

## Chapter V

### A WAR OF POSTS: FROM LONG ISLAND TO TRENTON, 1776

Long before New York City became a center of military conflict in the Revolution, both sides recognized its strategic importance. To the Americans New York was vital to maintaining control of the whole Hudson River valley and thereby preventing the severing of New England from the middle states. The British, on the other hand, not only understood this point but also dreamed of gaining the active support of New York's Loyalist population. In 1775 events in Massachusetts required the antagonists to concentrate their efforts around Boston. As it was then thought that the Revolution would soon extinguish itself (the British view) or triumph (the American view) in Massachusetts, concern about New York was minimal.

By 1776, however, the situation had begun to change. In January the patriots still had the British boxed in at Boston, but American intelligence indicated the enemy's fleet was preparing to depart. Maj. Gen. Charles Lee, third in seniority after Generals George Washington and Artemas Ward, strongly urged action. Horrified at the prospect of the British occupying New York, he urged Washington to detach him there by way of Connecticut, where he would raise troops for the city's defense.<sup>1</sup> Washington complied, and on February 4 Lee arrived in New York City. For the next month he and Capt. William Smith, an engineer assistant borrowed from duty in New York City, made surveys and prepared a defense plan.

Lee had no formal engineer training. Yet because of his experience in both Europe and America as an officer in the British army, his knowledge of fortifications exceeded that of most American generals at the time. Notably, his plan cites the problem of defending New York without controlling the surrounding waters. The patriots could never hope to make New York an impregnable fortress, he argued. Rather their goal should be to fortify the city so extensively that taking it would cost the enemy dearly.

**THE OPPOSING ARMIES AT NEW YORK CITY, 1776.** *This map, reproduced from an unidentified book, shows the position of both armies in the area surrounding New York City on August 27.*

National Archives

Lee's fear of New York's considerable Loyalist population led him to advocate disarming the residents of Staten Island, and, for further safety, taking their children as hostages!

### 1. "NEW-YORK . . . MAY BE MADE A MOST ADVANTAGEOUS FIELD OF BATTLE"

#### Charles Lee's Plan for the Defense of New York and Long Island.

March, 1776

The command of the passage of the Sound [Hell Gate] must be ours. This, I imagine, is already effected by the works thrown up at Horn's Hook; but as a further security, batteries and a redoubt must be erected on the other side, either on Montresor's Island, or on the continent of Long-Island, as the Engineer and succeeding General shall determine. These additional works are not solely meant to shut up to the enemy the passage through the Sound, but to secure a free, open, and easy communication to our own troops, between the continent of New-York and Long-Island. As the city of New-York is almost environed by navigable waters, it is undoubtedly very difficult to fortify it against a powerful sea armament; but still I am of opinion that, although troops cannot easily be prevented landing under the guns of their shipping, they may be prevented lodging themselves in it, or converting it into a great place of arms, as they have done Boston.

The East-River, I am almost persuaded, may be secured in such a manner that their ships will scarcely venture into it, or at least they cannot keep their stations when in. A battery for this purpose is planned, and in some forwardness, at the foot of the Jews' Burying-Ground. To protect this battery from the near approach of ships, (which, when close, are always supposed to be an overmatch for batteries level with the water, and in a low situation,) guns in barbet, placed on the heights of the Jews' Burying-Ground, when in correspondence with a battery I have ordered on an opposite commanding knoll in Long-Island, will certainly be sufficient. These two fires will likewise be crossed by a third, of a very considerable range, from a work in the front of our intrenched camp on Long-Island; which work is likewise answered by a battery sunk in a cellar on the opposite wharf. Such is our plan with respect to the East-River.

Having attentively examined the fort [Fort George] and great batteries under it, and considered whether they could be of any possible use to us, I am of opinion that, as ships of great burden can approach so near the latter, it will be dangerous, if not impracticable, to support them. The fort cannot, for the same reason, be defended. But although it is not possible, in our hands, to render it a fortification of offence against the enemy, it



#### **CARICATURE OF CHARLES LEE.**

*To his position as major general in the Continental Army Lee (1731-82) brought considerable military experience in both America and Europe, where he had achieved the rank of major general in the Polish Army in 1767. Lee came to America in 1773 and heartily endorsed the patriot cause. During the Revolutionary War he served in Boston, New York, New Jersey, and South Carolina. Always controversial, Lee was court-martialed in 1778 for insubordination during and after the Battle of Monmouth. Kosciuszko made this sketch of "a suspended Gen'l" after Monmouth.*

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might, in their possession, be converted into a citadel, to keep the town in subjection. These considerations have induced me to throw down the North-east and North-west Bastions, with the communicating curtain; so that, being entirely open behind, and a commanding traverse thrown across the Broadway, with three guns mounted, it is impossible for the enemy to lodge themselves in and repair the fort.

The North-River [Hudson] is so extremely wide and deep that it is in vain to think of any means to prevent the men-of-war commanding the navigation of it; but it does not appear to me that they have it in their power to annoy dangerously the town, much less to destroy it. It is true an accidental shell may do great mischief; but the effects of their cannon are not, I think, much to be apprehended, for there is a most fortunate ridge or eminence, which not only serves as a screen of protection for the town, but on which any number of batteries may be erected, to keep the ships at a distance.

I must observe, once for all, that New-York, from its circumstances, can with difficulty be made a regular tenable fortification; but it may be made a most advantageous field of battle-so advantageous, indeed, that if our people behave with common spirit, and the commanders are men of

discretion, it must cost the enemy many thousands of men to get possession of it. The streets must be traversed and barricaded, so as to prevent their coming on our flanks; and three redoubts thrown up on the three eminences: Judge Jones's, Bayard's Hill, and either Lispenard's or Halderman's house, on Hudson's River. But these measures are not to be confined to the town. The whole Island is to be redoubted in certain regular steps, if I may so express it, quite to Kings's Bridge. These redoubts, redans, or fliches [fleches?] are easily thrown up, and are no expense.

The leading roads from Hudson's River, whence the enemy can alone approach, must be obstructed to artillery. King's Bridge must be strongly fortified, to preserve the communication free and open with Connecticut, on which Province you can alone depend for succors of men; for the breadth and depth of the North-River renders the communication with Jersey too precarious.

The possession and security of Long-Island is certainly of still greater importance than New-York. I have accordingly marked out a camp, fortified by a chain of redoubts, mutually supporting each other, and which, also corresponding with the batteries on the New-York side, will prevent the enemy's entering or remaining in the East-River. This camp is intended to contain four or five thousand men. Upon the whole, for the defence of Long-Island and New-York, eight thousand, at least, regular troops, will be necessary. . . .

I have now, in a military capacity, to the best of my recollection, mentioned every circumstance relative to the defence and security of New-York and Long-Island. But I think it my duty to observe that all these measures will be totally fruitless unless some precautions are taken with respect to the professed enemies of American liberty, nested in the very spots where they can do the greatest mischief—Queen's County and Staten-Island. . . . I would . . . humbly propose that the inhabitants of Staten-Island should, without loss of time, be disarmed, and their arms delivered to some regiment already raised, but unfurnished with muskets.

I do not imagine that the disarming the Tories will incapacitate them from acting against us, as they can easily be supplied by the ships. I should, therefore, think it prudent to secure their children as hostages. If a measure of this kind (hard as it may appear) is not adopted, the children's children of America may see the fatal omission.

—Force, *American Archives*, 4th ser., 5:214–15.

Washington felt Lee's plan "a very judicious one,"<sup>2</sup> but fast-moving developments in March assured the plan would have little chance of being fully carried out. Lee lacked men and barely saw construction started on his defenses when Congress gave him command of the newly created Southern

Department of the Continental Army. On March 7 Lee headed south, leaving New York City in the hands of Brig. Gen. William Alexander, Lord Stirling. With Lee's departure the defense of the city entered a new phase.

Capt. Jeduthan Baldwin provided the best account of progress made under Stirling's command. Baldwin's engineering tasks included drawing plans, tracing works, and overseeing their construction. That additions to Lee's plan were already under way was evidenced by Baldwin's work at Red Hook and Governor's Island, two new locations.

## 2. THE REBELS FORTIFY NEW YORK AND LONG ISLAND

From Jeduthan Baldwin's journal.

26. [March 1776]. Rode in Company with my Lord Sterling and Col. Smith with a No. of other Gentr to view the works round the Sitty and at the west End of Long Island. Dind with Genl. Thomson. . . .

27. Went round to the Several works in Town and out to the Fort at Hellgate or Horns hook where we dind.

28. Wrote Mr. John Adams. Laid out some work on Ship battery Hill. . . .

29. Rode round the works with the Genls. in ye forenoon, and in the afternoon gave an order to Capt Bruen for to provide materials for [the] Barrak at fort Ld. Sterling, bought a Cutlass for 16 1/2 Dol.

30. Began the work' on the old Fort to raise the parapet. It snowd this afternoon. Genl. Heath came to Town with Col. Groton' and Several other Regts.

31. Sunday. The men Excused from fateague and the ground was coverd. with snow and water.

April 1. Begun the old battery. Went round to ye Several works with Genl. Heath and others.

2. Went to long Island with Genl. Heath and my Ld. Sterling and others. Laid out and proposed several works there. In the Evning a party of our men, 200, went onto the Island by the Man of war and Set fire to the buildings, brought off Intrenching tools, fowls, etc. that belonged to Govr. Trion and returnd Safe. . . .

3. Drawd plan for 2 Works on Long Island, bought a Coat and Jaceat for 15 dollars. It rained in the forenoon. No fateague. The Sitzens Excused from fateague. Heard that the fleet was Sailed from Boston. Genl Putnam Came to this City.

4. Went Round to the Several works with Genl. Putnam and the other Genl. Officers. In the afternoon I went to horns hook, fort Thomson. A fine Day but windy.

5. To Long Island. Col. Smith went with Genl. Sterling to ye Gersies [Jerseys]. I laid out a Battery at ye heighth by ye feray on long Island. I

went with Genl. Putnam and Genl. Thomson to Horns Hook.

