

# NAVAL AERONAUTICS IN THE CIVIL WAR: NAVAL-ASSOCIATED OPERATIONS OF OBSERVATION BALLOONS; Part 1

by Thomas G. Hilt

Naval aviation history in the United States does not begin with the Civil War, although it does mark the U.S. Navy's first association with aeronautics, a story that has yet to be told in full. The activities of military observation balloons in the war are well documented; less so are those naval-related operations by both Union and Confederate forces. The term "naval" is used in the broad sense, in that military balloons were employed on water-borne vessels for military purposes, these vessels being both civilian and military. During the war, observation balloons were operated by, and for the purposes of, the Union and Confederate armies. At times, circumstances dictated using steam tugs or barges as bases for balloon ascensions. On the Union side, the Army's Quartermaster Corps most often chartered these craft. Although balloons at sea largely supported Army operations, the Union Navy benefitted directly from aerial observations on at least two occasions, at Island No. 10 on the Mississippi River and on the James River in Virginia. Both events are of historical interest in that for the first time a navy combined aeronautical and naval activities to achieve specific operational goals. The Union Navy also modified and provided to the Army's Aeronautic Corps the world's first vessel specifically configured for aeronautical purposes, the balloon-barge *George Washington Parke Custis*. Possibly of more importance, the Navy built the mobile gas generators that allowed Union balloons to operate independently in the field and at sea.

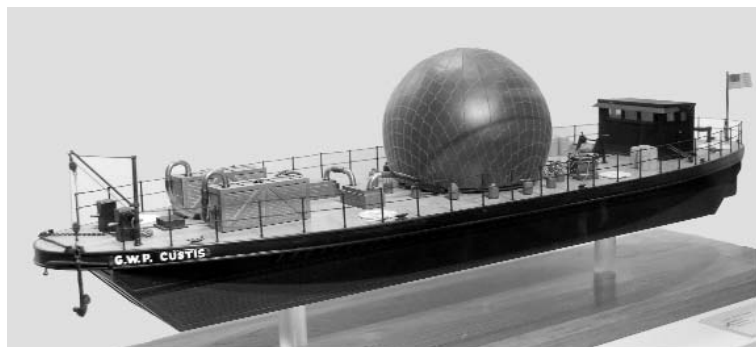
Balloon missions included gathering intelligence, making topographical maps, and spotting and directing artillery fire. Ships and barges extended their capabilities by providing mobile platforms to observe military operations adjacent to

rivers and bays. While comprising only a small percentage of balloon ascensions during the war, naval-associated flights can be documented on at least two-dozen occasions and across a surprising number of military campaigns and theaters. Operations occurred on the Mississippi River, at the sieges of Savannah and Charleston, on the Potomac River below Washington, D.C., and in Virginia on Hampton Roads and during Maj. Gen. George B. McClellan's Peninsular Campaign of 1862.

In general, all balloon ascensions from ships and barges were tethered, in that a rope or ropes firmly connected the balloon to the deck of the vessel below. Handheld telescopes or field glasses assisted the observers, although observations with the naked eye could be successful in clear weather. Communication between balloon and ship were by voice, if within earshot, or via written notes attached to a metal ring around the tether line, which guided them back to the vessel when released. While used occasionally by Union forces, there are no known instances of telegraphs being carried in balloons flying from ships, nor of signal flags or semaphore communications, at least by Northern aeronauts.<sup>1</sup> The Confederate balloon presence at Richmond, Virginia, in late June 1862 employed a signaling device that possibly could have been used when the balloon made several ascensions from a ship early the next month.<sup>2</sup>

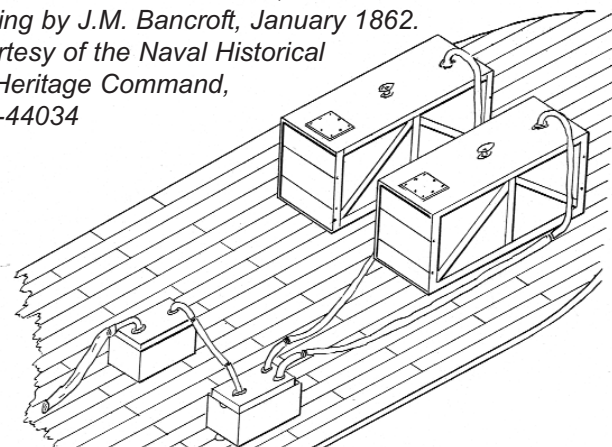
## Early Military Employment of Aeronautics

Concurrent with their first flights in France in 1783, balloons were considered to have military potential, demonstrated not long thereafter in the French Revolution. The French Republic, beset by foreign armies and willing to try any



A model of the G.W.P. Custis exhibiting the features known to exist on the vessel, including the gas generators on the bow, the balloon amidships, and the small cabin on the stern. (Author's photograph, courtesy of the Hampton Roads Naval Museum, Norfolk, Virginia)

*The gas-generation equipment situated on the bow of the G.W.P. Custis, from a drawing by J.M. Bancroft, January 1862. (Courtesy of the Naval Historical and Heritage Command, NHC-44034*



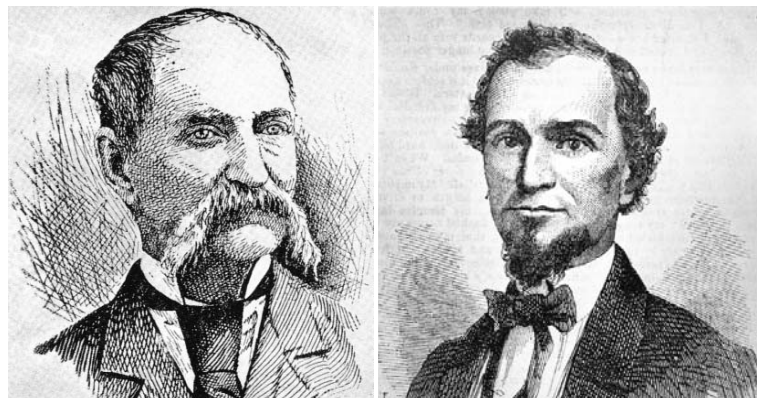
experiment to give them a military advantage, established a balloon corps in 1793. It included a dedicated military training establishment, experienced aeronauts and ground-handling crews, and logistics support. The corps seems to have enjoyed moderate success, dependent primarily on the willingness of commanders to trust and use the information obtained.<sup>3</sup> Acceptance of the technology by senior officers also proved to be a major factor driving the deployment of observation balloons in the Civil War.

The first recorded use of aeronautics at sea came in 1806. Thomas Lord Cochrane, commander of the British brig *HMS Pallas*, towed kites behind his ship to launch propaganda pamphlets off the French coast. The papers drifted inland, reportedly annoying the government of Napoleon.<sup>4</sup> The first offensive use of aeronautics from the ocean came during the Austrian siege of Venice in 1849. Austrian forces procured 100 hot-air balloons fitted with small bombs that had releasing fuses timed to drop them when the balloons drifted over the city. Prior to the assault, they experimented with a number of pilot balloons to chart existing air currents and time the flight of the balloons to the city. On July 12, the balloons were released, including an unknown number from the Austrian warship *Volcano*, located offshore of the Lido in the Gulf of Venice. Nature refused to cooperate, however, with several of the balloons apparently drifting back over the ship. In the end, no damage was done either to Venice or the *Volcano*.<sup>5</sup>

Americans also discussed the military potential for balloons at an early date. Benjamin Franklin wrote in 1784 about using an aerial fleet of balloons to transport soldiers in a hypothetical invasion.<sup>6</sup> Although balloons began appearing in the country in the late 1700s and flights were conducted with some frequency by the early 1800s, it would be another 45 years before a serious proposal for the military use of balloons was forthcoming. In 1840 the Secretary of War received a plan to use balloons in conjunction with the Seminole War in Florida, although he never acted upon it.<sup>7</sup> In 1846, the United States expedition to Mexico City planned to land at the city of Vera Cruz, the closest port to the Mexican capital. A heavily fortified castle on the seaward side of the city, however, impeded the invasion. John Wise, one of America's foremost balloonists, proposed using a large balloon to carry some 18,000 pounds of explosives to an altitude of 5,000 feet and drop them on the fortress. The balloon would be controlled by guy wires extending to a convenient point on land or to a vessel at sea. Wise floated his idea in a newspaper article, receiving much attention and discussion, but no further action. Ultimately the fort fell using conventional siege methods.<sup>8</sup> It was not until the Civil War that balloons would be used by the military in this country.

### Call to Duty: The Civil War Commences

When armed conflict broke-out between the Union and Confederacy over Fort Sumter in mid-April 1861, a number of prominent Northern balloonists responded to the call of duty, seeking military service as aeronauts. These included James Allen, a noted New England balloonist; John Wise, mentioned



**Left:** Losing to Lowe in an early competition to build a balloon for the Army, James Allen joined the Aeronautic Corps in March 1862. He made the last recorded balloon ascension from the G.W.P. Custis on July 30, 1862, and was the Corps' last Chief Aeronaut, in May-June 1863, following Lowe's resignation. (Courtesy of the Smithsonian Institution, NASM, SI 2009-4597) **Right:** John La Mountain, first to fly a military observation balloon from a ship at sea, August 3, 1861, at Hampton Roads, Virginia. (Courtesy of the Smithsonian Institution, NASM SI 90-6523)

above, a Pennsylvanian considered at the time America's preeminent aeronaut; Thaddeus Lowe, another New Englander who, the year before, had unsuccessfully attempted a transatlantic flight by balloon; and John La Mountain, a protégé of Wise from New York state. All were showmen; that is how they made their living in the years leading up to the Civil War. Not surprisingly, they all had over-powering egos, and in some cases, strong rivalries. For Lowe and La Mountain, the competition ultimately led to intense antagonism and an inability to cooperate for the common good.

