SUBMARINES OR TORPEDO BOATS?

First of all, one should explain the difference between these two terms, which are often mistaken one for the other:

The submarine (*Hunley* type): to be considered as such, the vessel must descend completely under water. It must be perfectly airtight and powered by a hand crank or an electric motor. The steam engine requiring a chimney for the evacuation of the combustion gases is obviously not suitable for a submarine.

The torpedo boat (*David* type): the major part of the vessel is submerged, but the chimney and a part of the casemate are always above the water level. In the South, they are always powered by a steam engine.

In April 1862, the CSS *Manassas* was used by the Confederates to defend New Orleans against Union Admiral David Farragut. This is not a submarine or a torpedo boat, but an ironclad. It was in fact the old tug *Enoch* built in 1855 in Boston, fully transformed and clad with metal plates, which possessed no torpedo fixed on a spar, but instead a 64-pounder Dahlgren gun replaced later by a 32-pounder smoothbore. A powerful ram was attached to the bow, designed to pierce the sides of enemy ships.

LITTLE INFORMATION AVAILABLE

Why is there so little information available on submarines and torpedo boats of the American Civil War?

The Confederate States had only limited industrial means and the North had declared the naval blockade of the Southern coasts. The Confederate navy was thus forced to exploit all opportunities to avoid the strangulation of its commercial trade with Europe.

As we shall see, many inventors deployed treasures of imagination to try to make life unbearable for the “damn Yankees” who were opposed to their independence!

Submarine warfare had a bad press at the time and was regarded as unrespectable for “gentlemen”. The Federal navy had declared in 1813 that it: “*deplored the use of mines and submarines, preferring the far more chivalrous method consisting of mowing down the crews of vessels, using shrapnel and canisters*”!

Many archives of the Confederate Secret Service were therefore destroyed voluntarily throughout the South to prevent them from falling into enemy hands as and when the Confederates lost ground.

Most of the official information about these experiments was kept in top secret files

moved to the Confederate capital. They disappeared in April 1865 during the fall of Richmond and the burning of the official buildings of the city at the end of the Civil War.

However, inventors of genius popped up throughout the country and local archives could still be discovered in the future. By browsing through letters and period newspapers, reports written by soldiers and civilians, collections of old photographs, war diaries, telegrams, factory archives and logbooks of Confederate navy ships, a handful of specialized historians have eventually gathered much information on the subject. The most famous specialist in this field today is undoubtedly Mark K. Ragan.

As we shall see, dozens of submersibles saw light in the ports and important Southern cities. Unfortunately, most of these submarines and torpedo boats have disappeared. It should be remembered that they were built 150 years ago!

STATE OF TENNESSEE (Memphis)

On June 10, 1861, reverend Franklin G. Smith published the following article in the *Tennessee Columbia Herald*, seeking the help of the people of the Southern States just a few months after the declaration of independence of the new Confederacy: *“Excepting our privateers the Confederate States have not a single ship at sea. Throughout our southern seaports, men of a mechanical turn and of the right spirit must go to work, maturing the best plans for the destruction or the capture of every blockading ship. From the Chesapeake to the mouth of the Rio Grande, our coast is better fitted for submarine warfare than any other in the world. I would have every hostile keel chased from our coast by submarine propellers. The new vessel must be cigar shaped for speed - made of plate iron, joined without external rivet heads, about thirty feet long, with a central section about 4 x 3 feet - driven by a spiral propeller. The new Aneroid barometer made for increased pressure, will enable the adventurer easily to decide his exact distance below the surface.”*

He concluded his article by saying: *“I am preparing a detailed memoir on Submarine Warfare, discussing matters not proper to be spoken of here, illustrated with engravings. Copies of the pamphlet will be sent to mayors of southern maritime cities.”* This article was also published in the columns of several newspapers in the South.

Reverend Franklin Smith was a famous chemist and respected inventor at the time. He had one of the best laboratories in the South. He apparently built at least one submarine with a propeller at the end of 1861, but it was sabotaged by a Union sympathizer and sank along the wharf of Memphis.

One can find in the annual report of the Commissioner of patents, 1862, kept in the archives of the Confederate Museum of Richmond, the reference: *Patent No. 61 - Invention: Underwater Battery - Inventor: F. Smith - Residence: Memphis, Tennessee - Date: January 8, 1862.*

Another of his submarines was apparently among those who were active in the port of Mobile, Alabama, according to his notes discovered after the war by members of his family.