6. Went to Red Hook.

7. Sunday. No fateague in the forenoon. Fireing over the Bay at ye Jerseys, our riflemen took 9 and killd 3 of the Enemy, who came to take in Warter, with the loss of only one man wounded. Went with Genl. Putnam, Thomson, Col. Mifflin and Trumbull upon Governours Island and concluded to fortify that place. . . .

8. Went to Red Hook with Genl. Thomson, laid out a Battery on that point, and then I went to Governours Island, laid out the Fort. At dark one thousand men came on with the tools and went to work and before morning we had a fine trench. It rained all night and was Very uncomfortable. . . .

12. A wet snowey morning. Workt on the Fort and Battery with 400 men.

13. Wort at the Battery. Genl. Washington came to town, with Genl. Gates and others.

14. Workt. at the battery. Went to Long Island and to Govenours' Island where the troops workt. . . .

16. To Govenours Island. It rained. Recd. orders to get ready for to go to Quebec.

—Baldwin, *Revolutionary Journal*, pp. 31–34.

The decision to erect a chain of redoubts and breastworks from Wallabout Bay to Gowanus Marsh represented a modification of Lee's proposal for Long Island. At first Lee apparently intended to hold the Brooklyn Heights along the East River.<sup>3</sup> The new line would be further east.

Washington thought New York City in imminent danger of enemy takeover. He feared that the British, having been driven from Boston, would sail for New York rather than Halifax, Nova Scotia, as was widely expected. Washington warned Stirling: New York "is the Place that we must use every endeavour to keep." Once the British held New York, Washington contended, control of the Hudson River would follow. Then the enemy could sever communications between the northern and southern colonies, "upon which depends the Safety of America."<sup>4</sup>

As it turned out, the British did sail to Halifax; but Washington still saw New York as the next field of battle and moved there to join the bulk of his army. He ordered Col. Rufus Putnam, who had served the Continental Army in Boston as an engineer, to New York as his Chief Engineer. Over the next several months Washington relied heavily on the one-time millwright to lay out and oversee works in New York, New Jersey, and Long Island. "This was a Service of Much Feteague," Putnam later recalled, "for my whole time was taken up from daylight in the morning untill night in the business, besides Sometimes going in the night by Warter from New york to Fort Washington."<sup>5</sup>

On June 25, as anticipated, three warships with General William Howe and a small contingent of British troops aboard arrived from Halifax. Several days later, having observed American progress at fortifying Long Island, Howe chose Staten Island for his main encampment. Ultimately he assembled a force of some thirty-two thousand men, including eight thousand Hessians (German mercenaries) —“the greatest expeditionary force Great Britain had ever sent out from her shores.”<sup>6</sup> That summer of 1776 the British virtually held the rebels—fewer in number, less well supplied, and without warships—in the palms of their hands. Yet several times Howe failed to move decisively. On July 12, for example, two British warships advanced forty miles up the Hudson. They returned the following week relatively unscathed, although under fire from American batteries all along Manhattan Island. Having flaunted American defenses, Howe still made no move against the forces stationed on Manhattan. Although the British commander genuinely feared allowing the Americans time to erect fortified positions, orders from London restrained him from acting.

The successful movement of British vessels up the Hudson sparked Robert Erskine, a Ringwood, New Jersey, ironmaster, to propose that chevaux-de-frise, generally used in Europe to block troop movements on land, be sunk under water to inhibit British vessels. Erskine, the future United States geographer, designed a model—described in his letter below—which he forwarded to Brig. Gen. John M. Scott of the New York militia. Erskine felt sure there was still time to employ the obstructions effectively in New York, or, at the very least, upriver.

### 3. ERSKINE DESCRIBES HIS MARINE CHEVAUX-DE-FRISE

Robert Erskine to John Scott.

Ringwood, July 18th, 1776

Dear Sir:—When I heard that some ships of war, with a fair wind and tide of flood, had passed the batteries with little or no damage [12 July]; I could not help regretting that the Channel was left open. I know it has been proposed to stop it up, but the present exigency requires some contrivance, that shall be both speedily executed and effectual. After canvassing this matter a little time, an invention which I beg leave to call a Marine Chevaux-de-Frise occurred. Of this I have sent you a model . . . .

Supposing, therefore, the Model to be before you, you will observe it consists of six pieces; it is made to a scale of half an inch to a foot. The pieces then represent beams a foot square and about 32 ft. long. If they were 13, 14 or 15 inches square, so much the better. The nails which join the pieces represent bolts (with a head on one side, to be keyed or screwed with a nut on the other), about 1 1/2 inches thick.

The Carpenter work is very little, each piece having only two notches, bevelled 60 degrees, or the angle of an equilateral triangle, and cut on one side about one-third of the thickness. . . . Any carpenter may line, square, notch and bore such pieces without knowing their use; in the same manner the blacksmith may be directed to make the bolts, and shoe them with sharp round iron, which is represented by the black upon the model. The beams could be shod all along like the spare piece, as then the iron would render it specifically heavier than water, but if the points are only shod, it will be necessary to plank in the . . . Tetrahedron, to contain pig iron or stones sufficient to sink it.

There is but one right way of putting the model together, which makes it necessary—though it appears simple—to observe it attentively and comprehend its construction before it is taken to pieces; when the construction is well understood, its putting together is very easy; if the pieces are all of the same dimensions and the notches alike—which they should be—they will fit any way. But to give a true practical idea of taking it to pieces and joining it again, please observe that the Tetrahedron has four horned corners, numbered 1, 2, 3, 4, and three horns to each corner. Place corner No. 1 uppermost. . . .

Any vessel being swept upon horns within 14 feet of the surface, would strike it, which must be attended with some of the following consequences: She would either be staked upon it, or her velocity over-set it, the other horns would then rise and take her in the bottom (which probably would make holes through her and oversett her too), or else she would break the “Chevaux-de-Frise” by her weight, which no ship could do without receiving such material damage as to render her unfit for service. . . .

But I need not further enlarge. I shall be happy if it could be put in practice soon enough to incommode our enemies at New York; if too late, then it may be practical elsewhere, particularly to prevent the approach of ships to the forts up the river.

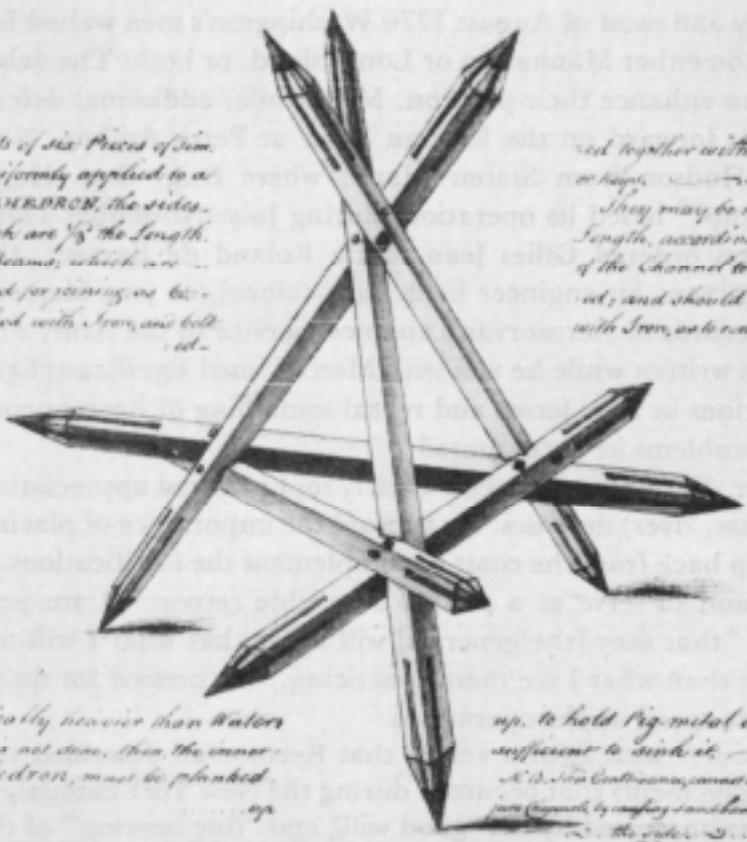
It will naturally occur that this “Fence” should be placed in a channel commanded by a battery to prevent boats weighing them. Two “Chevaux-de-Frise” would reach about 60 feet or 10 fathoms [because the horns of one would be within twenty feet of the horns of the other], 20 would make over a channel of an hundred fathoms. Were they scattered here and there in a harbour or anchorage ground, it would render it very unsafe. I shall be happy if this invention could be put in practice soon enough to incommode our enemies at New York; 20 or 30 carpenters and a proper and able number of blacksmiths might finish as many as needful in 30 days. Those ships which have got up, however, may be fenced in at Kingsbridge, or elsewhere. They may be used to prevent ships approaching the forts in the Highlands . . . .

—Heusser, *Washington's Map Maker*, pp. 147—50.

The  
**Marine Chevaux de Frise,**

Consists of six Pieces of Tim-  
ber, uniformly applied to a  
**TETRAHEDRON**, the sides  
of which are  $\frac{1}{8}$  the Length  
of the Beams, which are  
Notched for joining as be-  
comes shew'd with Iron, and bolt-  
ed.

ed together with Bolts, Nails,  
or hoops. They may be made of any  
Length, according to the depth  
of the Channel to be obstruct-  
ed; and should be so intirely  
with Iron, as to render them  
speci-



specifically heavier than Waters  
of this is not done, then the inner  
Tetrahedron, must be planked  
up.

up, to hold Pig. metal or Stead-  
sufficient to sink it.  
It is also Contrivance, carried on the Boat in  
port (as shew'd by ramping) and likewise intirely  
the Water.



Robert Erskine F.R.S. Inven. et Del. 1776.