By July 1861, Union forces under Maj. Gen. Irvin McDowell were planning a movement from their lines around Washington, D.C., to confront Maj. Gen. Pierre G.T. Beauregard's Confederate troops 25 miles west in the vicinity of Manassas, Virginia. This activity culminated in the Battle of Bull Run on July 21, a major Union defeat. In the weeks leading up to Bull Run and in the panic of the immediate aftermath, the Army called upon the aeronauts to demonstrate their balloons' capabilities in observing the whereabouts of Southern forces. Equipment problems, balloons that may not have been up to the rigors of military service and, in particular, poor handling by inexperienced ground crews all contributed to mediocre performances by Allen, Wise and Lowe. Army officers observing the operations of the balloons recommended against their further use or additional funding, ultimately causing Allen and Wise to leave for home, although Allen would return to military ballooning in early 1862.<sup>9</sup>

Lowe, however, refused to accept this decision. He was not looking just to sell his services; he had a vision of a complete "aeronautic corps," with himself as chief, which would accompany divisions throughout the Union Army and play an important role in the North's winning of the war. He also did not come to Washington without political backing,



having the ear of at least one of President Lincoln's cabinet members – and ultimately of Lincoln himself – along with the endorsement of Professor Joseph Henry, Secretary of the Smithsonian Institution. Henry acted as a trusted advisor to the Secretary of War on scientific matters. He also wholeheartedly supported the use of observation balloons as a technical advance for the military. Henry encouraged Lowe to demonstrate the use of the telegraph from a balloon in flight and carrying an engineer aloft to make a topographical map of Confederate positions opposite Washington, which the Army found to be useful. In the end, Lowe's political contacts and Henry's endorsement persuaded the War Department's staff to overlook the negative recommendation, and on August 2, the Army signed a contract for Lowe's services, including funds for a new balloon.<sup>10</sup> This represented the first step toward the establishment of an aeronautic corps.

Because of Lowe's prominence in the Civil War aeronautic service, it often is assumed that he was the first to operate a manned observation balloon from a ship, in part because Lowe claimed that honor for himself.<sup>11</sup> While Lowe adopted and expanded on the operation of balloons from vessels, he was not the first to fly from the sea. This honor goes to Lowe's chief rival and foremost antagonist, John La Mountain.

### **The Balloon Goes to Sea: La Mountain's Operations on Hampton Roads, August 1861**

John La Mountain was an aeronaut of some repute by April 1861, when the Confederates trained their guns on Fort Sumter. Although little is known about his early years, including his date of birth – presumed to be in 1830 – he seems to have been a merchant seaman before settling in Troy, New York. In 1858 he came to work for John Wise and assisted in constructing a balloon to cross the Atlantic Ocean. La Mountain gained early recognition as a crewman on the first trial flight of Wise's ship, the *Atlantic*, in July 1859, from St. Louis to upstate New York, an epic journey of over 800 miles. The trip ended badly, with

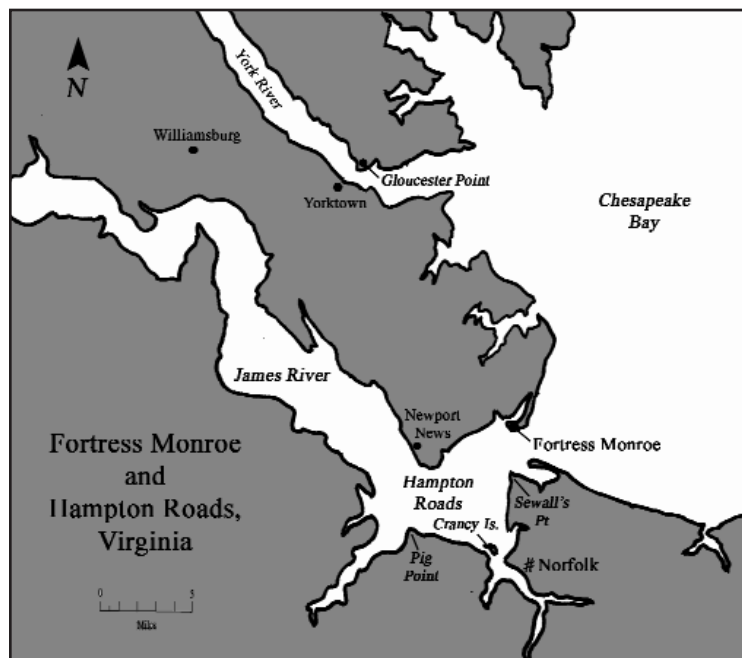
severe damage to the *Atlantic*, and also ended Wise's transoceanic quest. La Mountain took up the goal, but a second lengthy flight later that year, in which he and a companion barely survived a crash into dense woods during a storm, quickly finished his dreams of an Atlantic crossing. Sensational stories of his flight and survival, however, gained La Mountain additional publicity, and with the salvaged remains of the *Atlantic*, he continued to perform exhibition flights throughout New York and New England in the following years.<sup>12</sup>

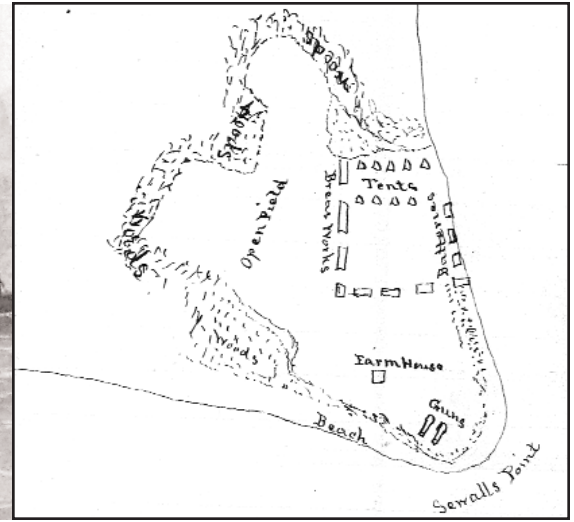
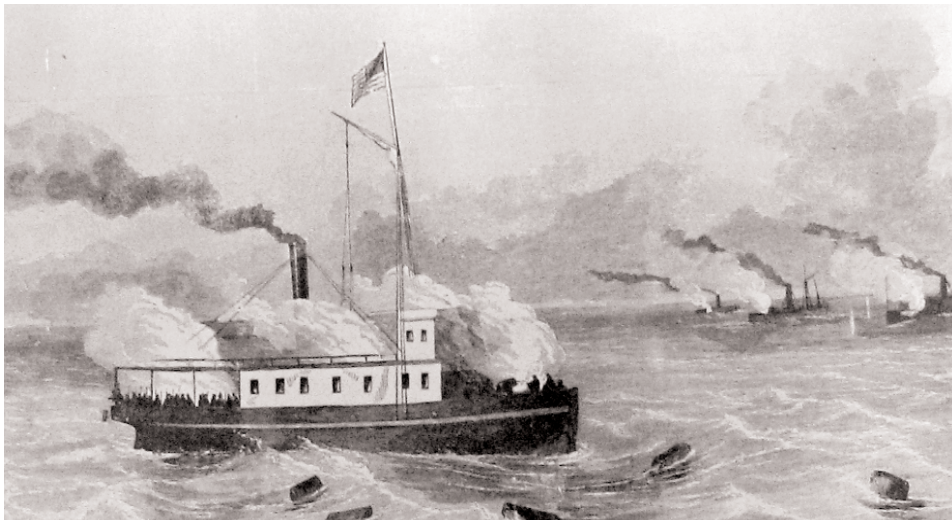
When the Civil War commenced in April 1861, La Mountain offered his services to the Union Army. After no answer from the Secretary of War, in late May he wrote to Maj. Gen. Benjamin F. Butler, commander of Fortress Monroe, a Union bastion situated at the end of a peninsula jutting into the waters of Hampton Roads and the Chesapeake Bay in southeastern Virginia. The aeronaut asked "to present to [Butler's] attention the subject of employing, in connection with the military movements, a competent aeronaut and to offer his services."<sup>13</sup> The U.S. Army's largest fortified installation on the east coast, Fortress Monroe remained in Union hands when Virginia seceded from the Union. Confederate forces under Brig. Gen. John Magruder confronted Butler to the north towards Yorktown, as well as on the western and southern shores of Hampton Roads. Fortress Monroe's sole line of communications ran east through the Chesapeake Bay. It relied entirely on the Union Navy for the means to stay alive. With only several thousand troops at his disposal and enemy forces strengthening, Butler urgently needed assistance in determining the number, location and activities of the battalions arrayed against him, and gladly accepted La Mountain's offer of aeronautical assistance.<sup>14</sup>

After some delay in readying his equipment, La Mountain shipped his balloon *Atlantic*, along with gas-generating apparatus, supplies, and two assistants to Fortress Monroe, arriving on July 23.<sup>15</sup> His first ascension came on July 25, but strong winds prevented the balloon from gaining altitude and hindered useful observation. Weather continued to keep the La Mountain grounded until the July 31, when he completed what is considered to be the first effective military use of an observation balloon in the Civil War. Rising to 1,400 feet on a



*Maj. Gen. Benjamin F. Butler, commander of Fortress Monroe, Virginia, and sponsor of La Mountain's flights from ships on Hampton Roads. (Courtesy of the Library of Congress, Butler Papers)*





**Left:** The steam-tug *Fanny* carried John La Mountain on the first manned balloon flight from a ship, on Hampton Roads in August 1861. Engraving is of the *Fanny* being captured by Confederate steamers on Pamlico Sound, N.C., in October 1861, from Frank Leslie's Illustrated Weekly Magazine, 1861. (Courtesy of the Naval Historical and Heritage Command, NH-59416) **Right:** Copy of the drawing La Mountain made of Sewall's Point for the report of his observations on August 10, 1861, including his flight from the tug *Adriatic*. The original is in the National Archives. (Courtesy of the Library of Congress, Butler Papers)

rope tether, he noted Confederate activity for a radius of more than 30 miles. New enemy encampments were seen on the far side of Hampton Roads, and most important, lack of activity northward toward Yorktown belied reports Butler received that Magruder's force opposing him had grown to 8,000 men. For Butler, La Mountain quickly proved to be of use.<sup>16</sup>

On August 3, La Mountain decided to take his balloon to sea. As a former seaman, use of a ship came as a natural solution to his need to obtain a closer view of the new Confederate construction on the far side of Hampton Roads. Loading his balloon onto the steam tug *Fanny*, he proceeded south into the roadstead for several miles and went aloft, the tether secured to a windless on the ship's fantail. The *Fanny* slowly steamed to a position opposite Sewall's Point – today the site of the U.S. Navy's largest base, the Norfolk Naval Station – where it stopped for a period of time. From an altitude of 2,000 feet, La Mountain saw the construction of additional gun positions on the point, including installation of two large-caliber field pieces. Due to a line of trees, this activity was not visible on his earlier ascensions from Fortress Monroe. He also noted that the heavy artillery, once installed, would be sighted directly at the fort and the Union fleet's anchorage nearby.<sup>17</sup>

After taking the observation at Sewall's Point, the *Fanny* turned to the southwest, slowing for La Mountain to observe Rebel positions near Craney Island and at Pig Point. The Confederate camps here, however, had not changed since La Mountain's land ascension two days earlier, so he had himself reeled back to the ship and returned to Fortress Monroe. A number of northern newspapers remarked that the method of ascension from the ship was "novel and entirely new" and claimed it to have been the "most satisfactory one which has been made at this date."<sup>18</sup> While the expedition obtained information of value, its historic importance lay in showing that manned balloons could be operated from a platform at sea.