STATE OF GEORGIA (Savannah)

At the end of 1861, two Irishmen, Charles G. Wilkinson and Charlie Carroll, undertook the construction of a submersible in Savannah, Georgia. The *Savannah Daily Morning* tells us that on February 23, 1862, Charles Wilkinson died during the first trial,

following the accidental rupture of one of the lifting chains of the crane that was putting the submarine at sea. Charlie Carroll survived miraculously and the newspaper promised to give further explanations on this ill-fated attempt in a forthcoming edition. Unfortunately, no further information was ever published on this subject!

Whatever, it was the first fatal accident during the commissioning of a submarine.

STATE OF LOUISIANA

The CSS *Pioneer I* (New Orleans)

The CSS *Pioneer* was built by James McClintock and Baxter Watson in March 1862. It was assembled at the Leeds Foundry or, according to McClintock, in his machine shop located 21 Front Levee Street where he already manufactured steam valves and even Minié bullets on a machine of his invention.

He successfully carried out a first trial in front a large crowd. The submarine pulled a mine attached to a 200 feet long cable, allowing it to be sufficiently far away when the powder charge exploded.

The Letter of Marque issued by the Confederate Government on April 1, 1862, describes it as follows: "*Said vessel was built at New Orleans in 1862, it has a propeller, is 34 feet long, 4 feet wide and 4 feet high. It weighs about 4 tons, has tapered circular ends and is painted black.*"

After the war, James McClintock gave the following description of the submersible: "*We built the first submarine in New Orleans in 1862. It was made of 1/4 inch thick iron plates. It had the shape of a cigar, 30 feet long and 4 feet in diameter.*" The propeller of the submarine was powered by a hand crankshaft; it was not designed for speed, but to move silently without being noticed by the enemy.

During the first trial, the submarine plunged under its target, and then resurfaced on the other side. The floating mine pulled by the cable struck it and exploded with success. It is reported that it sank at a barge, some rafts, and a small schooner, which served as targets during other tests needed to perfect McClintock's diving methods. His aim was to sink the Federal ships USS *New London* and USS *Calhoun* patrolling Lake Pontchartrain.

On April 25, 1862, less than a month after these tests, New Orleans was captured by Union Admiral David G. Farragut. To prevent the CSS *Pioneer* from falling into enemy hands, McClintock scuttled it in a canal near Lake Pontchartrain. He then fled with his assistant Baxter Watson and settled in the port of Mobile, Alabama, where they immediately began the construction of a new submersible.

Shortly after, the Federals found the CSS *Pioneer* and withdrew it from the water. A full report and a detailed plan of the submarine found near New Basin, between New Orleans and Lake Pontchartrain, were drafted by Union navy engineer William H. Shock and his assistant Alfred Colin, assisted by G.W. Baird, a young mechanic of the USS *Pensacola*. All this material was sent to the Federal Assistant Navy Secretary Gustavus Fox and has recently been found in the National Archives. We are therefore now in possession of the only detailed plan known of the CSS *Pioneer*, of which only oral descriptions previously existed.

The last time the CSS *Pioneer* was heard of was on February 15, 1868, in the morning edition of the New Orleans *Picayune*, which announced: "*A torpedo boat, which was built in the city or hereabouts during the war, and which is now lying on the banks of the New Canal, near Claiborne Street, is to be sold at public auction today, by*

the United States authorities, at 12 o'clock at the Canal street entrance of the Custom House. The boat in question, which is built of iron and weighs about two tons, was sunk in the Canal about the time of the occupation of the city by the Federal forces, in 1862. It was built as an experiment, and was never fully perfected, and is only valuable now for the machinery and iron which is in and about it."

In the evening edition of the same newspaper, one could read: "*The torpedo boat, of which we made mention this morning, was sold at public auction today at noon, for forty-three dollars. It cost, originally, twenty-six hundred.*"

This is the last that was ever heard of the CSS *Pioneer*. We must conclude that it was totally dismantled to retrieve its metal parts, but some other parts may have survived and could be in the hands of a private individual or collector. Who knows?