**ROBERT ERSKINE'S CHEVAUX-DE-FRISE.** Although used for obstructions in the Hudson River between Forts Washington and Lee, Erskine's design was deemed impractical for Philadelphia because of the soft floor of the Delaware River.

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Erskine's idea soon materialized with the placement of chevaux-de-frise opposite Fort Washington. But the rebels never finished the line from shore to shore, and the British continued to pass up and down the river with considerable freedom.

A month later Erskine offered his device to Benjamin Franklin for possible use in Philadelphia. Erskine saw great potential in the underwater obstacles, which, "dropt here and there in anchoring grounds and Harbours, would render them very unsafe." Since the current could flow uninhibited under each cheval, it would neither injure the channel nor interfere with the tide. Another advantage, Erskine argued, was that the chevaux could be assembled and stored until needed, as it only required a few hours to rig and sink them.<sup>7</sup>

Throughout July and most of August 1776 Washington's men waited for the British to move on either Manhattan or Long Island, or both. The delay allowed the rebels to enhance their position. Meanwhile, additional defensive operations went forward on the Raritan River at Perth Amboy, New Jersey, across the Hudson from Staten Island, where Brig. Gen. Hugh Mercer's "flying camp"<sup>8</sup> based its operations during July–November 1776. On July 16 Congress ordered Gilles Jean Marie Roland de Barazer, the Chevalier de Kermorvan, an engineer lieutenant colonel, to join Mercer's flying camp. Few records of Kermorvan's engineer service to the Army survive; but two letters written while he was with Mercer, shed significant light on defensive operations in New Jersey and reveal something of Kermorvan's character and the problems he encountered.

In the first letter, Kermorvan evinced a fairly sophisticated appreciation of coastal (in this case, river) defenses. He stressed the importance of placing an entrenched camp back from the coast to complement the fortifications at a river's entrance and to serve as a readily accessible retreat. "I am persuaded," he wrote, "that they [the generals] will agree that what I will tell them is worth more than what I see them practicing." He pressed for quick action by Congress to speed up the operations.

The brief encounter with British vessels that Kermorvan described was typical of many engagements that occurred during the New York campaign. The Frenchman was impressed by the "good will" and "fine bearing" of the American troops.

#### 4. "I ONLY WISH FOR SPEED IN OPERATIONS"

**The Chevalier de Kermorvan to Benjamin Franklin.**

[Perth Amboy] July 26, 1776

Sir

. . . I have seen a part of the terrain, and I have busied myself with its defense; I have found the best of intentions in General Mercer, everyday I

go to him to request his orders, and what he wants me to do, that gives me the opportunity to pose to him some questions on the position of the troops, on the communication of the patrols between here and Voodbridge [Woodbridge] and from Voodbridge to Elizabeth town, this part seems to me very weak however since I have spoken of the necessity to guard and watch over carefully all the points of the coast, I think that General Roberdeau has gone to Voodbridge to profit by and work up what I have said. I had passed to Mr. Hancock a general plan for the defense of the coasts of America,<sup>9</sup> I based it on the idea which I had taken from the terrain of Amboy and on the forces which we have there. I doubt that you will be able to put as many in all the parts but it is very necessary to execute it to cover and protect the cities of the interior. We do not have a stronghold to stop the enemy if he has the least advantage but if we form some entrenched camps at a mile or a half mile from the coast I defy all the powers of Europe to penetrate the lands. Especially if we fortify the entry of the rivers on the two coasts. If you had made these manoeuvres there in Canada you would not have pulled back farther than your entrenched camps where you increase the entrenchments in case you may be attacked and where the troops find an asylum for their courage when enemy numbers weigh them down. If the Congress feels the necessity of executing this plan of operation, it must certainly order its generals to do so, and if they have confidence in me, I will suggest to the generals the dispositions and manoeuvres to make when the enemy lands, I am persuaded that they will agree that what I will tell them is worth more than what I see them practicing. On the occasion of the little alarms that we have had yesterday and the day before yesterday on account of the passage of some little boats which skirted along Staten Island. I was delighted by the good will of our troops and by their fine bearing. In truth it would be a crime for good fellows like them to be victims of bad manoeuvres or dispositions. The day before yesterday during a big storm the sentinels noticed a boat which skirted Staten Island under cover of the night. The lightning bolts which were the only light in the sky discovered it to the sentinels which shot at it, immediately the whole troop on its own took up arms and descended to the bank, the boat made its course and we retired into our quarters. Yesterday four or five other little boats apparently loaded with wheat appeared at four-o'clock in the afternoon, they kept as far away as they could from our shore, we fired from our poor battery, first with the two little pieces of cannon; the enemy to protect these boats cannonaded our battery with three or four huge pieces of eighteen pound ball. This little combat lasted about two hours, our cannoniers firing with their little pieces as well as our enemies, they had the best bearing. During the whole battle I remained on the battery with General Mercer who had brought our two largest guns with which we touched the sails of one of these boats at a great distance. The range was too long for our pieces.

I only wish for speed in operations, one loses time without doing anything. Since I have been here, with the good will that our soldiers have for working, I would have already done a great deal of work which would have protected the entry of the Brunswick River [Raritan], where the enemy can draw us in order to make his descent to Amboy: we [?] fearing for the Jersey interior, would bring ourselves quickly there while the enemy would take over Amboy, in indulgence I ask on bended knees that the Congress decide to order speed and all will go well in our war. From extreme slowness in counsels, but the greatest speed in military operations. From this campaign here depends the liberty of America.

I forgot to tell you, Sir, that three of our people were wounded yesterday, not on the battery but one in a house and the others on the shore where they were watching, a horse was killed by a cannonball at a few fathoms from General Mercer's house.

If they construct the batteries or the fort that I have proposed to build here on the river, it will be necessary to send iron cannons with rampart mountings. Those which I have seen in the courtyard of the townhall would be good. Act, I implore you sir, such that they may decide and that the Congress may decide on swiftness in the operations so that we can be ready to receive milord [Howe] if he comes on one of our coasts with a strengthening-piece [gun] such as they say he is bringing. I wish you sir, good health and I pray you to accord and continue for me your friendship which I strive to merit as the friend of men and of liberty.

—Butterfield, "An Episode of '76," pp. 38–40. Translated by Patricia H. Stablein.

Kermorvan's second letter reflects much greater impatience with Congress and contains a reminder that European governments were observing military operations in America. He believed Congress had failed to understand his plan—perhaps thinking it too ambitious—and therefore had done nothing to carry out the small part pertaining to Amboy. Kermorvan displayed a considerable knowledge of batteries and river obstructions. Most importantly he detailed problems of command commonly encountered by engineers while overseeing fortifications, problems that were intensified for a foreigner.

Kermorvan seemed genuinely committed to the American cause of independence, and in his sharp annoyance with both Congress and the forces working for him he charged that "they wish almost all to have liberty without acquiring it."

## 5. "THE CRUCIAL POINT IS TO BRING THE CAMPS ON THE COASTLINE CLOSER TOGETHER"

The Chevalier de Kermorvan to Benjamin Rush.

Perth Amboy, about August 12, 1776

Sir

. . . I have perfectly felt the reasons which compell that it [Kermorvan's defense plan] will not be executed until the enemy has landed. Your people do not wish to work and see the danger only when the enemy is on them. The work of an entrenchment camp is nothing. It is the affair of one day for the troop which is in this camp. It is only an elevation of earth more or less high, more or less thick according to the terrain; moreover I had never meant to entrench 1500 miles of coastline, this work would be as useless here as the great wall of China which did not preserve that empire from being conquered by the tartars. All the same when you wish to protect a country, a province, there are no other means than to put, in flat places void of woodlands and other defenses, an entrenched camp and to occupy the heights with good artillery and the woodlands with infantry. Amboy is a place completely void of woods which has a circumference of two miles. If it is true that in all America the countryside is covered with woods, you have much less to fear, but in the present circumstance if we do not manage to keep the enemy from landing in the center of the colonies, we will lose our reputation in Europe which has its eyes wide open on us; thus the crucial point is to bring the camps on the coastline closer together because they are too far apart; then, if unfortunately the enemy lands, your people, seeing him entrench himself on his arrival, will not make themselves be begged to work, and, when they have the good will, you will admit, Sir, that is possible.

As far as forts at the mouths of rivers is concerned, as you do not have big cannons of 24, 36, and 48,<sup>10</sup> it is virtually useless to construct anything but simple batteries to stop the landing of troops and the passage of boats and the best defense of rivers whose mouths are wide will be to have galleys armed with big cannon or armed boats; because cannonballs of six and eight like we have here, have no effect on a ship and do not stop it one instant from passing. It is equally necessary to sink in the middle of passages some enchained piers, on the same level as the water but that will have to be done this winter because it is too late now.

I never would have imagined that if it is true that you cast cannon as everyone says, you do not cast the two thirds of large caliber, one does not make war profitably without the large cannon. Thus on a river where

one wants to stop floating citadels, like ships, from passing, it is necessary to have only in the narrow places, as at Billingsport,<sup>11</sup> some batteries of large bore cannon, then there is not a ship of the line which dares to pass under a fire so close . . . we know in Europe that ships do not dare pass under the fire of St. Malo and of Brest. But these advantages are too dear for a budding republic, just simple batteries to stop boats coming down; some galleys or armed boats, sunken masses in the river passages—that's all you need as you have very judiciously reflected.