Inclement weather then kept La Mountain grounded until the skies cleared on August 10. On that day he made two

ascensions to an altitude of 3,500 feet, one apparently from land near Fortress Monroe and the second during the evening from the steam tug *Adriatic*. General Butler, along with members of his staff, observed La Mountain's flight that night from on board the ship.<sup>19</sup> On this second voyage, La Mountain reversed his track of August 3, first heading southwest to inspect Newport News, then south toward Pig Point and on to Craney Island and Sewall's Point. He observed a large Confederate force five or six miles northwest of Fortress Monroe, but found little had changed at the batteries on the far shore of Hampton Roads. This last ascension of La Mountain's proved to be the first effective night observation flight during the war. Aerial reconnaissance at night provided a different perspective, and the fires of friendly and enemy encampments were clearly visible throughout the region. Lights in the tents also presented a useful gauge as to the number occupied and a means of approximating troop strength at various camps.<sup>20</sup> La Mountain's written report of his observations on August 10, including a drawing of the defenses at Sewall's Point, was endorsed by General Butler and forwarded to the War Department the following day.<sup>21</sup>

La Mountain's flight from the water on August 10 proved to be his last at Fortress Monroe. The balloon's gas was running low and the materials needed for generating more gas were now expended. General Butler appeared pleased with the effort, declaring La Mountain's work to be "very successful" and the information received "of great advantage," this sentiment being echoed by several newspapers. As he packed his equipment, La Mountain proposed to return with an even larger balloon for use at Fortress Monroe, one that could also shell or bomb Norfolk or other cities in the area.<sup>22</sup>

Now a believer in military ballooning, Butler readily recommended the plan to the War Department.<sup>23</sup> La Mountain left Fortress Monroe for New York on August 16, secure in the belief that his career would prosper. He also knew his reputation as an aeronaut with solid military ballooning



experience now eclipsed that of Thaddeus Lowe, his chief rival. Although Lowe by then was operating a balloon near Washington for the Army of the Potomac, the aeronaut had yet to distinguish himself in the air.

La Mountain's good fortune soon faded. He returned to Fortress Monroe in mid-September, to find General Butler had been ordered to Washington, replaced by Maj. Gen. John E. Wool. Having no knowledge of the aeronaut or his contract with Butler, Wool, in the best bureaucratic tradition, sent La Mountain back to Washington to "clarify" the situation. In a quirk of timing, the Secretary of War had just received a request for a balloonist from one of the Army of the Potomac's division commanders and La Mountain's unexpected arrival filled the position. For Lowe, the Army of the Potomac was his turf, and he did not greet his rival warmly. Maj. Gen. George B. McClellan, the army's commander and an enthusiastic supporter of using the balloons for reconnaissance, sensed the hostilities between the two and had them meet to hammer out a working relationship. Although they both agreed to work together when necessary, their cooperation did not last long.<sup>24</sup>

By late 1861 the two were feuding publicly, trading charges and counter-charges over the benefits of their respective operations, their character, and use of the Army's balloons. As the New Year rolled into February, the military hierarchy's tolerance of the infighting came to an end. One of the two had to go. Lowe retained more support within the

Army of the Potomac – by this time, McClellan had appointed Lowe to be chief of the Army's new Aeronautic Corps – and his competence in organizing the balloon corps was a tangible that Army officers could appreciate. On February 19, 1862, General McClellan issued the order dismissing La Mountain from military service.<sup>25</sup> Although his association with the Army was short, it was eventful. And, paradoxically, it would be with the U.S. Navy that La Mountain's legacy remains, as the first person to take manned flight to sea.

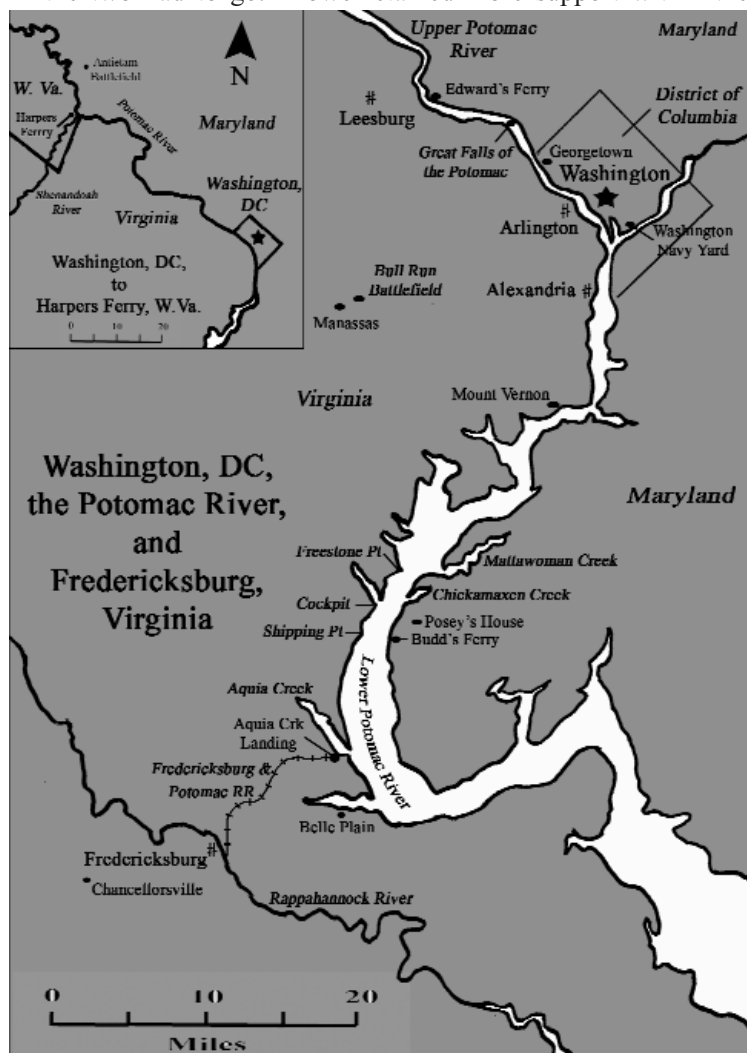
## Balloon Operations Along the Potomac River, November 1861 – March 1862

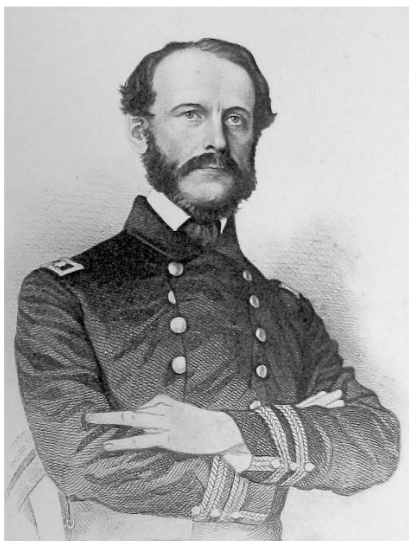
### The Army Establishes an Aeronautic Corps

Throughout his life, Thaddeus Sobieski Constantine Lowe continuously exhibited strong self-confidence, a sense of energy and vision, and a natural ability as a showman. Born in Coos County, New Hampshire, in August 1832, he showed a marked interest in science and the study of air currents and aerostatics as a boy, and in his late teenage years joined up with a traveling showman who interested Lowe in the study of chemistry. He also gained a strong interest in balloons and ballooning. After much preparation, he first flew in 1858 and by the next year began planning to fly the Atlantic Ocean. Although mounting a serious attempt to do so, the flight failed in September 1860. The venture did, however, provide Lowe with much-needed financial and professional contacts. The latter included Dr. Henry, the Smithsonian Institution's Secretary, who greatly assisted him in starting his service as a military aeronaut.<sup>26</sup>

As previously noted, Lowe gained a contract in early August 1861 to build and operate a single balloon for the military. His successful operation of the new balloon over the next several months made believers of a number of general officers in the Army of the Potomac, including their commander, General McClellan. With exposure, demand for Lowe's services from McClellan's division commanders increased, and on September 25, Lowe received authorization to build additional balloons, totaling six by year end. The deal also called for constructing a set of self-contained, portable gas generators for each balloon. In early October, McClellan designated him as the Chief Aeronaut for the Army of the Potomac. With his new balloons and title, Lowe's vision of an "Aeronautic Corps," with himself at the head, became a reality.<sup>27</sup>

The key to Lowe's concept of an aeronautic corps was the ability of his balloons to operate with the army in the field. The balloons and their associated apparatus had to be mobile. In this context, early on Lowe saw the need and potential for operating balloons from a ship. On July 29, 1861, five days before La Mountain first flew a balloon from the deck of the steamer *Fanny*, Lowe wrote that his proposed equipment, including balloons and gas generators, "can also be used on the rivers."<sup>28</sup> By October 21, as his Aeronautic Corps turned from paper into reality, Lowe expanded his idea of operating from afloat in a letter to Lt. Col. John N. Macomb, the Chief Topographical Engineer for the Army of the Potomac, at the





Comdr. John A. Dahlgren, Commandant of the Washington Navy Yard, was instrumental in the Yard's conversion of the coal barge G.W.P. Custis into a balloon barge and, more importantly, the manufacture of Lowe's portable gas generators. (Courtesy of the Naval Historical and Heritage Command, NH-43225)

Thaddeus S.C. Lowe, Chief Aeronaut of the Army of the Potomac and head of the Army's Aeronautics Corps from 1861 to 1863. (Courtesy of the Library of Congress, Lowe Papers)



time assigned to supervise Lowe's activities:

I should suppose that a balloon reconnaissance along the Potomac would be of service at this time. I therefore enclose a rough sketch of my plan for accomplishing that object, which is simply to take one or two large flat boats lashed together, and place one of the new gas generators upon them and take this raft in tow with a small tug; and whenever a reconnaissance is wanted it can be done from it as well as from the land.<sup>29</sup>

Lowe looked to the Navy for help in turning his concept into something tangible. Earlier that summer, with President Lincoln's assistance, Lowe secured a letter of introduction from Lt. Gen. Winfield Scott, then the senior general in the Army, to Comdr. John A. Dahlgren, Commandant of the Washington Navy Yard, for help in equipping the aeronautic service.<sup>30</sup> When they first met is not known, although they had done so by mid-October, when Lowe requested that the Navy Yard build his gas generators. At this time he also carried a letter from General McClellan permitting the aeronaut "to make such purchases as may be necessary for balloon purposes."<sup>31</sup> By all appearances, the commandant enthusiastically complied, and on October 17 authorized his

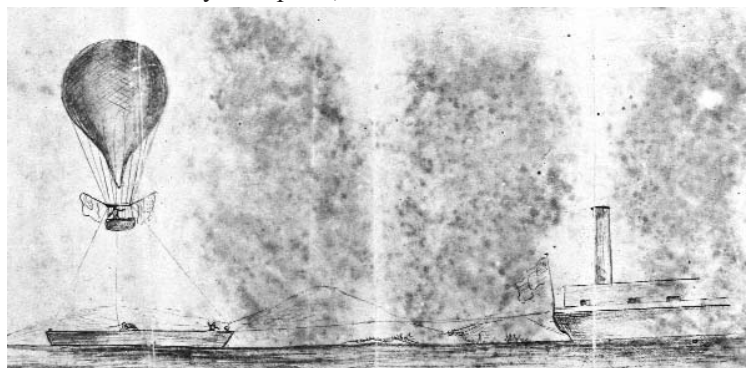
craftsmen to begin work on gas-generation tanks for Lowe's new corps.<sup>32</sup> Construction of the balloon barge would be the next move in enabling the Aeronautic Corps to operate from the water.