The submarine of Bayou Saint-John

On June 25, 1861, E. P. Doer, a citizen of Chicago, Illinois, sent a letter to the Department of the Navy in Washington. He explained having met in Buffalo, NY, where he was travelling, a native lady from New England, who was returning from the South, where she had been teaching for three years. She had lived north of New Orleans and had managed to make it to the Northern States. She told him that the Rebels were busy building an underwater infernal machine to destroy the USS *Brooklyn* or any other vessel blockading the mouth of the Mississippi. According to her description, the submarine was to be used as a projectile with a ram or tapered steel prow to pierce the hull of the ship and then blow it up. She also stated that it was built by experienced engineers. This letter was dated well before the first rumors of the construction of the CSS *Pioneer*. Therefore, it must be another submarine or possibly the ironclad CSS *Manassas*.

The presence of a spar at the end of which would have been placed an explosive charge, suggests that the mysterious submarine could be the one exhibited for many years under the arcades of the New Orleans Presbytery. The submersible was built with skills, the metal plates forming the shell were recuperated from old boilers and appear to have been riveted (with the same method used in the construction of the ironclad CSS *Manassas*), as evidenced in the sketches that have been preserved.

The submarine had a crew of only three men. Two were sitting on a wooden bench and turned the crankshaft that was connected to a gear box allowing the four-blade propeller to rotate much faster. The third man, the pilot, handled the depth panes and rudder, and guided the machine via a window in the small cylindrical turret. An outside pipe connection seems to indicate that the submersible had some sort of snorkel attached by a flexible tube to a floating device on the surface, allowing the flow of fresh air inside the cockpit.

The wreck of the submarine was found in 1878 during the dredging of Bayou Saint John, a little upstream from where it empties into Lake Pontchartrain. The dredger *Valentine* brought it back to the surface the following year, where it was abandoned on the bayou bank.

Stephen T. Forster reports the following anecdote that took place during the discovery of the *Big Fish* as it had been nicknamed by many of the citizens of New Orleans who had come to attend the operation. After successfully opening the vessel, the skeletons of three men were found inside. A visitor suddenly exclaimed: "*This explains everything, and say that for many years I believed that they were traitors*"! When asked to explain, he replied that he had invented the submarine and hired three men to use it to

blow Northern gunboats on Lake Pontchartrain. He was to guide his accomplices by way of signals from the bank. They sailed, but as they did not respond to his signal and never returned, he concluded that they were traitors who had changed sides and joined the Yankees.

In 1895, the wreck was transported to a Spanish Fort amusement park where it aroused some interest before being once more discarded. In 1908, at his request, it was given to the Camp Nicholls Home for Confederate Soldiers, which accommodated old veterans and needy soldiers of the ex-Confederate Army. It was placed on a concrete pedestal along the bayou near Esplanade Street and for a while became a local attraction.

In 1924, an 81-year-old former lieutenant of the 5th Louisiana Infantry, named Frances J. Wehner, confided to a reporter that he had participated in the construction of the submarine. He apparently told the truth since after examining the National Archives, it appears that he was duly enrolled in this regiment on May 10, 1861, in New Orleans, and that the 5th Louisiana infantry regiment remained in the vicinity of the city for several months. Unfortunately we know nothing more about this veteran.

The submarine in question was for a long time believed to be the *Pioneer*. However, it was measured in 1926 by William Morton Robinson as being 20 feet long, 3 feet 2 inches wide and 6 feet high. Remember that the real *Pioneer* was 30 feet long!

The submersible was acquired by the Louisiana State Museum in 1942 and placed in Jackson Square in New Orleans. It was moved to the Pontalba Building, then on 24 April 1957, it was installed under the Presbytery Arcade in front of the Louisiana State Museum (the old Cabildo), along Jackson Square, in the centre of the Old Quarter.

It was finally transported to Baton Rouge in December 1999 as part of a restoration project destined specifically to remove the cement that had been poured inside the wreck at the beginning of the past century and that was slowly corroding the hull. This delicate work is completed today and the perfectly restored submarine (even provided with a copy of the original propeller) is displayed at the Louisiana Museum of the Louisiana capital. To avoid once and for all any confusion with the *Pioneer*, it was officially renamed the *Bayou Saint John's Submarine*.