It is not as easy in a republic to execute great things right away because the consent of everyone is not easy to gather and all men do not think equally well in favor of the good cause; I see that they wish almost all to have liberty without acquiring it. I was more happy with their conduct at Philadelphia than here, you bourgeois give an example of ill will very harmful to our cause. In truth I believe that men are born to be slaves, for the most part, still they do not merit that one bothers oneself to look after their interest and to command them. I have made a battery which is very well placed, the cannons will fire and do a good job defending the river, the fire is well directed, but your people have so badly executed it against my will that I am embarrassed to have undertaken it. From the first day they have rebelled and have had it said to me that my way of making them place the sod and fagots was not to their taste and that they do not wish to do other than what they have always done, that they do not, moreover, want to work uselessly, that the enemy will not come into the river and that finally they are not paid to work. All these words and their discontent overwhelmed me. I had them told to do as they wished; I have in spite of that been to see them work twice a day and direct them in the plan of the work, they have placed the sod which has a slovenly appearance and which cannot sustain itself in a time as dry as summer. Judge, Sir, from my position, to do a badly executed work, to have a continual fever, to go four miles by foot every day in a state of weakness, to lie on straw, to have very little consideration in a country where genius is useless and his profession is that of a mason or regarded as such, to be able to do nothing for the good of the army and to spare the blood of the americans because I fear to displease. I have taken the part of telling the things which press most to be executed through M. du Bois who speaks willingly. Acknowledge, Sir, that one must be born for the general cause of humanity and not have any desire but to see this cause triumph for once, to patiently suffer these annoyances, but also I will die content, if your independence, established under good laws, is secured and makes an example for the rest of the world.

I have learned that M. de Woedke<sup>12</sup> died in Canada . . . . If you wish, Sir, to make me inherit from his rank, the right that I would have to participate in the counsels of war would give me more influence and more right to counsel the better deployments, without having more command responsibility which I do not desire at all, but just more ease which is

necessary to me. I am beginning to speak, be it ever so little, english to make myself understood, I read it perfectly . . . I am not as familiar with the spirit of the american people that I know here, this people is the same everywhere inconstant and flighty, furthermore one needs men of spirit in whom the people will have some confidence who will speak to them from time to time about their duty to their country and of the common cause. Their generals whom they have elected should go see them in their tents to inspire them; the wounded should be visited and almost cared for by the first officers of the army, that is how the patriotic ardor sustains itself which it is necessary to infuse into the low and common souls.

In a country where there is so much ease it will always be difficult for you to have paid armies which you can command, it would be better for you, for a free state, to have an agricultural militia.

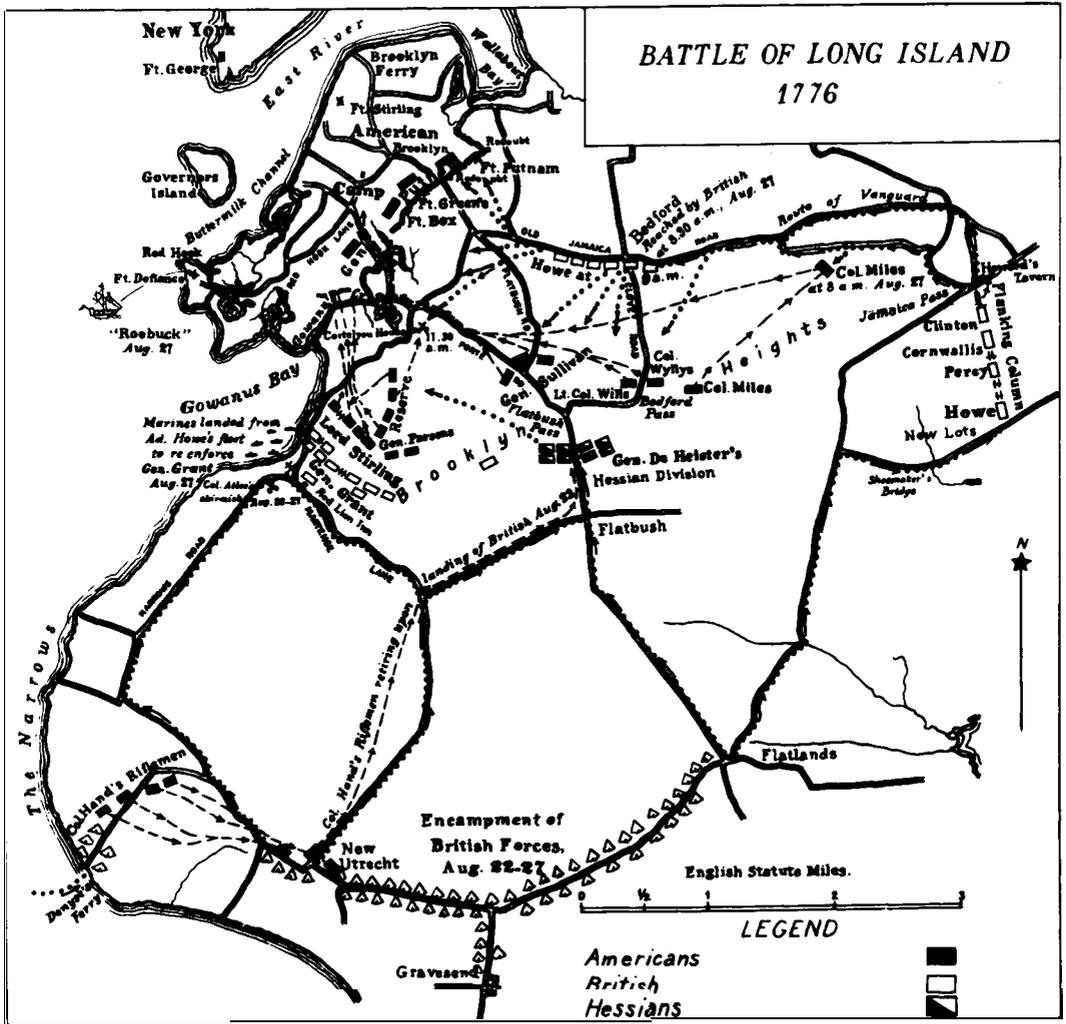
You know better than I do, Sir, that it is dangerous to have troops within your own bosom which are hired, for that is the origin of the corruption of states and morals of a people, for a free state should only have an agricultural militia, that everyone may work on the land and do their duty, and that there are no exemptions except for those who have children which replace them in their old age. . . .

—Butterfield, “An Episode of  
'76,” pp. 40–43. Translated  
by Patricia H. Stablein.

On August 22 Howe finally acted decisively. A large contingent of British troops ferried from Staten Island to Long Island, landing virtually unopposed. The main enemy objective, it now appeared, was Brooklyn; but Washington still feared for Manhattan and accordingly divided his forces between New York and Long Island.

The American position on Long Island that August consisted of a line of five works—Forts Box, Greene, and Putnam, and two unnamed redoubts—connected by breastworks and stretching from Gowanus Bay to Wallabout Bay. Star-shaped Fort Greene, mounting six guns and commanding the American center, was the largest work on the island. Fort Putnam, a star fort, stood on a hilltop and formed the salient point of the American line. Behind the line stood Fort Stirling and Fort Defiance (Red Hook). Fort Stirling commanded the East River channel, and Fort Defiance, originally a battery but improved that summer, overlooked the eastern passage around Governor’s Island. Though specific details are lacking, Rufus Putnam is known from orders issued by Washington to have played a large role in the erection of the Brooklyn works.

Southeast of the American defenses lay a row of heavily forested hills overlooking a broad, open plain. The elevation provided an excellent natural defense that complemented the fortifications behind them. In fact



**BATTLE OF LONG ISLAND, 1776.** One of a series of maps prepared by the Army War College, this map depicts the positions and movements of the American and British armies.  
National Archives

the rebels stationed the bulk of their Long Island forces along the ridge of hills, hoping to cut off a British advance before it reached the American works.

On Long Island Howe's strategy was to divert the American right wing (Gowanus Bay) while personally leading a large force through the Jamaica Pass (where one of four roads crossed the elevation in front of the American line) to attack the weak American left between Forts Greene and Putnam. On the night of August 26 Howe made his move. The next day American resistance on the left collapsed. By midday the British forced the rebels to retreat from their forward positions to a point behind their entrenchments. Their backs against the East River, the rebels awaited the inevitable storming of the lines, another Bunker Hill.

Strong winds and Howe's reluctance to act at Brooklyn as he had at Bunker Hill very probably kept this first open engagement on the battlefield from being the last. The ships commanded by his brother, Admiral Richard Howe, were unable to get behind the American lines where they might have delivered devastating fire. And General Howe, for his part, held back his men from a frontal assault. The risks of such an assault were too great, Howe thought, when it was "apparent that the lines must have been ours at a very cheap rate by regular approaches."<sup>13</sup>

Howe's memory of the murderous rebel musketfire at Bunker Hill undoubtedly influenced his decision. In later defending the general's action, Capt. John Montresor, the chief British engineer in America, said: "They [the American redoubts] could not be taken by assault, but by approaches, as they were fortresses rather than redoubts."<sup>14</sup> Within two days the British constructed their own redoubt several hundred yards from the American left and began regular siege operations.

Washington called a council of war on the 29th to consider withdrawing to New York City. Citing as its reasons the division of the army between New York and Long Island and British control of the waterways, the council unanimously favored retreat. Washington's generals also were apprehensive that their lines would not withstand a frontal attack. Contrary to Montresor's assessment, the council argued: "Tho' our Lines were fortified with some strong Redoubts, yet a Great part of them were weak being only abbatied with Brush, and affording no strong cover."<sup>15</sup>

While he seemed to be planning to reinforce his troops, Washington actually was preparing to retreat. The only way out of Brooklyn was across the East River to Manhattan. The operation would be difficult: more than ten thousand men and considerable stores had to be moved fast to avoid British detection, and it required skilled boatmen to master New York's tricky tides and winds.

Washington was fortunate to have immediately available two units whose experience suited them well for an amphibious operation. On the night of August 29–30 he called on Col. John Glover's 14th Continental Regiment (Marblehead, Massachusetts) and Col. Israel Hutchinson's 27th Continental Regiment (Salem) to man the boats. These units, composed largely of sailors and fishermen,<sup>16</sup> met the challenge well.