### **The First Aeronautic Vessel: The *George Washington Parke Custis*<sup>33</sup>**

George Washington Parke Custis, the grandson of Martha Custis Washington, George Washington's wife, was a noted Southern writer and playwright in the early nineteenth century. The ship named after him, a side-wheel steamer constructed in 1852 in Washington, D.C., plied the Potomac River trade for four years between the port of Georgetown, D.C., and Mount Vernon, George Washington's family home in Virginia, before being turned into a barge in 1856.<sup>34</sup> The Navy acquired it from an individual named John Fallon<sup>35</sup> in August 1861 for \$150, the thought being it "would be useful at the [Washington Navy] yard as a coal boat."<sup>36</sup> Dahlgren described the vessel being 122-feet long, with a beam of 14-1/2-feet, a 5-1/2-foot depth of hold, and able to hold 120 tons in deep water. While requiring "some bracing and caulking to make a coal barge of her, she is worth the money," he wrote, adding that "the planking outside is only 11 months old."<sup>37</sup>

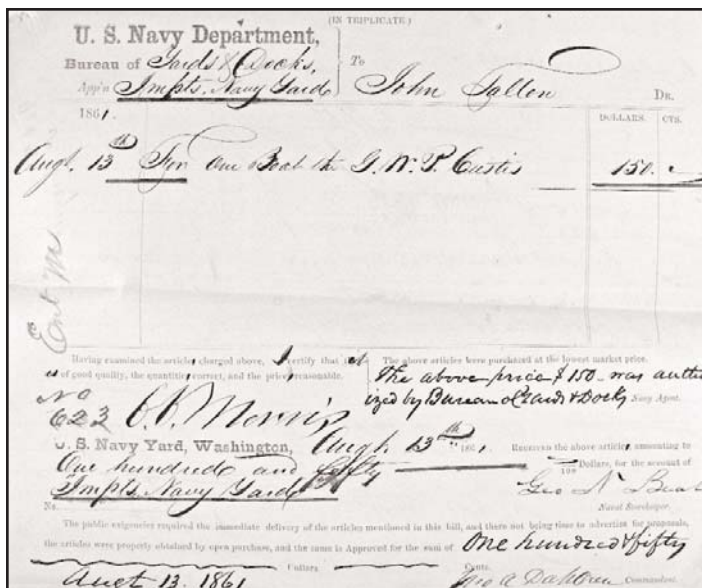
By mid-October the aeronaut had established a working relationship with Henry Forrest, the Navy Yard's Master Joiner, who was responsible for constructing Lowe's gas generators.<sup>38</sup> On November 6, Lowe accompanied Colonel Macomb on a trip to the Navy Yard to inspect the new apparatus, then nearing completion. During the course of the visit, they had a conversation with Dahlgren concerning Lowe's concept of a balloon barge. Dahlgren was amenable to the idea, asking only that Macomb secure the blessing of the Secretary of the Navy, Gideon Welles, in releasing a barge to the Army, which Macomb did in a letter later that day:

There is a lighter at the Yard which Commander Dahlgren told me he could spare if I would get the requisite authority to have it turned over to me. I have therefore respectfully to request that he may be



Lowe's sketch in a letter of October 21, 1861, illustrating his concept of a balloon-carrying barge towed behind a steamship. The dark blotches are discolorations in the paper. (Courtesy of the National Archives, RG-77)





Copy of the purchase order for the *G.W.P. Custis*, authorized and signed by Commander Dahlgren on August 13, 1861, for "immediate purchase of the articles mentioned above." (Author's photograph, courtesy of the National Archives, RG-71)

authorized to have such slight repairs made to the lighter as may be needed to keep it afloat, and a platform laid upon it in accordance with a sketch left with him, and that the lighter may then be turned over to me for the use of the balloon establishment of the Army of the Potomac.<sup>39</sup>

It is not known what prompted Commander Dahlgren to give up the *G.W.P. Custis*, which only three months earlier he had authorized to be purchased without bids due to "public exigencies." Although speculative, it is known that by late October officials at the Navy Yard were considering buying a number of canal boats, each of which could carry 200 tons of coal to assist in resupplying the Navy flotilla guarding the lower Potomac River. In response to Dahlgren's inquiry about their acquisition, Welles authorized him "to purchase as many of the canal boats as may be required."<sup>40</sup> In view of their greater capacity than the *G.W.P. Custis*'s 120 tons, at this time Dahlgren may have felt the latter to be expendable. In any event, the old barge was soon to embark on a new voyage.

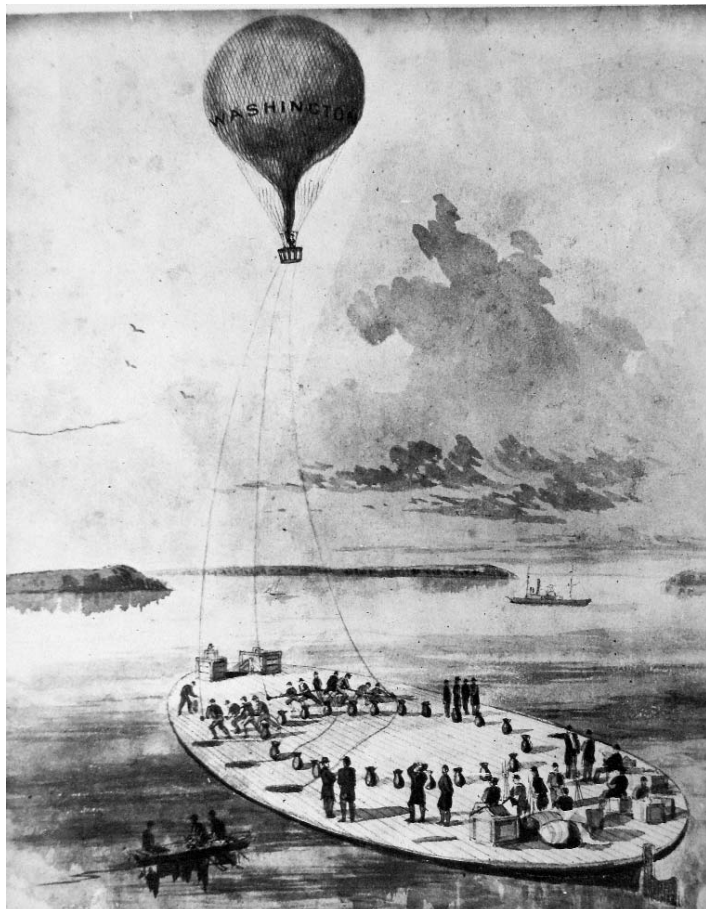
On November 7, Welles readily authorized the work on the barge requested by Macomb,<sup>41</sup> and Navy carpenters quickly began construction of a flat deck on top of the vessel, which hung out over either side of the *G.W.P. Custis*. The overhang was buttressed by "means of braces, like the New York ferry boats,"<sup>42</sup> which, if they were four-to-five feet in length, would have provided an open, flat space some 22 to 25 feet in width for handling the balloon and tethering it while in flight. The gas generators were situated on the bow, and later in November, at the request of Lowe, Henry Forrest added a small cabin on the aft end of the *G.W.P. Custis*. Furnished with a stove, bed, and table and chairs, this served as an office and

shelter for the aeronaut and assistants when on board.<sup>43</sup> There does not appear to be any plans of the *G.W.P. Custis*'s layout, other than Lowe's crude sketch for Macomb, a copy of which was given to Dahlgren.<sup>44</sup> What is amazing is that the main work was done in about three days, with the balloon barge beginning its first mission on Sunday, November 10.

While conversion of the *G.W.P. Custis* into the first aeronautic vessel later would be considered an historic occasion for the U.S. Navy, construction of the gas generators proved to be the Navy's greatest contribution to aeronautics in the Civil War. The generators allowed Lowe's dream of mobility to come true, cutting the Union balloons' tether to the city gas works and gas mains of Washington and Alexandria. Although heavy and cumbersome, they permitted the Aeronautic Corps to operate in the field and were ideal for working alongside the Army of the Potomac in its set-piece battles with the Confederate Army of Northern Virginia over the next year and a half. The idea of portable gas generators was not new. Both John Wise and John La Mountain had proposed them, but their designs were either effectively immobile or inefficient. Lowe was first to come up with an ingenious and efficient means that also would fit onto the bed of a standard army wagon or the deck of a small ship.<sup>45</sup> Lowe appealed to the Navy for assistance in constructing this apparatus because they "can be built by ship carpenters and coppersmiths now in the employ of the government in Washington" and could economize on costs.<sup>46</sup>

The gas generator installed on the bow of the *G.W.P. Custis* comprised four tanks: two large ones for generating hydrogen gas, and two smaller tanks, one filled with water to cool the gas and the other containing lime to dry and purify it before inflating the balloon. The gas-generation tanks were 11-feet long, five-feet high, and not quite four-feet wide, lined with lead and strongly braced. An 18-inch square trap door was set on top, secured with heavy wing nuts to keep it closed under the internal pressure.<sup>47</sup> Iron filings were dumped into the tank via the trap door and spread evenly on racks and shelves inside, with water then added to within two feet of the top. The chemical reaction began with the pouring of sulfuric acid into the tank through a lead-lined copper funnel, producing hydrogen gas and heat. Under pressure from the heat, the gas flowed via copper and rubber tubing through the cooler and purifier and then to the balloon, which was positioned in the center of the *G.W.P. Custis*'s broad deck.<sup>48</sup> Forrest started construction on October 17 or 18 and had the first set of gas generators ready for installation on the balloon barge by November 10, ultimately building a total of 12 sets by December.<sup>49</sup> Despite Forrest's cooperation, Lowe was not above complaining about the Navy's slowness in building the apparatus when he had not received more of them by mid-November.<sup>50</sup>