The infernal Confederate Machine (Houmas Plantation)

A Confederate infernal machine was exhibited for many years in the small private Civil War museum (belonging to an oil company) at the Tezcuco Plantation, near Burnside, Louisiana. On May 12, 2002, the Manor House and other buildings of the plantation were totally destroyed by fire. However, I had the opportunity to visit this plantation in July 2001 and took some shots of the submarine. Fortunately, although it had been abandoned for a few years, it was not too badly damaged. I took the necessary steps so that it could be entrusted to the remarkable Civil War Naval Museum of Columbus in Georgia, but to no avail. It finally was bought by the Museum of Houmas House Plantation, near Darrow, Louisiana, which quickly completed the restoration of the small submersible as shown on the photograph taken at this location in 2007.

A description that might concern this submarine can be found in the book of Simon Lake *The Submarine in War and Peace* published by J.B. Lippincott in Philadelphia in 1918, despite the fact that the author believed he was then speaking of the submarine of Bayou Saint John, which was still at Camp Nicholls at that time: "*It appears that this submarine was the conception of a wealthy planter who owned a number of slaves. He thought that it would add considerable interest to the occasion of her launching if, when*

the vessel left the ways, she should disappear beneath the waves and make a short run beneath the surface before coming up. So he took two of his most intelligent slaves and instructed them how to hold the tiller when the vessel slid down the ways, and in which way to turn the propeller for a time after she began to lose her launched speed. He told them when they got ready to come up they should push the tiller down and the vessel would come to the surface to be towed ashore. A great crowd assembled to see this novel launching. 'When things were all ready,' said the old Southern gentleman, 'sure enough, them two (slaves) got into the boat and shut down the hatches; and do you know, suh, that at that time them (slaves) was worth a thousand dollars apiece'. Well, it seems that the boat slid down the wads and disappeared under the water just as had been planned. The crowd waited expectantly, but the vessel did not reappear. Eventually they got into boats and put out hooks and grappling lines, but she could not be found. The designer of the craft stated as his opinion that 'he might have known better than to trust them pesky (slaves) anyway', and he was willing to bet that they had taken the opportunity to steal the vessel and run away. He asserted that very likely they would take the boat up North and give it to the Yankees, and that they could expect to hear of the Yanks using it to blow up some of their own (Confederate) ships. Her disappearance remained a mystery for a great many years - until long after the war closed, in fact, and the incident had been forgotten. Years afterward, during some dredging operations to deepen the harbor, the dredge buckets one day got hold of something they could not lift. A diver was sent down to investigate, and he reported that there was some metal object buried in the mud, which looked like a steam boiler. They set to work to raise this, and putting chains around it they lifted it on to the wharf. The old gentleman, in closing the narrative, remarked, 'And do you know, suh, when they opened the hatch them two blamed (slaves) was still in thar, but they warn't wuth a damned cent.'"

It is therefore clearly another machine than the one found in Bayou Saint John.

The submarine of Shreveport

In September 1863, the Singer Submarine Corps undertook the construction of five submarines in Shreveport, under the direction of engineer James Jones, who incidentally had also been one of the crew members of the *Hunley*.

The company settled in the Confederate shipyard located at the mouth of Cross Bayou, on the south shore, in the place where it empties into the Red River. Four submarines remained on the spot, but the fifth was sent to Houston, Texas, and its trace was permanently lost. When the Yankees demanded the surrender of the Confederate capital of Louisiana in June 1865¹, the submarines were sunk near the mouth of the bayou to avoid them from falling into enemy hands.

In 2005 and 2006, their likely location was discovered 30 feet deep under the shore of the bayou by Dr. Gary D. Joiner, an historian of Shreveport and Civil War specialist in Louisiana, assisted by Ralph Wilbanks, a sonar expert. I went to the site with Gary Joiner in 2007 and took a photograph of him. Both are now looking for permissions and the funds necessary to conduct the delicate and costly archaeological research, which should allow the exhumation of these four exceptional relics.

¹ In 1862, when Union forces took control of New Orleans and Baton Rouge, the State Government was transferred to Opelousas and then to Shreveport. In 1882, Baton Rouge became again the capital of Louisiana.