Under Washington's careful direction the men of Marblehead and Salem—many of them wearing the blue jackets, white caps and tarred trousers of their trade—ferried the entire American camp in flatboats and sloops across the East River to relative safety on Manhattan. The weather cooperated beautifully. The heavy rain and wind that drenched the American camp, ruined ammunition, and complicated the crossing also kept British ships from moving up the East River to cut off the retreat. The entire operation was completed by seven o'clock the morning of the 30th. Washington had lost the battle but had skillfully kept his army intact.

New York City offered only temporary refuge for Washington's army. Entrapment was again a real possibility, as the only feasible escape route led across a bridge at the northern end of Manhattan Island. Washington asked his generals whether he should attempt to hold New York City. The issue was an emotional one involving more than military considerations. Maj. Gen. Nathaniel Greene, who knew the New York–Long Island terrain best, urged evacuating and burning the city.

Chief Engineer Rufus Putnam surveyed Manhattan for Washington and advised bringing the army together rather than dispersing it throughout the island. In his report to Washington Putnam properly recognized the importance of British naval and numerical superiority. He favored entrenching on Harlem Heights and Mount Washington, thereby abandoning any attempt to hold the city, which then was limited to the southernmost tip of Manhattan Island. Significantly, Putnam saw the defense of the Hudson River and the Highlands above New York and the maintenance of communications as the only reasons for keeping forces on the island.

## 6. PUTNAM RECONNOITERS THE ISLAND OF MANHATTAN

### Rufus Putnam to George Washington.

Bloomingdale, September 3, 1776

Sir: According to your Excellency's order, I have reconnoitered every part about the Island of New-York and the main, as far as Frog's Point, and, on a full view, find the enemy have such a variety of places to choose out of, that it's impossible to prevent their landing when they please. They have such guides and intelligence of our movements that they can always avoid or surprise any parties that are posted to oppose their landing. Their army is so numerous that they can attack any division of our army with a superiour force; and yet, while our army is extended from New-York to King's Bridge, 'tis necessary to have a body of reserve at this place. But I cannot think it would be best, nor have we time, to make fortifications; since the moment any quarter is attacked, the whole body of reserve, I conclude, will be ordered to support it. I should advise the throwing obstructions in the way of landing. That they have one week's provisions always with them, and teams ready to carry their baggage wherever the service requires.

I mentioned to your Excellency that I thought your army should be collected together in some advantageous place, where supplies might be had, and a camp fortified in such a manner as the enemy dare not attack, or, if they did, must be repulsed; and I think so still, if it be possible to effect it. And to defend the passage of the North River, which I take to be the capital object, and at the same time keep open a communication with the

Eastern and Southern Colonies, is to press the army from Bundet landing, on the Jersey shore—Mount Washington and the Heights, south as far as Colonel Thompson's house, on Harlem River—the Heights we now possess at King's Bridge, and as far south as the Three Trees. The batteries on the Jersey side to be filled with guns; the battery on the rocks below Mount Washington completed; a new one built below the hill opposite the sunken vessels. These, well filled with guns and ammunition, if the galleys also afforded their assistance, would render it very difficult for ships to pass. If they attempted to force this post, I think they must be beaten. If they detached into the country on either hand, it must scatter their army in such a manner that your Excellency must drub them. But if supplies cannot be had at this place, at the Highlands they may, both by land and water. I think there has been some proof the ships dare not attempt that passage; but they are not prepared to defend against a landing. This is surely worth attention; for if they possess themselves of this passage, we shall be in a bad box. For my sentiments about that place, I refer your Excellency to Lord Stirling's report last May. I know that this doctrine gives up York to destruction, and exposes many other towns to be ravaged by them. But what are ten or twenty towns to the grand object? If they once pass the Highlands, I see no way to prevent the junction of their armies. Burgoyne need never come from Canada. If Howe gets to Albany, our Northern Army must quit Ticonderoga, or fall a sacrifice.

—Force, *American Archives*, 5th ser., 2:140.

As he pondered evacuating New York City, Washington wrote an extremely revealing letter to Congress. Of particular interest are his comments on fortifications and the defensive nature of the war. At this point he reluctantly conceded the loss of the city but firmly believed that Forts Washington and Lee and the river obstructions would check any advance north by the enemy. Washington's letter helps clarify American strategy in New York and elsewhere.

## 7. "I HAVE NEVER SPARED THE SPADE AND PICK AX"

**George Washington to the President of Congress.**

Headquarters, New York, September 8, 1776

. . . Before the landing of the Enemy on Long Island, the point of Attack could not be known or any satisfactory Judgment formed of their Intentions. It might be on Long Island, on Bergen or directly on the City, this made it necessary to be prepared for each, and has occasioned an Ex-

penance of Labour which now seems useless and is regretted by those who form a Judgment from after Knowledge. But I trust, men of discernment will think differently and see that by such Works and preparations we have not only delayed the Operations of the Campaign, till it is too late to effect any capital Incursion into the Country, but have drawn the Enemy's forces to one point and obliged them to decline their plan, so as to enable us to form our defence on some Certainty. It is now extremely obvious . . . they mean to enclose us on the Island of New York by taking post in our Rear, while the Shipping effectually secure the Front, and thus either by cutting off our communication with the Country, oblige us to fight them on their own Terms, or surrender at discretion, or by a brilliant Stroke endeavour to cut this Army in pieces and secure the Collection of Arms and Stores which they well know we shall not be soon able to replace . . . In deliberating on this Question it was impossible to forget, that History, our own experience, the advice of our ablest Friends in Europe, the fears of the Enemy, and even the Declarations of Congress demonstrate, that on our Side the War should be defensive. It has even been called a War of Posts. That we should on all Occasions avoid a general Action, or put anything to the Risque, unless compelled by a necessity, into which we ought never to be drawn.

The Arguments on which such a System was founded were deemed unanswerable and experience has given her sanction. With these views, and being fully persuaded that it would be presumption to draw out our Young Troops into open ground, against their Superiors both in number and Discipline; I have never spared the Spade and Pick Ax; I confess I have not found that readiness to defend even strong Posts, at all Hazards, which is necessary to derive the greatest benefit from them. The honor of making a brave defence does not seem to be a sufficient stimulus, when the success is very doubtful, and the falling into the Enemy's hands probable. But I doubt not this will be gradually attained. We are now in a strong Post, but not an Impregnable one, nay acknowledged by every man of Judgment to be untenable, unless the Enemy will make the Attack upon Lines, when they can avoid it and their Movements indicate that they mean to do so. To draw the whole Army together in order to arrange the defence proportionate to the extent of Lines and works, would leave the Country open to an Approach and put the fate of this Army and its Stores on the hazard of making a successful defence in the City, or the Issue of an Engagement out of it. On the other hand to abandon a City, which has been by some deemed defensible and on whose Works much Labour has been bestowed, has a tendency to dispirit the Troops and enfeeble our Cause. It has also been considered as the Key to the Northern Country. But as to this I am fully of opinion, that by Establishing of strong posts at Mont Washington on the upper part of this Island and on the Jersey side opposite to it, with the Assistance of the Obstructions already made and which may be improved in the Water, that not only the navigation of Hud-

son's River but an easier and better communication, may be effectually secured between the Northern and Southern States. This I believe every one acquainted with the situation of the Country will readily agree to, and will appear evident to those who have an Opportunity of recurring to good maps. These and the many other consequences, which will be involved in the determination of our next measure, have given our Minds full employ and led every one to form a Judgement, as the various objects presented themselves to his view. The post at Kings Bridge is naturally strong and is pretty well fortified the Heights about it are commanding and might soon be made more so. . . .

. . . I am sensible a retreating Army is incircled with difficulties, that the declaring and Engagement subjects a General to reproach and that the common Cause may be in some measure affected by the discouragements which it be made with any Probability of success, especially after our loss upon Long Island: but when the fate of America may be at stake on the Issue; when the Wisdom of cooler moments and experienced Men have decided that we should protract the War if Possible; I cannot think it safe or wise to adopt a different System, when the season for Action draws so near a close. That the Enemy mean to Winter in New York there can be no doubt; that with such an Armament they can drive us out is equally clear. The Congress having resolved, that it should not be destroyed, nothing seems to remain but to determine the time of their taking Possession.

—Fitzpatrick, *Writings of Washington*, 6:27–29, 31–32.

On 12 September 1776 the council of war agreed that New York could not be held. Washington removed the bulk of his troops to the Harlem Heights,<sup>17</sup> a plateau lying at the upper end of Manhattan between the Harlem River and the Hudson, where he projected a series of three lines of entrenchments. Putnam exercised great responsibility in securing the new American position. Washington ordered his commanding officers “to turn out every man they have off duty, for fatigue, and to apply to Col. Putnam for tools, and directions where and how to work.”<sup>18</sup>

On the 15th, after landing successfully at Kip's Bay, the British seized the entire southern half of Manhattan and barely missed cutting off the retreat of some of Washington's men. They began building their own fortifications. Once again Washington waited for Howe's next move, and once again the British general delayed.

That September a vessel known as the *American Turtle* submerged in New York harbor several times in an effort to attach explosives to British ships. The Americans were trying a new tactic—submarine warfare. David Bushnell, a student at Yale College in the 1770's, had designed and built the

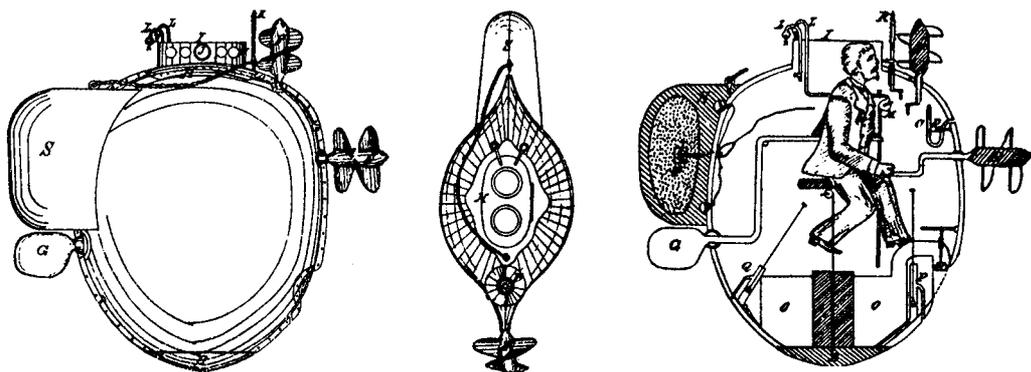
*Turtle* at Saybrook, Connecticut, with the assistance of his brother, Ezra. Bushnell operated on the premise that the force of an explosion under water would *not* dissipate itself harmlessly, a premise he tested in several experiments while at Yale. "They all produced very violent explosions," Bushnell later recalled, "much more than sufficient for any purpose I had in view."<sup>19</sup> Having shown the viability of underwater explosions, he next developed his submarine, believing it to be the best way to convey explosives to a target ship. Finally he designed a powder magazine and a means of attaching it to the target.