The overall cost of the work done by the Navy Yard for Lowe is not contained in the fragmentary records available, but the total appears to be at a minimum about \$6,000 to \$6,500. Three references have been found in bills presented by the Navy to the Army's Quartermaster General during this period, and likely there were more. The first, from October 23, 1861,



*The G.W.P. Custis, the first vessel specifically converted for aeronautic service by the U.S. Navy. This drawing reportedly was made in conjunction with the first ascension from the balloon barge, conducted by Thaddeus Lowe on the lower Potomac River in November 1861. (Courtesy of the Naval Historical and Heritage Command, NH-02079)*

is “for lumber and scantling to make Tanks for Professor Lowe,” although the costs are not listed.<sup>51</sup> The second reference, contained in a letter from Colonel Macomb to the Bureau of Topographical Engineers, mentions “\$5,636.40 for labor and materials ‘for the Balloon establishment of the Army, by order of the Navy Department, November 7, 1861.’ This I suppose to be the expenditure for portable gas tanks, which Mr. Lowe informed me he was getting made at the Navy Yard.”<sup>52</sup> Lowe earlier estimated the cost of the gas generators “ought not to exceed \$500,” although he did not state the number of units he thought could be built for that price.<sup>53</sup> While 12 sets undoubtedly cost more than \$500, they certainly should not have run to \$5,600, leading one to believe that the latter included costs related to conversion of the *G.W.P. Custis*. With work on the balloon barge beginning on November 7, it is reasonable to assume that Henry Forrest would have been able to approximate the cost of material and labor for inclusion with the requisition of that date. The last reference, on November 26, again containing no costs, relates to the painting of the 12 gas generators and provision of “1200-lbs pure white lead in oil and 10-gallons boiled linseed oil for immediate use.”<sup>54</sup> Construction of the gas generators and work on the balloon barge, however, did not end the Navy Yard’s relationship with

the Aeronautic Corps; over the next year-and-a-half, the Yard continued to provide support to Lowe and his organization.

The *G.W.P. Custis* proved to be an ideal vessel for supporting balloon operations because of its broad deck and roomy hold. The latter had plenty of volume for storing the bulky equipment of the Aeronautic Corps, particularly the ingredients needed to produce hydrogen gas. A barrel of iron filings weighed over 800 pounds, and four barrels were required for each inflation. The Washington Navy Yard was the source of most of these filings, at least while the balloon barge operated on the lower Potomac over the next five months. The sulfuric acid came in large glass vessels called carboys, each holding about 160 pounds of the liquid, 10 of which were needed to mix with the iron filings.<sup>55</sup> Given that the *G.W.P. Custis* is known to have carried as many as 40 barrels and 80 carboys in its hold at one time, the advantage of transporting large volumes of these supplies via water is apparent.<sup>56</sup> By November 10, 1861, Lowe gained use of the *G.W.P. Custis* on a permanent basis and ventured out to make his first balloon ascension from the vessel.<sup>57</sup>

### **Balloon Operations on the Lower Potomac River**

“I received orders from General McClellan to take observations along the shores of the Potomac, so my first expedition with the new equipment was by water.” With these words, Lowe opened Chapter Seven of his memoirs.<sup>58</sup> The event also opened up a new page in U.S. Navy history: the introduction of the balloon barge also introduced the Navy to aeronautics.

Due to the threat Confederate batteries in Virginia posed for shipping to and from Washington, the first balloon went to Brig. Gen. Joseph Hooker’s division on the lower Potomac River near Budd’s Ferry, Maryland. Early in November, the *New York Times* reported the arrival of Lowe’s newly constructed balloons in Washington, stating that the aeronaut would “leave with one on a steamer, which will be anchored in the river, while he makes his reconnaissance’s and watches for movements of the rebels on the Virginia Shore.”<sup>59</sup> On Sunday, November 10, the *G.W.P. Custis*, with the balloon *Constitution* aboard, left the Washington Navy Yard under tow by the steam tug *USS Coeur de Lion*. Aboard were Lowe, several assistant aeronauts, including William Paullin, who would be in charge of the balloon on the lower Potomac, a number of observers and newspaper reporters, and a detachment of 10 men from the Fourth Michigan Regiment to act as balloon handlers.<sup>60</sup> The contingent proceeded down the Potomac River to Mattawoman Creek, Md., about 25 miles south of the capital, where tug and barge anchored for the evening. Inflation of the balloon began late that night and into the morning, with preparations being made to observe the Confederate artillery batteries at Freestone Point, three miles west on the Virginia shore. In the morning, a storm appeared in the offing, so the barge was moved under the lee of a high bluff, with the bow touching the shore.<sup>61</sup> This site also concealed the *G.W.P. Custis* from view by observers on Freestone Point. The weather threat soon passed, enabling Lowe to make at least two ascents that day, and familiarizing



Paullin and other assistant aeronauts with the new balloon. The last flight came in the evening, carrying Brig. Gen. Daniel Sickles, one of Hooker's brigade commanders. According to Lowe, "we had a fine view of the Enemy's camp fires during the evening, and saw the Rebels constructing new batteries on Freestone Point." Newspaper accounts carried more details, claiming that a particularly clear night allowed seeing lights along roads for 10 or 12 miles to the west and estimating that up to 30,000 Confederate troops were bivouacked in the vicinity of the Potomac.<sup>62</sup>

The next day, November 12, Lowe made a round-trip to Washington to take care of some business. In the event, Paullin and the other assistants continued additional flights from the deck of the *G.W.P. Custis* at Mattawoman Creek. The *New York Herald* reported the "weather was mild and beautiful, the wind was lulled and an excellent opportunity afforded for observation. General Sickles made several ascensions and, with the assistance of an artist, took some sketches of the positions of the rebels."<sup>63</sup> Yet while Lowe was garnering praise in the press for his efforts, very possibly providing information "on background" from either himself or his assistants, General Hooker was not as favorably disposed. In a telegram to General McClellan's staff, he admitted "the balloon made several ascensions today, but so far removed from the enemy's works as to be of little or no service to us. It will be transferred to a point near Budd's Ferry tomorrow."<sup>64</sup> This was not the first time, nor would it be the last, that Lowe's perception of his services was at odds with those of the military he supported.

On November 13, Lowe made two ascents, at 6:00 and 11:00 a.m., with haze on the first and the second yielding good observations. The latter included sighting of the emplacement of a large artillery piece at the Shipping Point battery, some five miles.<sup>65</sup> Later in the afternoon, per General Hooker's instructions, the *G.W.P. Custis* was moved around the southern headland of Mattawoman Creek into Chicamaxon Creek, located to the south by about a mile. The Chicamaxon provided some concealment for the off-loading of the *Constitution*, which would not have been possible at Budd's Ferry, on the open shore of the Potomac about a mile below the creek. The balloon and gas generator were towed ashore and then a working party proceeded to clear trees and brush, ford streams, and breach fences to haul the equipment several miles to Posey's House, site of General Hooker's headquarters. Arriving around sundown, Paullin shortly thereafter launched the *Constitution* on another observation flight, resulting in "by far the best observation that has yet been made down the Potomac."<sup>66</sup> Once the balloon was offloaded, Lowe returned to Washington with the *Coeur de Lion* and *G.W.P. Custis*.

With the *Constitution* now flying from Posey's House, the *G.W.P. Custis* made occasional visits to the area, dropping off barrels of iron filings, carboys of sulfuric acid, and other supplies on the beach at Chicamaxon Creek.<sup>67</sup> The balloon barge also appears to have been kept at the creek for extended periods of time, possibly acting as an intermediate depot for aeronautical supplies and a gathering place for empty barrels and carboys. The first resupply run occurred late in the day on

November 25, when the *G.W.P. Custis* stopped at Chicamaxon Creek while en route to Fortress Monroe, carrying one of Lowe's aeronauts, John Starkweather, and a balloon for duty in South Carolina.<sup>68</sup> Soon into 1862, on January 17, the balloon barge again resided at Chicamaxon Creek, where it barely escaped damage from Confederate artillery fire aimed at a small schooner stuck at the mouth of the creek. According to Clovis Lowe, Thaddeus Lowe's father, who the aeronaut employed that month, shot fell "15 or 20 feet" from the vessel.<sup>69</sup> It was fired on again only about 10 days later, probably from the battery at Cockpit Point, while it was being towed to Budd's Ferry.<sup>70</sup> The next month, an inventory of aeronautic equipment provided by Lowe listed the barge being at "Chickamoxie [sic] Creek" on February 13.<sup>71</sup> The stay at Chicamaxon became extended on the February 24, when the barge's rudder was damaged in a storm, although no one apparently informed Lowe. On March 8, the Chief Aeronaut directed the *G.W.P. Custis* be towed to Washington, where the generator on board "is wanted immediately." A week later Lowe finally learned of the *G.W.P. Custis*'s immobility, as he urgently tried to send the balloon and gas generator at Budd's Ferry down to Fortress Monroe in response to the Confederate ironclad *CSS Virginia*'s devastating appearance at Hampton Roads.<sup>72</sup> Finally, on March 20, the barge's rudder was repaired, and four days later the tug *Rotary* towed it south to the fort, carrying much of the Aeronautic Corps's gear for the start of General McClellan's march to Richmond.<sup>73</sup> The *G.W.P. Custis*'s participation in McClellan's Peninsular Campaign will be explored subsequently.

It also appears that the *G.W.P. Custis*'s travels around the lower Potomac were not limited exclusively to trips between the Navy Yard and the Budd's Ferry area. As the New Year of 1862 opened, the balloon barge made at least one trip to Georgetown, on the Potomac in the western corner of the District of Columbia. According to a telegram from Lowe, around January 7 or 8, it was towed there to pickup equipment belonging to the Aeronautic Corps located at Fort Corcoran, across the river in Arlington.<sup>74</sup> Georgetown was the southern terminus of the Chesapeake and Ohio (C&O) Canal, which ran past Lowe's balloon station at Edwards Ferry, Md., on the upper Potomac. It is probable that Lowe used the *G.W.P. Custis* when necessary to transport heavy or bulky equipment and supplies to Georgetown. There they could be transferred to smaller canal boats on the C&O, which would move them to Edwards Ferry, bypassing both the waterfalls and rapids on the Potomac at Great Falls and the often-impassable roads during the winter months.