STATE OF TEXAS (Port Lavaca - Galveston)

The small village of La Vaca (known today as Port Lavaca), located on the coast of Texas, was extensively bombarded by the Union navy in the fall of 1862. This incident would have remained insignificant except that it triggered the wrath of one of its citizens: Edgar C. Singer. Owner of a small armory, he was originally from Ohio. He had previously worked with his uncle Isaac Merritt Singer (whose daughter married the younger brother of Confederate General Prince Camille de Polignac) at manufacturing the famous sewing machine.

Edgar Singer first began to experiment with naval mines with an amazing success. He quickly decided to start a small company to finance his inventions and appealed for funds to the members of the Masonic lodge to which he was affiliated when he arrived in Texas in 1840. In February 1863, he went to Richmond to offer his services to the Confederate Government.

A month later, Congress authorized the formation of the Singer Submarine Corps, conceding it 50 % of the value of any Northern equipment it would destroy, and guaranteeing the granting of patents for its inventions. Members of the group were quickly sent to Mobile, Wilmington, Charleston and Savannah.

Singer, whose unit had been renamed the Singer Secret Service Corps, met other free masons in Mobile, including Horace Hunley, James McClintock and Baxter Watson. Singer invested \$ 5,000 (or one third of the total cost) in the construction of what would become the famous *Hunley* submarine. They moved a few months later to the Yazoo River, in the State of Mississippi, and managed to sink the gunboat USS *Baron DeKalb*. Their success was such that Union Admiral David D. Porter ordered "*to shoot on sight members of this unit if they were captured.*"

Edgar Singer and his team were then sent to Shreveport, Louisiana, to build five submarines, then to Houston and Galveston, Texas, where they constructed two armored torpedo boats. On May 10, 1865, the same day when the Confederate Government was captured, one of these torpedo boats was ready for service. It was 140 feet long, armored with iron rails, floated low on the water and had the shape of a long rectangular box with square corners.

The last troops of the Trans-Mississippi Department having surrendered, Edgar Singer and his team, which had terrorized the Federal Navy for many years, simply returned to Lavaca to sign their surrender papers and thus were not troubled any further.

STATE OF VIRGINIA

The submarines of William Cheeney (Richmond)

Between the summer of 1861 and mid-1862, several submarines were built by the famous Tredegar Iron Works of Richmond, under the supervision of William Cheeney, a New Yorker by birth and former Federal navy officer who had settled in the Confederate capital. He was also responsible for the mooring of electric mines in the James River, designed to strengthen the defenses of the Southern capital against Northern attacks coming from the River.

According to the report sent to the famous Northern detective Allan Pinkerton by a certain Mrs. Baker, a Yankee spy, a successful trial took place at the end of 1861 on the James River, a little below Rocketts. It was a small underwater vessel with three men on board. The diver, or third crew member, left the ship using a scuba and, with the help of

a rubber suction cup, placed an explosive charge under the hull of a barge. The air was supplied to the diver through a hose connected to the submersible. A few minutes later, a huge explosion sounded and sent the barge to the bottom of the river.

A much larger submarine, also developed at the Tredegar Iron Works, was completed two weeks later, at the beginning of October, 1861. It was transported to Sewall's Point to launch an attack against the Federal fleet at Hampton Roads. Its target was the USS *Minnesota*. The attempt failed and the submersible, which became entangled in an anti-submarine net, narrowly escaped capture.

On May 13, 1862, Cheeney was still working on modifications to his prototype or the construction of a new model. He spent a few months in the Submarine Battery Service along the James River but deserted in September 1862 to join the Union navy. He then obviously communicated his research work to the Federal Government.

In April 1863, the Triton Company was founded in Richmond, Virginia, with the collaboration of the Singer Submarine Corps. The company embarked on the construction of a new submarine equipped with an outer compartment for the diver. This vessel could have been transported to Charleston and put into service.

The CSS *Squibb* (Newport News)

The small Confederate torpedo boat CSS *Squibb*, or *Infanta*, commanded by Lieutenant Hunter Davidson, CSN, was on patrol on the James River. In April 1864, in the Chesapeake Bay, he successfully managed to puncture the hull of the large steam frigate USS *Minnesota* and trigger the torpedo placed at the end of its spar. The explosion occurred too close to the surface and, despite the 53 pound powder charge, failed to cause serious damage to the enemy ship. Hunter Davidson was nonetheless promoted to the rank of Commander.