In the spring of 1775 the brothers finished their vessel and quickly won support for their idea from Silas Deane, Yale alumnus and Connecticut congressman; Connecticut's Governor Jonathan Trumbull; Maj. Gen. Israel Putnam; and, ultimately, George Washington. Washington agreed to furnish Bushnell "with money and other aids to carry his plan into execution."<sup>20</sup>

An underwater vessel presented many design problems. In addition to a watertight and pressure-resistant hull, the sub needed a reliable steering mechanism, vertical stability, variable ballast, and vertical and horizontal mobility. In a letter to Thomas Jefferson, written in 1787 and read eleven years later at the American Philosophical Society, Bushnell described the *Turtle*, explained his solutions to the problems of underwater warfare, and related how he had first tested his vessel.

## 8. BUSHNELL'S GENERAL PRINCIPLES AND CONSTRUCTION OF A SUBMARINE VESSEL

The external shape of the sub-marine vessel bore some resemblance to two upper tortoise shells of equal size, joined together; the place of en-



SKETCHES OF BUSHNELL'S AMERICAN TURTLE. In the left figure, S indicates the powder magazine, and G the rudder. The propeller-like projections on the side and top are oars for horizontal and vertical movement. R, next to the top oar, is the wood screw.

Abbot, *Modern Submarine Warfare*

trance into the vessel being represented by the opening made by the swell of the shells, at the head of the animal. The inside was capable of containing the operator, and air, sufficient to support him thirty minutes without receiving fresh air. At the bottom opposite to the entrance was fixed a quantity of lead for ballast. At one edge which was directly before the operator, who sat upright, was an oar for rowing forward or backward. At the other edge, was a rudder for steering. An aperture, at the bottom, with its valve, was designed to admit water, for the purpose of descending; and two brass forcing-pumps served to eject the water within, when necessary for ascending. At the top, there was likewise an oar, for ascending or descending, or continuing at any particular depth—A water-gauge or barometer, determined the depth of descent, a compass directed the course, and a ventilator within, supplied the vessel with fresh air, when on the surface.

The entrance into the vessel was elliptical, and so small as barely to admit a person. This entrance was surrounded with a broad elliptical iron band, the lower edge of which was let into the wood of which the body of the vessel was made, in such a manner, as to give its utmost support to the body of the vessel against the pressure of the water. Above the upper edge of this iron band, there was a brass crown, or cover, resembling a hat with its crown and brim, which shut water tight upon the iron band: the crown was hung to the iron band with hinges so as to turn over sidewise, when opened. To make it perfectly secure when shut, it might be screwed down upon the band by the operator, or by a person without.

There were in the brass crown, three round doors, one directly in front, and one on each side, large enough to put the hand through—when open they admitted fresh air; their shutters were ground perfectly tight into their places with emery, hung with hinges and secured in their places when shut. There were likewise several small glass windows in the crown, for looking through, and for admitting light in the day time, with covers to secure them. There were two air pipes in the crown. A ventilator within drew fresh air through one of the air pipes, and discharged it into the lower part of the vessel; the fresh air introduced by the ventilator, expelled the impure light air through the other air pipe. Both air pipes were so constructed, that they shut themselves whenever the water rose near their tops, so that no water could enter through them, and opened themselves immediately after they rose above the water.

The vessel was chiefly ballasted with lead fixed to its bottom; when this was not sufficient, a quantity was placed within, more or less, according to the weight of the operator; its ballast made it so stiff, that there was no danger of oversetting. The vessel with all its appendages, and the operator, was of sufficient weight to settle it very low in the water. About two hundred pounds of the lead, at the bottom, for ballast, would be let down forty or fifty feet below the vessel; this enabled the operator to rise instantly to the surface of the water, in case of accident.

When the operator would descend, he placed his foot upon the top of a brass valve, depressing it, by which he opened a large aperture in the bottom of the vessel, through which the water entered at his pleasure; when he had admitted a sufficient quantity, he descended very gradually; if he admitted too much, he ejected as much as was necessary to obtain an equilibrium, by the two brass forcing pumps, which were placed at each hand. Whenever the vessel leaked, or he would ascend to the surface, he also made use of these forcing pumps. When the skilful operator had obtained an equilibrium, he could row upward, or downward, or continue at any particular depth, with an oar, placed near the top of the vessel, formed upon the principle of the screw, the axis of the oar entering the vessel; by turning the oar one way he raised the vessel, by turning it the other way he depressed it.

A glass tube eighteen inches long, and one inch in diameter, standing upright, its upper end closed, and its lower end, which was open, screwed into a brass pipe, through which the external water had a passage into the glass tube, served as a water-gauge or barometer. There was a piece of cork with phosphorus on it, put into the water-gauge. When the vessel descended the water rose in the water-gauge, condensing the air within, and bearing the cork, with its phosphorus, on its surface. By the light of the phosphorus, the ascent of the water in the gauge was rendered visible, and the depth of the vessel under water ascertained by a graduated line.

An oar, formed upon the principle of the screw, was fixed in the fore-part of the vessel; its axis entered the vessel, and being turned one way, rowed the vessel forward, but being turned the other way rowed it backward; it was made to be turned by the hand or foot.

A rudder, hung to the hinder part of the vessel, commanded it with the greatest ease. The rudder was made very elastic, and might be used for rowing forward. Its tiller was within the vessel, at the operator's right hand, fixed, at a right angle, on an iron rod, which passed through the side of the vessel; the rod had a crank on its outside end, which commanded the rudder, by means of a rod extending from the end of the crank to a kind of tiller, fixed upon the left hand of the rudder. Raising and depressing the first mentioned tiller turned the rudder as the case required.

A compass marked with phosphorus directed the course, both above and under the water; and a line and lead founded the depth when necessary.

The internal shape of the vessel, in every possible section of it, verged towards an ellipsis, as near as the design would allow . . . . The body of the vessel was made exceedingly strong; and to strengthen it as much as possible, a firm piece of wood was framed, parallel to the conjugate diameter, to prevent the sides from yielding to the great pressure of the incumbent water, in a deep immersion. This piece of wood was also a seat for the operator.

Every opening was well secured. The pumps had two sets of valves. The aperture at the bottom, for admitting water, was covered with a plate, perforated full of holes to receive the water, and prevent any thing from choaking the passage, or stopping the valve from shutting. The brass valve might likewise be forced into its place with a screw, if necessary. The air pipes had a kind of hollow sphere, fixed round the top of each, to secure the air-pipe valves from injury: these hollow spheres were perforated full of holes for the passage of the air through the pipes: within the air-pipes were shutters to secure them, should any accident happen to the pipes, or the valves on their tops.

Wherever the external apparatus passed through the body of the vessel, the joints were round, and formed by brass pipes, which were driven into the wood of the vessel, the holes through the pipes were very exactly made, and the iron rods, which passed through them, were turned in a lathe to fit them; the joints were also kept full of oil, to prevent rust and leaking. Particular attention was given to bring every part, necessary for performing the operations, both within and without the vessel, before the operator, and as conveniently as could be devised; so that every thing might be found in the dark, except the water-gauge and the compass, which were visible by the light of the phosphorus, and nothing required the operator to turn to the right hand, or to the left, to perform any thing necessary. . . .

*Description of a magazine and its appendages, designed to be conveyed by the sub-marine vessel to the bottom of the ship.* In the forepart of the brim of the crown of the submarine vessel, was a socket, and an iron tube, passing through the socket; the tube stood upright, and could slide up and down in the socket, six inches: at the top of the tube, was a wood-screw . . . fixed by means of a rod, which passed through the tube, and screwed the wood-screw fast upon the top of the tube: by pushing the wood-screw up against the bottom of a ship, and turning it at the same time, it would enter the planks; driving would also answer the same purpose; when the wood-screw was firmly fixed, it could be cast off by unscrewing the rod, which fastened it upon the top of the tube.

Behind the sub-marine vessel, was a place, above the rudder, for carrying a large powder magazine, this was made of two pieces of oak timber, large enough when hollowed out to contain one hundred and fifty pounds of powder, with the apparatus used in firing it, and was secured in its place by a screw, turned by the operator. A strong piece of rope extended from the magazine to the wood-screw . . . above mentioned, and was fastened to both. When the wood-screw was fixed, and to be cast off from its tube, the magazine was to be cast off likewise by unscrewing it, leaving it hanging to the wood-screw; it was lighter than the water, that it might rise up against the object, to which the wood-screw and itself were fastened.

Within the magazine was an apparatus, constructed to run any proposed length of time, under twelve hours; when it had run out its time, it

unpinioned a strong lock resembling a gun lock, which gave fire to the powder. This apparatus was so pinioned, that it could not possibly move, till, by casting off the magazine from the vessel, it was set in motion.

The skilful operator could swim so low on the surface of the water, as to approach very near a ship, in the night, without fear of being discovered, and might, if he chose, approach the stem or stern above water, with very little danger. He could sink very quickly, keep at any depth he pleased, and row a great distance in any direction he desired, without coming to the surface, and when he rose to the surface, he could soon obtain a fresh supply of air, when, if necessary, he might descend again, and pursue his course. . . .