There is one other reported ascension of a balloon from a vessel on the lower Potomac, which probably occurred on the *G.W.P. Custis*. An article in 1896 by William A. Glassford, an Army balloonist and Signal Corps officer at that time, stated:

Aeronaut E. [Ebenezer] Locke Mason was in charge of a balloon ordered down the Potomac to Shipping Point, where the Confederates after First Bull Run had established a six-gun battery. The balloon was transported and

elevated from a small river steamer which had been altered for such use. During this trip the balloon and party narrowly escaped falling into the hands of the enemy and would have done so but for their prompt rescue by the Federal forces from the Maryland shore.<sup>75</sup>

Ebenezer Mason, hired by Lowe in Philadelphia in late 1861 to assist in construction of the new balloons for the Aeronautic Corps, accompanied the last of these to Washington in early January 1862. If, indeed, he took part in such an operation, it had to occur in either January or February, prior to the *G.W.P. Custis* damaging its rudder on February 24. In researching his article, Glassford corresponded with Mason, who would have been the source of this information, although the article contained no references or citations.<sup>76</sup> Otherwise, there is no mention of this incident in any of Lowe's writings or papers, the *Official Records*, or contemporary newspapers.

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[Editor's Note: Due to the extensive number of footnotes in this article, an editorial decision has been made not to reproduce them here. The complete footnotes for the article are available on-line at the AAHS Web site ([www.aahs-online.org](http://www.aahs-online.org)), or by requesting them from the Society.]

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### About the Author

The son of a Naval officer, Thomas G. Hilt spent his years through high school traveling up and down the West Coast, along with one-side trip to Hawaii. At age 11, living in a house overlooking NAS Seattle, he became captivated with Naval Aviation just as his eye sight began to deteriorate. Unable to enter naval flight programs upon graduation from college in 1969, Tom joined the Navy's Air Intelligence Officer program, gaining his commission from the Aviation Officer Candidate School at NAS Pensacola in October 1969. His first fleet assignment was with Fighter Squadron 151 on the *USS Midway* (CVA-41), from 1970-1973, followed by shore duty with the First Marine Aircraft Wing at MCAS Iwakuni, Japan, 1973-1976.



Released from Active Duty in 1976, Tom attended graduate school in California while remaining active in the Naval Reserves. He retired as a Captain, USNR, in 1999, and from the Federal Government in 2008 with over 38 years of total service in the Intelligence Community. He resides in Washington, D.C., with his wife and three somnolent cats, which affords him ample time to pursue his interest and research into the early years of Naval Aviation. This is Tom's first article for the *AAHS Journal*.

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# Notes for NAVAL AERONAUTICS IN THE CIVIL WAR: NAVAL-ASSOCIATED OPERATIONS OF OBSERVATION BALLOONS, Part 1

by Thomas G. Hilt

- <sup>1</sup> Haydon, F. Stansbury, *Military Ballooning during the Civil War*, Baltimore, Johns Hopkins University Press, 2000, pp. 174 and 323-326. This book was originally published as *Aeronautics in the Union and Confederate Armies, with a Survey of Military Aeronautics prior to 1861, Volume I*, The Johns Hopkins Press, 1941; Haydon never published Volume II. *Military Ballooning* is the definitive work on Civil War observation balloons and its copious footnotes were of immense assistance to this author in finding primary-source information.
- <sup>2</sup> Gallagher, Gary W., editor, *Fighting for the Confederacy—The Personal Recollections of General Edward Porter Alexander*, Chapel Hill, The University of North Carolina Press, 1989, p. 116.
- <sup>3</sup> Haydon, *Military Ballooning*, pp. 1-2 and 5-15.
- <sup>4</sup> Ibid., p. 19.
- <sup>5</sup> Ibid., pp. 17-18; R.D. Layman, *Before the Aircraft Carrier: The Development of Aviation Vessels 1849-1922*, Annapolis, MD, Naval Institute Press, 1989, p. 13.
- <sup>6</sup> Haydon, *Military Ballooning*, pp. 4 and 24; Richard P. Hallion, *Taking Flight: Inventing the Aerial Age from Antiquity through the First World War*, Oxford, UK, Oxford University Press, 2003, p. 61.
- <sup>7</sup> Ibid., pp. 66-67; Haydon, *Military Ballooning*, pp. 23-24.
- <sup>8</sup> Ibid., pp. 24-32.
- <sup>9</sup> Haydon, *Military Ballooning*, Chapters 2 and 3, pp. 39-81.
- <sup>10</sup> Ibid., pp. 169-198.
- <sup>11</sup> Thaddeus S.C. Lowe to LtCol A.V. Colburn, Assistant Adjutant General, Army of Potomac, November 12, 1861, War Department, BGen Fred C. Ainsworth and Joseph W. Kirkley, editors, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (hereafter referred to as *O.R.*; unless otherwise noted, references to volumes in the *O.R.* will be from Series 1), Washington, DC, Government Printing Office (GPO), 1880, Series 3, Volume 3, pp. 265-266. In describing his flight from a vessel on the November 11, Lowe wrote: "I have the pleasure of reporting the complete success of the first balloon expedition by water, ever attempted," ignoring the fact that John La Mountain had already accomplished the feat some three months before. It is hard to believe this was written out of ignorance; according to Haydon, *Military Ballooning*, pp. 136-138, Lowe appeared to keep himself well informed of the activities of his rival.
- <sup>12</sup> Haydon, *Military Ballooning*, p. 82-83.
- <sup>13</sup> Ibid., pp. 83-86; John La Mountain to Maj.Gen. Benjamin F. Butler, May 28, 1861, in the Papers of Benjamin F. Butler, Manuscript Division, Library of Congress, Box 5, General Correspondence. Why La Mountain singled out General Butler specifically to make this offer is unknown. Possibly it was on the advice of Oscar A. Gager, a prominent citizen of Bennington, Vermont, and mutual friend of both men. Gager accompanied Wise and La Mountain on the long-distance flight from St. Louis and knew the aeronaut's abilities well, along with those of his balloon. He also undoubtedly knew of his friend Butler's precarious position at Fortress Monroe when the general was assigned there in May. Gager visited Butler in mid June and probably encouraged him to use La Mountain's services when the aeronaut arrived at the fort. In addition, Gager provided the finances needed to move La Mountain's aeronautical equipment from New York to Fortress Monroe in July of 1861 (see Oscar A. Gager to Butler, June 22, 1861, Butler Papers).
- <sup>14</sup> John La Mountain to Butler, June 10, 1861, in Benjamin F. Butler, *Private and Official Correspondence of Gen. Benjamin F. Butler During the Period of the Civil War, Volume I, April 1860 – June 1862*, Norwood, MA, Privately Issued, 1917, p. 132; Haydon, *Military Ballooning*, pp. 90-92.
- <sup>15</sup> Ibid., pp. 87-90; La Mountain to Butler, 10 June 1861, *Private and Official Correspondence*, p. 132. La Mountain's letter stated that he would bring two balloons to Fortress Monroe, although there is no evidence that he flew more than one, the *Atlantic*. Contemporary newspaper articles do not mention him operating two different balloons, and General Butler's endorsement of La Mountain's list of expenses for the period notes only one balloon, the *Atlantic*, at a cost of \$350, memo from Gen. Butler dated August 13, 1861, Ibid., p. 211.
- <sup>16</sup> La Mountain to Butler, July 31, 1861, Ibid., p. 189; Haydon, *Military Ballooning*, pp. 92-94; *New York Commercial Advertiser*, August 1, 1861, p. 3; *New York Times*, 2 August 1861, p. 1.
- <sup>17</sup> *New York Commercial Advertiser*, August 5, 1861, p. 3; *New York Times*, August 6, 1861, p. 4; *New York Tribune*, August 6, 1861, p. 6; *Philadelphia Daily News*, August 6, 1861, p. 3; *Chicago Tribune*, August 9, 1861, p. 1; *Scientific American*, August 17, 1861, p. 104.
- <sup>18</sup> *Philadelphia Inquirer*, August 6, 1861, p. 8; *New York World*, August 7, 1861, p. 3; *Chicago Tribune*, August 9, 1861, p. 1; *Scientific American*, August 17, 1861, p. 104.
- <sup>19</sup> La Mountain to Butler, August 10, 1861, *O.R.*, Vol. 4, pp. 600-601; Henry Warren Howe, *Passages from the Life of Henry Warren Howe, Diary and Letters Written During the Civil War, 1861-1865*, Lowell, MA, Privately Printed, 1899, p. 27 – Howe was General Butler's orderly; *New York Commercial Advertiser*, August 12, 1861, p. 3; *New York Herald*, August 13, 1861; *New York Times*, August 13, 1861, p. 4; *New York Tribune*, August 13, 1861, p. 4; *Philadelphia Inquirer*, August 13, 1861, p.2; *New York Tribune*, August 14, 1861, p. 4; *New York World*, August 14, 1861, p. 3. There is some uncertainty as to ship used on this date; the August 14 *New York World* account states it was the *Fanny*, while the August 13 *New York Herald* story and Howe say it was the *Adriatic*. As General Butler's orderly, Howe's statement as to the general's whereabouts that evening would seem to have the most credibility. Also, Haydon, *Military Ballooning*, p. 101, writes that La Mountain made "five" ascensions during daylight on August 10, before making the night ascension from the *Adriatic*, citing as his source the *New York Tribune's* story of August 14. A re-reading of the story clearly states "...La Mountain made fine ascensions..." that day, rather than "five." La Mountain's own report, reproduced in the *Official Records*, says that he made two, as do the other newspaper articles cited above.