Other small torpedo boats were also used on the James River at the end of 1864 and we can mention at least three with certainty: the *Scorpion*, *Hornet* and *Wasp*.

STATE OF ALABAMA

The American Diver aka *Pioneer II* (Mobile)

The *American Diver* was built at Mobile, Alabama, in the mechanical workshop of Park and Lyons, located at the corner of Water and State Streets, by James McClintock, Baxter Watson and William Alexander of New Orleans. The latter was an engineer attached to the 21st Alabama Volunteers, like Lieutenant George E. Dixon of whom we will talk about later. Four members of the Singer Submarine Corps joined them as mentioned above.

The submarine was ready at the beginning of 1863. It also pulled a torpedo attached to a cable. The descriptions we have today regarding the *American Diver* are quite contradictory. Indeed, in a letter of 1868 to Commander Matthew Fontaine Maury of the old Confederate navy, McClintock described it as “being 36 feet long, 3 feet wide and 4 feet high, having a conical shape 12 feet on each side.” On the other hand, William Alexander said that it “was 25 feet long, tapered at each end, 5 feet wide and 6 feet high, its middle section being oblong”! However, both agree to say that it was to be fitted with an electric motor (“electromagnetic” according to the wording used at the time). Baxter Watson had even proposed to the Confederate Government to discreetly go to New York where he would buy a suitable electric motor for \$ 5,000. The money

was however never released. The *American Diver* was therefore probably the first submarine to be fully designed for electric propulsion!

It had a crew of five. Nevertheless, nothing would work as expected. Indeed, the battery and the electric motor of local design were too weak to move the submersible. Trials were then undertaken with a steam engine, but without success. It was finally converted to a submarine powered by a manual crankshaft.

Bulky and difficult to maneuver, it sank off the coast of Fort Morgan in mid-February 1863 without causing casualties. It lies today somewhere at the bottom of Mobile Bay, Alabama!

The Colonel E. H. Agaman (Mobile)

In early November 1862, Colonel E. H. Agaman, responsible for anchoring a mine in the bay to defend the port of Mobile, developed a rocket-powered or propelled torpedo. As with all secret weapons devised during the war, the documentation on this torpedo boat is sparse and even confusing.

It is known that Agaman also invented a torpedo boat powered by a rocket to launch his torpedo. He received the sum of \$ 20,000 from the Safety Committee of Mobile to fund the project. On April 15, 1863, powder destined to fuel the rocket was shipped to Augusta, Georgia. At the end of the month, the preparations were complete and the prototype ready to be launched as from July 1 ... then no further news!

The CSS *Saint Patrick* (Mobile)

Captain John P. Halligan designed a Confederate vessel ahead of its time: the CSS *St. Patrick* (Halligan, who had chosen to christen it with the name of the saint patron of Ireland probably originated from that country). This small semi-submersible torpedo boat, built privately in Selma, Alabama, was launched in June 1864. It had two propulsion modes. A steam engine allowed it to reach its target area while moving on the surface; it then plunged and was propelled underwater in the traditional way, using a manual crankshaft.

It was operated in Mobile Bay under the control of the Confederate army but commanded by naval officer Lieutenant John T. Walker. Indeed, tired of waiting, Commander Matthew F. Maury of the Confederate navy had demanded that the submarine be operated by a more energetic officer than its inventor who, day after day, kept postponing his attack on an enemy ship.

The attack on the northern side wheel steamer USS *Octorara* occurred on January 26, 1865. The torpedo misfired and the Federal ship was not damaged. The night watch officer of the Federal navy even tried to capture the submersible by grabbing its chimney but since nobody threw him a cable to secure it, he had to let it go. The CSS *St. Patrick* finally managed to escape and returned to its base at the port of Mobile.

The CSS *Captain Pierce* (Mobile)

On August 5, 1864, took place the most mysterious submarine attack of the war, when during the battle of Mobile Bay, the USS *Tecumseh* withdrew from the Federal column to accidentally enter the minefields that the Northerners had however properly located. The ship exploded so quickly that only a handful of its crew members survived. Curiously, not one of the other Confederate mines laid in the bay exploded. Indeed, their

firing mechanisms never managed to ignite the charges that became damp since the powder barrels had remained too long in the water. Did the USS *Tecumseh* encounter the only mine in the bay, whose powder was dry? This seems highly unlikely.