In the first essays with the sub-marine vessel, I took care to prove its strength to sustain the great pressure of the incumbent water, when sunk deep, before I trusted any person to descend much below the surface: and I never suffered any person to go under water, without having a strong piece of rigging made fast to it, until I found him well acquainted with the operations necessary for his safety. After that, I made him descend and continue at particular depths, without rising or sinking, row by the compass, approach a vessel, go under her, and fix the *wood-screw* . . . into her bottom, etc., until I thought him sufficiently expert to put my design into execution.

I found, agreeably to my expectations, that it required many trials to make a person of common ingenuity, a skilful operator . . . .

—*Transactions of the American Philosophical Society*,  
4:303–09.

The Bushnells had planned to use the *Turtle* in Boston, but mechanical problems and the need to keep the operator in constant training delayed them more than a year. Then on the night of 6 September 1776 the *Turtle* made its debut in New York harbor. Sgt. Ezra Lee of the 10th Continental Regiment, an untrained substitute for Ezra Bushnell, piloted the sub alongside Admiral Howe's 64-gun *Eagle* but was unable to screw the powder magazine into the enemy vessel because of an iron plate passing from the *Eagle's* rudder hinge and spiked under the ship's quarter. Lee vividly recounted his experience in a letter written nearly forty years later to David Humphreys, a biographer of Maj. Gen. Israel Putnam.

As described by Lee, his task must have been exhausting. He was constantly pedaling and cranking, pumping water from the ballast tank, worrying about detection, surfacing and submerging again, and all the while fighting New York's tricky currents and an ebb tide. In his letter to Jefferson, Bushnell correctly emphasized the need for a skillful operator, but he might also have shown greater appreciation for the sheer strength required.

## 9. "I THOUGHT THE BEST GENERALSHIP WAS TO RETREAT AS FAST AS I COULD"

**Ezra Lee to David Humphreys.**

Lyme [Conn.] 20th Feb'y, 1815

. . . The first night after we got down to New York with it that was favourable (for the time for a trial must be when it is slack water and calm, as it is unmanagable in a swell or a strong tide) the British fleet lay a little above Staten Island. We set off from the city: the whale boats towed me as nigh the ships as they dared to go and then case me off. I soon found that it was too early in the tide, as it carried me down by the ships. I however hove about and rowed for 5 glasses by the ships' bells before the tide slacked, so that I could get alongside of the man of war which lay above the transports. The moon was about 2 hours high, and the daylight about one. When I rowed under the stern of the ship I could see the men on deck and hear them talk. I then shut down all the doors, sunk down and came under the bottom of the ship. Up with the screw against the bottom but found that it would not enter. I pulled along to try another place, but deviated a little one side and immediately rose with great velocity and come above the surface 2 or 3 feet between the ship and the daylight, then sunk again like a porpoise. I hove about to try again, but on further thought I gave out, knowing that as soon as it was light the ships' boats would be rowing in all directions, and I thought the best generalship was to retreat as fast as I could, as I had 4 miles to go before passing Governor's Island. So I jogg'd on as fast as I could, and my compass being then of no use to me, I was obliged to rise up every few minutes to see that I sailed in the right direction, and for this purpose keeping the machine on the surface of the water and the doors open. I was much afraid of getting aground on the island, as the tide of the flood set on the north point.

While on my passage up to the city, my course, owing to the above circumstances, was very crooked and zigzag, and the enemy's attention was drawn towards me from Governor's Island. When I was abreast of the fort on the Island, 3 or 400 men got upon the parapet to observe me; at length a number came down to the shore, shoved off a 12 oar'd barge with 5 or 6 sitters and pulled for me. I eyed them, and when they had got within 50 or 60 yards of me I let loose the magazine in hopes that if they should take me they would likewise pick up the magazine, and then we should all be blown up together. But as kind Providence would have it, they took fright, and returned to the island to my infinite joy. I then weathered the Island, and our people seeing me, came off with a whale boat and towed me in. The magazine, after getting a little past the Island, went off with a tremendous explosion, throwing up large bodies of water to an immense height. . . .

—Johnston, "Sergeant Lee's  
Experience," pp. 264–65.

A week later a second try on the *Eagle* proved fruitless, as did a subsequent attempt on a British frigate. Despite these failures, Bushnell earned himself the title "father of submarine warfare."

Advancing enemy control of Manhattan and the surrounding waters, coupled with the continuing problem of currents, made further submarine efforts too risky. Bushnell tried to transport the *Turtle* back to Connecticut on board a sloop; but the British discovered him, and with a few well-placed cannonballs sank the vessel and its precious cargo. Though he later recovered the sub, Bushnell never used it again because of his own poor health, a lack of funds, and the lengthy training period required for operators. Washington later said of Bushnell's venture: "It was an effort of genius, but . . . too many things were necessary to be combined to expect much from the issue against an enemy who are always upon guard."<sup>21</sup> In 1777 Bushnell made two other attempts at utilizing explosives in the water but did not employ a submarine. His proven ingenuity won him the hearty endorsement of Governor Trumbull for the companies of sappers and miners,<sup>22</sup> which he joined in 1779.

By mid-October 1776 the Americans seemed about to be cut off from behind by one of Howe's favorite flanking movements. In a now-familiar pattern, Washington moved his men still further north, this time to White Plains in Westchester County. Washington left a garrison behind at Fort Washington to defend the line of obstructions stretching across the Hudson from Fort Lee, New Jersey.

When he moved to White Plains Washington needed to know what the enemy was doing. He ordered his Chief Engineer to find out. Putnam had conducted surveys and reconnaissance missions before, although seldom under such dangerous circumstances. Putnam described this particular assignment in an excerpt from his memoirs. When he stole into White Plains itself on October 20, Putnam recalled in another passage, "I was induced to disguise my self by takeing out my cockade, Loping my hat and Secreating my Sword and pistols under my Loose coat, and then had I ben taken under this disguise the probability is that I Should have ben hanged for a Spy."<sup>23</sup>

#### 10. "I . . . DISGUISED MY APPERENCE AS AN OFFICER AS FAR AS I COULD"

**From Rufus Putnam's memoirs.**

*October 19th 1776*—The British Landed on Pells point and Some Skirmishing to[ok] place in the afternoon. . . . The next morning by ordor of the general I Set out from Kingsbridge, to reconnoiter there Position, etc. I Set out in company with Colo. Reed the adjutant general and a foot guard of about 20 men. When we arrived on the hights of East Chester we Saw a Small body of British neer the church, but we could obtain no intillgence, the Houses were diserted.

Colo. Reed now told me he must return to attend issuing general orders. I observed that we had made no discovery yet of any consequence, that if he went back I wished him to take the guard back for I chose to go alone.

I then disguised my apperence as an officer as far as I could, and Set out on the road to White plains. However, I did not then know where White plains was, nor where the road I had taken would carry me. I had gon about 1 ½ mile, when a road turned off to the right, I followed it prehaps ½ a mile and came to a house, where I lerned from the woman that this road Lead to New-Rochell that the British were there and that they had a guard at a house in Sight. On this information I turned and pursued my rout toward White plains (the houses on the way all deserted) untill I came with 3 or 4 mile of the place. Here I discovered a House a little a head with men about it by my glass I found they were not British Soldiers, however I approached them with caution. I called for Some oats for my horse, Set down and heard there chat Some little time, when I found they were frinds to the cause of America and then I began to make the necessary enquieries—and on the whol I found that the main body of the Brittish Lay near New Rochelle. From thence to White plains about nine mile, good roads and in general level open country that at white plains was a large quantity of Stores, with only about three hundred melitia to guard them, that the British had a detachment at Maniarneck only Six miles from White plains, and from White plains only five mile to the North River, where lay five or Six of the enimies Ships and Slops, tenders, etc.

Having made these discoveries I Set out on my return. The road from Wards acros the Brunx was my intended rout unless I found the Brittish there, which happly they were not, but I Saw American on the hights west of the Brunx, who had arrived there after I passed up.—I found it to be Lord Sterlings Division. It was now after Sunset. I gave My Lord a short acctont of my disoveries took Some refreshment, and Set off For head quarters, by the way of Philips, at the mouth of Sawmill river, a road I had never traveled, among tory inhabitence and in the night. I dare not enquire the way, but providence conducted me.—I arrived at head Quarter near Kings bridge (a distence of about 10 mile) about nine oClock at night. I found the General alone. I reported to him the discoveries I had made, with a Sketch of the country. He complained very fealingly of the Gentlemen from New York from whome he had never ben able to obtain a plan of the country—that from there information he had ordored the stores to White plains as a place of Security.—The General Sent for General Greene, and genl. George Clinton. . . . As Soon as General Clinton came in my [s]ketch and Statement was Shewn to him and he was asked if the Sittuation of those places were as I had reported.—Genl. Clinton Said they were.

—Buell, *Memoirs`of Putnam*, pp.  
61–63.

Howe characteristically delayed attacking, giving Putnam the opportunity several days later to entrench on Chatterton Hill overlooking White Plains. On the 28th of October the British finally took Putnam's earthworks, while Washington slipped away to North Castle and hastily erected new works.<sup>24</sup> "These, to the enemy, in whose view they fully were," recalled Maj. Gen. William Heath, "must have appeared very formidable, although they were designed principally for small-arms."<sup>25</sup> Heath further described the latest American defenses:

There were the stocks of a large cornfield at the spot: the pulling these up in hills, took up a large lump of earth with each. The roots of the stalks and earth on them, placed in the face of the works, answered the purpose of sods or fascines: the tops being placed inwards as the loose earth was thrown upon them, became as so many ties to the work, which was carried up with a dispatch scarcely conceivable.<sup>26</sup>

As Chief Engineer, Putnam assisted again by "examining the nature of the country in a military point of view."<sup>27</sup> For whatever reasons—and the formidable appearance of the rebel position surely was one—Howe failed to attack Washington's new position, decamped, and marched southwest. Isolated Fort Washington was his goal.