- 20 New York *Commercial Advertiser*, August 19, 1861, p. 2.
- 21 La Mountain to Butler, August 10, 1861, and Butler to Lt. Gen. Winfield Scott, Commander of the U.S. Armies, August 11, 1861, Butler, *Private and Official Correspondence*, Vol. 1, p. 206 (La Mountain to Butler of August 10 is also found in *O.R.*, Vol. 4, pp. 600-601.)
- 22 New York *Commercial Advertiser*, August 16, 1861, p. 3; Philadelphia *Daily News*, August 17, 1861, p. 3; La Mountain to Butler, August 13, 1861, Butler Papers, Box 7; Butler to Col. Thomas A Scott, Assistant Secretary of War, August 13, 1861, Butler, *Private and Official Correspondence*, Vol. 1, pp. 210-211.
- 23 Ibid.
- 24 Haydon, *Military Ballooning*, pp. 112-115.
- 25 Ibid., pp. 132-142 and 148-153.
- 26 Ibid., pp. 154-163.
- 27 Ibid., pp. 222-226; BGen Montgomery C. Meigs, Quartermaster General of the Army, to Lowe, September 25, 1861 (this correspondence is part of "The Official Report of the Operations of the Aeronautic Service," Lowe's final report of his service to Edwin M. Stanton, Secretary of War, dated June 4, 1863, *O.R.*, Series 3, Volume 3, pp. 252-319), p. 264.
- 28 Lowe to Maj Hartman Bache, Bureau of Topographical Engineers, July 29, 1861, *O.R.*, Ser. 3, Vol. 3, pp. 256-257.
- 29 Lowe to LtCol J.N. Macomb, October 21, 1861, Record Group (RG)-77: Records of the Office of the Chief of Engineers, Papers of Engineer Officers and Others, Entry 153: Papers of Col. John N. Macomb, Box 1, National Archives, Washington, DC. Early in October 1861 Macomb was given oral orders by BGen R.B. Marcy, McClellan's chief of staff, to supervise Lowe and the activities of the Aeronautic Corps. Macomb never was given a written explanation of either the authorities or responsibilities this task entailed, and he deferred to the aeronaut with respect to the work being done by the Navy, noting that Lowe told him "that he [Lowe] was duly authorized to get work done at the Navy Yard" – see Macomb to Maj Israel C. Woodruff, Bureau of Topographical Engineers, February 23, 1863, enclosure to File L852, RG-107: Records of the Office of the Secretary of War, Entry 18: Letters Received (Main Series), 1801-1889, Microfilm M221, Roll 237, National Archives.
- 30 Lowe, T.S.C., *My Balloons in Peace and War, Memoirs of Thaddeus S.C. Lowe, Chief of the Aeronautic Corps of the Army of the United States During the Civil War*, unpublished manuscript edited by Augustine Lowe Brownbeck, undated, Archives of the National Air and Space Museum, Smithsonian Institution, Washington, DC, pp. 65-66.
- 31 Capt John B. Howard, Assist Quartermaster, Army of the Potomac, to BGen Rufus Ingalls, Chief Quartermaster, Army of the Potomac, March 26, 1863, RG-92: Records of the Office of the Quartermaster General, Entry 225: Consolidated Correspondence File, Box 87, Subject: "Balloons," National Archives. Although a copy of McClellan's letter is not available in this folder (or found in other records), Howard describes the document as quoted in the text.
- 32 Lowe, *Memoirs*, p. 66; Lowe to Henry Forrest, Master Joiner at the Washington Navy Yard, October 14, 1861, RG-181: Records Of the Washington Navy Yard, Entry 576: Miscellaneous Correspondence Received, 1860-90, Box 1, National Archives; CDR John A. Dahlgren to Commodore Joseph Smith, Chief of the Bureau of Yards and Docks, October 23, 1861, RG-71: Records of the Bureau of Yards and Docks, Entry 5: Letters From Commandants, Washington, Box 320, Vol. 1, National Archives. The letter of October 14 from Lowe to Forrest, requesting that the Navy Yard construct the first of the gas generators, carried an endorsement stating, "Mr. Forrest was ordered to have the tank made as soon as possible. Oct 17 '61." Dahlgren also may have been influenced to assist Lowe by the commanding officer of the *USS Pocahontas*, CDR Benjamin M. Dove, who, in the process of a frustrating mission scouting for Confederate batteries established on the lower Potomac, mentioned that "Professor Lowe and his military balloon are the only means of ascertaining the fact of erection of fortifications," Dove to Dahlgren, July 4, 1861, Navy Department, LCDR Richard Rush and Robert H. Woods, editors, *Official Records of the Union and Confederate Navies in the War of Rebellion* (hereafter referred to as *O.R.N.*), Washington, DC, GPO, 1894-1922, Series 1, Volume 4, pp. 561-562 (all references to volumes in the *O.R.N.* are within Series 1).
- 33 Some publications erroneously refer to the balloon barge as the *USS* (United States Ship) *George Washington Park Custis*. The ship's steam propulsion was removed in 1856 and the Navy purchased it five years later as a barge, never commissioning it as a United States Ship.
- 34 Lowe, *Memoirs*, p. 86; Charles Dana Gibson and E. Kay Gibson, compilers of The Army's Navy Series: *Dictionary of Transports and Combatant Vessels, Steam and Sail Employed by the Union Army, 1861-1868*; Camden, ME, Ensign Press, 1995, p. 123; RG-41: Enrollments and Registers of Ships, "Record of Vessels" and "Citation of Marine Document" cards for the *G.W.P. Custis*, National Archives; William M. Lytle and Forrest R. Holdcamper, *Merchant Steam Vessels of the United States, 1790-1868* (The Lytle-Holdcamper List), revised and edited by C. Bradford Mitchell, Staten Island, NY, The Steamship Historical Society of American, Inc., 1975, entry for the *G.W.P. Custis*.
- 35 *Boyd's Washington and Georgetown Directory*, Thomas Hutchinson, Publisher, Washington, DC, 1860-1862, Washingtoniana Room, Martin Luther King, Jr., Library, Washington DC Public Libraries. These city and commercial directories of Washington and Georgetown, DC, for the years 1860 through 1862 have no information further identifying Mr. Fallon.
- 36 Exhibits by the Navy Agent at Washington, DC, for the Month of August 1861, RG-71, Entry 61: Navy Agent's Exhibits and Vouchers, Washington, Box 131, "Item 30: Receipt for the *G.W.P. Custis*," National Archives; Dahlgren to Smith, August 8, 1861, RG-71, Entry 5, Box 320, Vol. 1.
- 37 Dahlgren to Smith, August 12, 1861, Ibid.
- 38 Lowe to Henry Forrest, October 14, 1861, RG-181, Entry 576, Box 1.
- 39 Macomb to Woodruff, February 23, 1863, RG-107, Entry 18, Microfilm M221, Roll 237, File Number L852; Macomb to Welles, November 6, 1861, RG-45: Records of the Office of Naval Records and Library, Entry 36: Miscellaneous Letters Received by the Secretary of the Navy, Microfilm M124, Roll 389, Letter Number 121, National Archives.
- 40 Dahlgren to Welles, October 22 and 29, 1861, RG-45, Entry 51: Letters from Commandants, Vol. 87; Welles to Dahlgren, October 30, 1861, RG-45, Entry 489: Letters to Commandants, Washington, Vol. 1. After the fact, it does not appear that any of these canal boats were ever purchased, or at least, such a purchase does not show up in the accounts of the Navy Agent in



- Washington from October 1861 through March 1862.
- 41 Welles to Dahlgren, November 7, 1861, *Ibid*.
  - 42 New York *Herald*, November 13, 1861, p. 1.
  - 43 Lowe to Dahlgren, November 16, 1861, from the Papers of Thaddeus S.C. Lowe, Boxes 80-84, contained in the Papers of the *American Institute of Aeronautics and Astronautics*, Manuscript Division, Library of Congress, Washington, DC (hereafter referred to as the Lowe Papers; Lowe's correspondence is arranged chronologically in Boxes 83-84 – exceptions to this filing arrangement will be noted); Ebenezer Seaver to Lowe, inventory of Aeronautic Corps equipment at Budd's Ferry, 10 March 1862, Lowe Papers.
  - 44 Lowe to Macomb, October 21, 1861, RG-77, Entry 153, Box 1.
  - 45 Haydon, *Military Ballooning*, pp. 76-77, 86-88, 104; Lowe to Forrest, 14 October 1861, RG-181, Entry 576, Box 1.
  - 46 Lowe to BGen Fitz John Porter, a division commander in the Army of the Potomac, 16 September 1861, and Lowe to Colburn, December 3, 1861, *O.R.*, Ser. 3, Vol. 3, pp. 262 and 268.
  - 47 Lowe to Forrest, October 14, 1861, RG-181, Entry 576, Box 1.
  - 48 Haydon, *Military Ballooning*, pp. 247-250.
  - 49 New York *Times*, November 9, 1861, p. 1; Lowe to Forrest, October 14, 1861, RG-181, Entry 576, Box 1; George N. Beale, Naval Storekeeper, to the Quartermaster General, November 26, 1861, enclosure to File Number L852, RG-107, Entry 18, Microfilm M221, Roll 237.
  - 50 Lowe to Colburn, December 3, 1861, Ser. 3, Vol. 3, p. 268. It appears that Lowe could be demanding in his requests for assistance. In his letter of October 14, 1861, sent from Philadelphia, Lowe asked Henry Forrest to construct four tanks for the gas generators, to be completed by the 19th, only five days hence.
  - 51 Dahlgren to Smith, October 23, 1861, RG-71, Entry 5, Box 320, Vol. 1; Smith sent Dahlgren's requisition back the next day and told him to forward it to the Quartermaster General's Office, Smith to Dahlgren, October 24, 1861, RG-71, Entry 1: Letters to Commandants, Vol. 18.
  - 52 Macomb to Woodruff, February 23, 1863, enclosure to File L852, RG-107, Entry 18, Microfilm M221, Roll 237. The requisition itself was dated November 7, 1861, and probably was the same requisition for "lumber etc. for Professor Lowe," received by the Quartermaster General on November 14, 1861, per RG-92, Entry 19: Register of Letters Received, Volume 46. The author was not able to find a copy of the actual requisition within RG-92.
  - 53 Lowe to Porter, September 16, 1861, *O.R.*, Ser. 3, Vol. 3, p. 262.
  - 54 Beale to the Quartermaster General, November 26, 1861, enclosure to File L852, RG-107, Entry 18, Microfilm M221, Roll 237.
  - 55 Haydon, *Military Ballooning*, p. 255; Macomb to Dahlgren, April 18, 1862, RG-181, Entry 576, Box 2.
  - 56 Ebenezer Seaver to Lowe, March 10, 1862, Lowe Papers.
  - 57 Macomb to Welles, November 6, 1861, RG-45, Entry 36: Miscellaneous Letters Received by the Secretary of the Navy, Microfilm M124, Roll 389, Letter Number 121; Lowe to Dahlgren, November 16, 1861, Lowe Papers.
  - 58 Lowe, *Memoirs*, p. 86.
  - 59 New York *Times*, November 9, 1861, p. 1, dateline Washington, November 8.
  - 60 Lowe to BGen Joseph Hooker, November 11, 1861, Lowe Papers; Lowe to Colburn, November 12, 1861, *O.R.*, Ser. 3, Vol. 3, pp. 265-266; New York *Herald*, 13 November 1861, report of its Special Correspondent on the Lower Potomac, dateline Mattawoman Creek, November 10. Lowe did not state the identities of the "assistant aeronauts" with him, although it surely included William Paullin, who was to operate the *Constitution* at its post on the lower Potomac, and it may have included Ebenezer Seaver and/or John Starkweather, both of whom Lowe hired that month.
  - 61 New York *Herald*, November 13, 1861, report of its Special Correspondent, dateline Mattawoman Creek, November 11.
  - 62 Lowe to Colburn, November 12, 1861, *O.R.*, Ser. 3, Vol. 3, pp. 265-266; New York *Commercial Advertiser*, November 12, 1861, p. 2; New York *Herald*, November 13, 1861, p. 1; New York *Times*, November 13, 1861, p. 1; Washington *Star*, November 13, 1861, p. 2; Chicago *Tribune*, November 14, 1861, p. 1.
  - 63 Lowe to Colburn, November 12, 1861, *O.R.*, Ser. 3, Vol. 3, pp. 265-66; Washington *Star*, November 13, 1861, p. 2; New York *Herald*, November 24, 1861, p. 2, report of its Budd's Ferry Correspondent, dateline November 13.
  - 64 Hooker to BGen Seth Williams, Adjutant General, Army of the Potomac, November 12, 1861, *O.R.*, Vol. 5, pp. 407-408.
  - 65 New York *Herald*, November 14, 1861, p. 6; New York *Times*, November 15, 1861, p. 1.
  - 66 Philadelphia *Inquirer*, November 15, 1861, p. 4; Paullin to Lowe, November 14, 1861, Lowe Papers.
  - 67 The history of the *G.W.P. Custis* is poorly documented. Events such as those in November 1861 and the Peninsular Campaign of 1862 are reasonably well sourced through Lowe's correspondence and writings, the *Official Records* of the Army and Navy, and in newspaper accounts. After that, information concerning the activities and movements of the *G.W.P. Custis* is fragmentary. Much of it comes from scattered records in Lowe's Papers and at the National Archives that generally lack context, often requiring heroic assumptions about how the pieces fit into the story.
  - 68 Philadelphia *Inquirer*, November 28, 1861, p. 1.
  - 69 Clovis Lowe to T.S.C. Lowe, January 17, 1862, Lowe Papers.
  - 70 Philadelphia *Inquirer*, January 29, 1862, p. 8.
  - 71 Lowe to Macomb, February 13, 1862, Lowe Papers.
  - 72 Seaver to Lowe, March 10, Lowe to Seaver, March 8, and Lowe to Macomb, March 15, 1862, all in the Lowe Papers.
  - 73 Lowe to Dahlgren, telegram of March 19, 1862, RG-94: Records of the Adjutant General, Entry 168: Records Relating to Pilots, the Balloon and Construction Corp, and Sutlers, Box 1, Folder "Balloons," 2 of 2; Hooker to Lowe, March 20, 1862, and Ingalls to Lowe, telegram dated March 24, 1862, both in the Lowe Papers.
  - 74 Lowe to Col. D.H. Rucker, Aide de Camp and Assistant Quartermaster, Washington, January 7, 1862, Lowe Papers; as an interesting aside, in this note Lowe asked that the *G.W.P. Custis* be towed from Georgetown to "...Bell Plain with apparatus belonging to the Aeronautic Corps on board." Unless this is an unofficial name of a Washington-area location during the Civil War, the only "Bell Plain" in the region reachable by water was Belle Plain, Virginia, a landing on the Potomac River about 50 miles south of Washington and occupied by the Confederates at that time. If Lowe's cryptic note referred to a possible balloon reconnaissance of the artillery batteries along the Potomac down to Belle Plain, there is no record of it being carried out.
  - 75 Glassford, Capt William A., "The Balloon in the Civil War,"