Shortly after the sinking of the *Tecumseh*, the Federals withdrew three Confederate sailors from the water. Their leader, Captain Albert Pierce, asserted that he had fixed a mine under a Union vessel, which he had been unable to identify. A moment later, the boilers of his submarine exploded, killing some members of the crew and wounding him in the legs. Albert Pierce believed that the ship that had saved him was the same he had attacked a while earlier and he therefore thought that the mine had not produced its effects. But instead, could he not have fixed his mine under the *Tecumseh*? It is also rumored that another vessel is lying on the sand next to the wreck of the USS *Tecumseh*. It could well be the CSS *Captain Price*!

Other submarines in Mobile

The Confederates stated that another 69 feet long submarine and three or four others built between 1863 and the first half of 1865, had been operational in Mobile Bay.

Various submersibles, such as an underwater infernal machine that reportedly attacked the USS *Minnesota* near Fort Monroe in October 1861, were described with supporting engravings by *Harper's Weekly* and the French magazine *Le Monde Illustré* in 1864. The Confederate submarines were in reality much cruder machines than the fancy vessels described by those newspapers.

STATE OF NORTH CAROLINA

According to the archives of the Tredegar Iron Works in Richmond, which were recently studied by American historians, a submarine was built in Wilmington, North Carolina, at the end of 1864.

STATE OF SOUTH CAROLINA

The CSS *Hunley*, or *Whitney Submarine Boat* or *Pioneer III* (Charleston)

Edgar E. Singer, the 37 year old Texan, financed a third submarine with the help of Horace L. Hunley, Gus Whitney and their group. Together they gathered \$ 15,000 to ensure its construction.

The new submarine was built in the workshop of Park & Lyons under the supervision of Alexander and James McClintock, joined by Lieutenant George E. Dixon. The vessel was first known under the name of Whitney Submarine Boat. Completed in July 1863, it was operated by a crew of nine men. In July 1863, in the presence of Admiral Buchanan, the submersible dived while pulling a mine with a cable and successfully simulated an attack on a coal barge in Mobile Bay, Alabama.

On 23 August, nothing had yet been attempted against the enemy and McClintock being considered too puny, the submarine was seized by the army and transferred to the Confederate navy. The submarine decided to attack the USS *New Ironsides*, but five members of the crew and its commander, Captain John Paine CSN, perished during the expedition ... because they had forgotten to close the hatch upon departure!

In less than two weeks, the submersible was pulled out of the water, refitted and provided with a new crew under the command of two new captains: Horace I. Hunley

and George E. Dixon. The submarine was renamed CSS *Hunley* in honor of the one who had invested the most money in the project.

During a simulated attack on the CSS *Indian Chief*, the submarine sank, drowning its entire crew including Captain Hunley who was in charge that day. When the submersible was lifted out of the water, it was found that Hunley had immersed the vessel too quickly and that the water tanks had overflowed in the cockpit.

General P.G.T. Beauregard who commanded the Confederate forces in Charleston, South Carolina, was determined to defend the city with tenacity and had considerably improved the harbor defenses. He also possessed an unusual insight regarding unconventional weapons such as torpedo boats, submarines and naval mines, unlike most of his peers who resented these kinds of inventions.

At the beginning of August, 1863, Baxter Watson and Gus Whitney met Beauregard in Charleston and convinced him of the importance of their submarine. In September, the *Hunley* was lifted on two railway cars that left Mobile for Charleston. Its new base of operations was now Battery Marshall on Sullivan's Island. Its bow was fitted with a 22-foot long spar to which was attached a torpedo. Thanks to the tireless efforts of Beauregard, the relations between the army and the navy failed to sour, at least with respect to the *Hunley* saga. It was at this time, on December 2, 1863, that artist Conrad Wise Chapman made a first pencil sketch of the submarine in a dry dock. Some time later, he painted his famous canvas based on this drawing.

During the night of February 17, 1864, the CSS *Hunley*, commanded by Lieutenant George Dixon, sank the USS *Housatonic*, a sloop-of-war of 12 guns, which had a crew of 160 men. The *Hunley* was however unable to return to Charleston and disappeared in the darkness of the night with its commander and eight crew members.

The wreck of the submarine, located with accuracy by Clive Cussler in the fall of 1995 at approximately 4 miles off the coast, was retrieved from the bay on August 8, 2000 and transported to the Warren Lasch Conservation Center in Charleston, South Carolina, where it is visible today.

Since then, the conservation work implying the careful removal of concretions covering the hull and preservation of many objects found inside the submersible are carried out relentlessly. The skeletons of the crew were found inside the crew compartment of the submarine and were buried with military honors at the Magnolia Cemetery in Charleston, on April 17, 2004. Thanks to new facial reconstruction techniques applied to the skulls, the identification of the nine men has been successfully conducted.

On January 12, 2012, the metal frame holding the *Hunley* in position has been removed and the submarine put upright, allowing one to admire its entirety for the first time. Sea salt has significantly corroded the wreck that must remain immersed for several years in a sodium hydroxide solution to permanently stabilize all the metal parts. Once the corrosion stabilized, the submarine will be put on display in a dedicated Charleston museum.

The first CSS *David* (Charleston)

This vessel was conceived and designed by Dr. St. Julian Ravenel and privately built by engineer David Chenoweth Ebaugh at Stoney Landing Plantation, on the Cooper River near Charleston. It was a steam torpedo boat, cigar-shaped (nicknamed *cigar boat*), which resembled a submarine, but was not intended to move under water. Because of its

small size (symbol of David against Goliath) or to honor an engineer who had presided over its construction, it was named CSS *David*.

On October 5, 1863, transferred to the Confederate navy, it made a daring trial against the large battleship USS *New Ironsides*. The latter was damaged, but managed to stay afloat. On the other hand, the *David* nearly sank, the water displaced by the explosion submerging the boat and flooding its steam engine. Its commander nevertheless managed to return the vessel in good condition to the port of Charleston.

In March 1864, this same *David* attacked the Federal gunboat USS *Memphis* and, on 18 April, the frigate USS *Wabash*. A remarkable painting by Conrad Wise Chapman depicts a similar *David* in Charleston in 1863.

Different vessels of the *David* type were captured in February 1865 when Charleston fell to the Federal army. The very first seems to have been one of the torpedo boats captured that month. A photograph shows one of these boats with a buggy and a house in the background, another shows on the bow of a *David* the mechanism used to attach the torpedo fixed to the spar (photograph on the right) and suggests damage to the hull in the center of the vessel. Another photograph taken at the end of the war at the US Naval Academy in Annapolis, Maryland, shows a *David* at the foot of Old Fort Severn.

The CSS *Midge* (Charleston)

This submarine was built in Charleston in 1864 and captured among other *David*s in February 1865. Nothing more is known of this vessel. The CSS *Midge* was first taken to the New York Navy Yard and then to Brooklyn, NY, where it was displayed at the foot of the Boxer Monument. In May 1877, it was sold and has unfortunately never been seen since.

The “*Long David*” (Charleston)

In 1864-65, a much larger version of the *David* torpedo boat was built in Charleston. It was about 160 feet long or about three times the size of the usual *David*s. This steam boat appears to have been intended to force the blockade, and its cargo could hold up to 250 or 300 bales of cotton. It was captured before completion during the fall of Charleston and was taken to Washington, D.C., where it was photographed stowed near some battleships in 1865-66, at the Washington Navy Yard.

A very interesting photograph shows another long *David* that may have been based on Winan's cigar boat design, being constructed at Old Santee Canal Park, Stoney Landing Plantation.

CONCLUSION

As we have seen, the ingenuity of the Confederate inventors had no limits and was exceptional at the time because, let us not forget that we are then in the middle of the 19th century! This inventive spirit was present not only in constructing submarines and torpedo boats, but in unexpected remote corners of the old Confederate States.

Opportunities for research of historical sources have considerably grown in recent years thanks to computerized data as well as the interest and awareness of the public for family and private archives that have remained abandoned since too many years. Collectors whose knowledge is constantly increasing and who are now becoming true historians also contribute to significantly aid researchers in their quest for new finds.

It is therefore conceivable that important discoveries concerning Confederate torpedo boats and submarines will still surface in the coming years, especially in the context of the events commemorating the 150th anniversary of the Civil War.

We wish them all good luck!

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