- Journal of the Military Service Institution of the United States*, Governor's Island, New York, Vol. 18, No. 80, March 1896, p. 261.
- 76 Ibid., p. 266.
- 77 Haydon, *Military Ballooning*, p. 258.
- 78 For example, see Eugene B. Block, *Above the Civil War, the story of Thaddeus Lowe, balloonist, inventor, railway builder*, Berkeley, CA, Howell-North Books, 1966, p. 64; Juliette A. Hennessey, *The United States Army Air Arm, April 1861 to April 1917*, General Histories, Office of Air Force History, United States Air Force, Washington, DC, 1985, p. 6; Mary [Duprey] Hoehling, *Thaddeus Lowe: America's One-Man Air Corps*, New York, Julian Messner, Inc., 1958, p. 128.
- 79 Camagna, Dorothy, *The C&O Canal*, Gaithersburg, MD, Belshore Publications, 2006, pp. 28, 49; Mike High, *The C&O Canal Companion*, Baltimore, Johns Hopkins University Press, 1997, p. 65; National Park Service, *Chesapeake and Ohio Canal (Handbook 142)*, Division of Publications, National Park Service, U.S. Department of the Interior, Washington, D.C., 1991, p. 56. With a length of 122 feet and beam of 14 1/2 feet, the *G.W.P. Custis* was too large to fit through the smaller locks on the canal during the time of the Civil War, which restricted canal boats to an overall length of about 90 feet and a beam of 14 feet.
- 80 Lowe to J.C. Freno and James Starkweather (John Starkweather's brother), at Edwards Ferry, undated, circa early March 1862, and Lowe to Porter, in Arlington, Virginia, telegram of 9 March 1862, both documents in RG 94, Entry 168, Folder: "Balloons," 2 of 2.
- 81 Colburn to Lowe, November 16, 1861, and Colburn to Lowe, November 22, 1861, both in *O.R.*, Ser. 3, Vol. 3, pp. 266-267. On November 1, 1861, Lt. Gen. Winfield Scott retired as the General of the Army, in overall command of all the field armies. Lincoln immediately gave this position to McClellan, while retaining McClellan as the head of the Army of the Potomac.
- 82 Colburn to Lowe, November 22, 1861, with endorsement from Gustavus V. Fox, Assistant Secretary of the Navy, *ibid.*, p. 267.
- 83 Philadelphia *Inquirer*, November 28, 1861, p. 1, via special correspondent "B."
- 84 New York *Commercial Advertiser*, November 29, 1861, p. 3; Philadelphia *Inquirer*, November 29, 1861, p. 4, via special correspondent "B," titled "Our Balloon Letter."
- 85 New York *Commercial Advertiser*, December 30, 1861, p. 3; Detroit *Free Press*, December 31, 1861, p. 1; New York *Times*, December 31, 1861, p. 8; New York *Tribune*, December 31, 1861, p. 3; Philadelphia *Daily News*, 31 December 1861, p. 3; Haydon, *Military Ballooning*, p. 378, footnote 16.
- 86 Starkweather to Lowe, 7 January 1862, Lowe Papers; Starkweather to Lowe, [January 13, 1862], Lowe Papers, Box 83, Folder: "1862."
- 87 Starkweather to Lowe, April 3, [1862], Lowe Papers, Box 84, Folder: "Undated (3);" Starkweather to Lowe, April 10, 1862, Lowe Papers, Box 84, Folder: "Undated (1)."
- 88 Starkweather to Lowe, April 15, 1862, Lowe Papers, Box 84, Folder: "Undated (1)."
- 89 Starkweather to Lowe, April 19, 1862, Lowe Papers, Box 84, Folder: "Undated (1);" New York *Times*, May 19, 1862, p. 8.
- 90 New York *Times*, May 19, 1862, p. 8, dateline Fort Pulaski, Monday, May 4; Lt P.H. O'Rorke to BGen Quincy A. Gillmore, BGen Benham's Chief Engineer Officer, May 7, 1862, RG 94, Entry 168, Folder: "Balloons," 2 of 2.
- 91 The *Official Records* uniformly spell the ship's name as *Mayflower*, although official maritime records list it as the *May Flower*; see RG-41, Bureau of Navigation Headquarters Records, Official Number Files, Box 54, File Number 8303. Starkweather used both spellings in his correspondence to Lowe.
- 92 O'Rorke to Gillmore, May 7, 1862, RG 94, Entry 168, Folder: "Balloons," 2 of 2.
- 93 New York *Times*, May 19, 1862, p. 8.
- 94 Starkweather to Lowe, April 10, April 15, and April 19, 1862, Lowe Papers, Box 84, Folder: "Undated (1)."
- 95 Haydon, *Military Ballooning*, p. 383, footnote 38, citing as the source a letter from Starkweather to Lowe, 9 May 1862, Lowe Papers – the author could not find this document in the collection; New York *Times*, May 13, 1862, p. 8; Chicago *Tribune*, May 14, 1862, p. 1, both citing the Savannah *Republican* article of May 8, 1862.
- 96 BGen Alfred H. Terry, commanding troops at Fort Pulaski, to BGen Henry W. Benham, commanding the Department of the South, May 20, 1862, *O.R.*, Vol. 14, pp. 343-44.
- 97 Charleston *Mercury*, May 30, 1862, p. 1, quoting the "Savannah News" of May 29; the Savannah press reported the balloon flight of 8 May, from the *May Flower*, but not the one on May 20, from Fort Pulaski, so it seems a reasonable assumption that the flights on the May 27 occurred from the ship.
- 98 Starkweather to Lowe, June 5, 1862, Lowe Papers.
- 99 Ibid.
- 100 Ibid.
- 101 BGen Isaac L. Stevens, commanding a brigade at James Island, to Benham, June 7, 1862, *O.R.*, Vol. 14, p. 986; Starkweather to Lowe, September 14, 1862, Lowe Papers.
- 102 Todd, William, *The Seventy-Ninth Highlanders, New York Volunteers, in the War of Rebellion, 1861-1865*, Albany, NY, Press of Brandow, Barton & Co., 1886, p. 145; General Stevens was BGen Isaac I. Stevens, one of Benham's brigade commanders.
- 103 Starkweather to Lowe, September 14, 1862, Lowe Papers.
- 104 Charleston *Mercury*, June 28m 1862, quoting a letter from the Hilton Head correspondent of the New York Herald, published in the Herald on June 9, 1862.
- 105 Starkweather to Lowe, September 14, 1862, Lowe Papers.
- 106 Ibid.; Starkweather to Lowe, June 5, 1862, Lowe Papers.
- 107 Benham to MajGen David Hunter, pp. 983-986; Terry to Benham, May 20, 1862, pp. 343-44; Stevens to Benham, June 7, 1862, p. 986; all three letters are found in *O.R.*, Vol. 14.