Throughout November Washington maintained the post at Fort Washington largely on assurances from General Greene that it could be held and, if necessary, safely evacuated. For their part the British assumed the fort to be strong. Their decision to take it was based on reports of dissension among the troops and not on any perceived weakness of the position.<sup>28</sup>

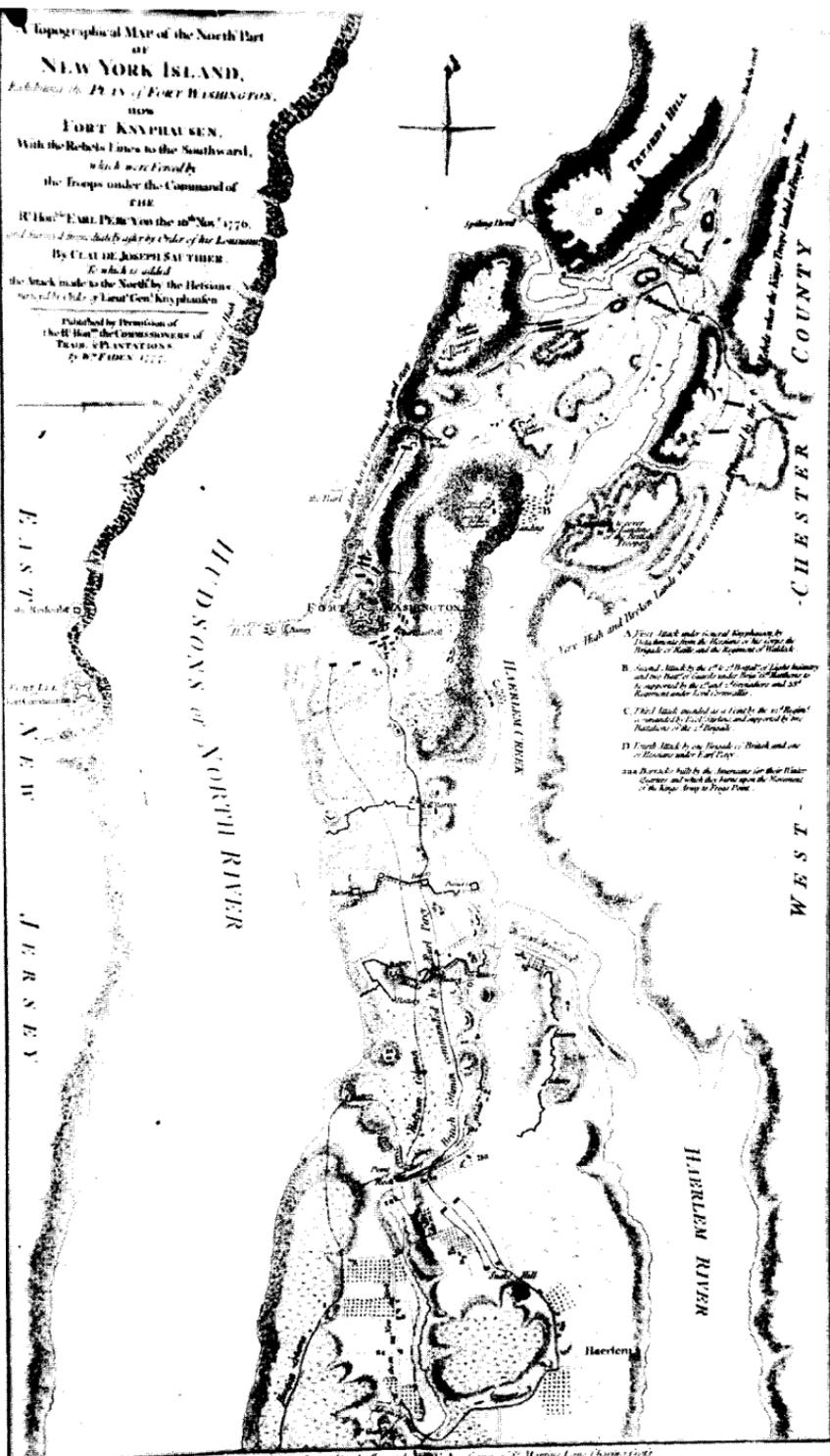
Appearances were deceiving. Though located on a bed of rock nearly 200 feet above the Hudson, Fort Washington was actually rather weak. In July Putnam had laid out the fort and directed its construction but made no effort to strengthen the position by blasting the underlying rock. The main fort was a five-sided earthwork lacking a fraise, ditch, barracks, casements, and a well. Moreover, the outworks were incomplete and the citadel could easily be besieged. The fort and surrounding batteries mounted thirty-four cannon and a pair of howitzers.

A series of earthworks protected Fort Washington to the south where an infantry approach was easiest. Additional redoubts lay to the north and east. Another redoubt at Jeffery's Hook, planned by Antoine Felix Wuibert de Mézières, a French volunteer serving as an Army engineer, defended the western edge of the position.<sup>29</sup> If the outworks fell, the rebels planned to retreat to the main fort as a last resort.

*NORTHERN MANHATTAN ISLAND, NOVEMBER 1776. This British plan of the American position around Fort Washington, center, and the route of the Hessian attack shows that south of the main fort were extensive batteries, surrounded by abatis, and the rebels' winter barracks.*

Courtesy New-York Historical Society, New York City

Topographical Map of the North Part  
 of  
**NEW YORK ISLAND,**  
 Exhibiting the **PLANS** of **FORT WASHINGTON,**  
 now  
**FORT KNIPSCHAUSEN,**  
 With the Rebel Lines to the Southward,  
 which were *Fixed* by  
 the Troops under the Command of  
**THE**  
**RICHD<sup>d</sup> EARL PIERCE** on the 10<sup>th</sup> Nov. 1776,  
 and various other *Sketches* by Order of the *Commander*  
 By **CLAUDE JOSEPH SAUTHER,**  
*to which is added*  
 the Attack made to the North by the Hessians  
 on the 26<sup>th</sup> of Dec. 1776, by *Genl. Mifflin*  
 Published by Permission of  
 the Hon<sup>ble</sup> the COMMISSIONERS of  
 THE LAND OFFICE  
 in 1787.



- A First Attack made in several Places by the Hessians from the Heights of the City to the Heights of Mifflin and the Heights of Harlem.
- B Second Attack by the 11<sup>th</sup> of Dec. of Light Infantry and two Regts of Cavalry under Genl. Mifflin, supported by the 22<sup>d</sup> of Grenadiers and 20<sup>th</sup> of Mifflin's under Lord Cornwallis.
- C Third Attack made on a March by the 22<sup>d</sup> of Mifflin's on the 26<sup>th</sup> of Dec. 1776, and supported by the Hessians on the 27<sup>th</sup> of Dec.
- D Fourth Attack by my Friends of Dutch and on 27<sup>th</sup> December under Fort Mifflin.
- 2224 The attack made by the Hessians on the 26<sup>th</sup> of Dec. 1776, and which they have upon the Heights of the Kings Bridge to the River.

Near dawn on 16 November 1776 Washington crossed the Hudson from Fort Lee with Generals Israel Putnam, Nathaniel Greene, and Hugh Mercer, to decide the fate of Fort Washington once and for all. The British were known to be advancing toward the fort, but upon landing the generals learned that Hessians were at that moment attacking the outer lines. Fearing for their safety, the officers returned to Fort Lee and awaited the outcome. Before nightfall Col. Robert Magaw, commander at Fort Washington, surrendered. The British took valuable materiel and more than 2,800 prisoners, among them engineer Wuibert.

By November 20 the British controlled Fort Lee as well. Closely pursued by Lord Cornwallis, Washington's army began a retreat across New Jersey that ultimately led over the Delaware River at Trenton into Pennsylvania. The loss of entrenching tools at Fort Washington prohibited construction of earthworks. Nevertheless, Washington's men placed obstructions in the path of the British and destroyed bridges wherever possible. And before Washington crossed into Pennsylvania, he ordered all boats in the vicinity gathered up in an effort to hinder Cornwallis's pursuit.

Though it was nearly winter, Washington was not content to end the campaign of 1776. The loss of Fort Washington haunted him, and he feared British designs on Philadelphia, not to mention sagging patriot morale. Accordingly Washington planned a bold move to retake western New Jersey by coordinated surprise attacks on British positions at Trenton and Bordentown, outposts Cornwallis had established earlier in December before going into winter quarters at New Brunswick.

Christmas night Washington again called on Glover's Marbleheaders, this time to ferry the 2,400 men in his main force across the Delaware at McKonkey's Ferry north of Trenton. Glover's task was a difficult one, the river being choked with ice. Worse still, winds battered the area and a blinding snowstorm developed before morning. Glover's experienced sailors and fishermen manned Durham boats—black river vessels resembling large canoes. Eighteen-foot oars propelled the boats downstream, while the oarsmen used poles to move upstream. The amphibious operation was a remarkable success, particularly in the movement of eighteen heavy artillery pieces without loss. (Two simultaneous attempts to cross farther downriver failed, in one case because the artillery was too heavy.)

Though aiming for midnight, Glover's men understandably completed the crossing three hours late. The Marbleheaders then joined the rest of Glover's brigade to march the nine miles to Trenton with Washington. There the rebels surprised and overwhelmed the poorly entrenched Hessian garrison. By helping to cut off the enemy's retreat, Glover's men proved their ability on land as well as on water.

On the night of the 26th, the weary Marbleheaders ferried about 950 Hessian prisoners and the victorious American forces back to the Pennsylvania side of the river. Weather conditions that night were even worse. When the operation was over, Glover's men collapsed from exhaustion.

Washington's troops and artillery crossed the ice-jammed Delaware to New Jersey again on December 30 and 31. This time Washington hoped to solidify his position at Trenton and drive the British farther east. At first he massed his army at Trenton and placed earthworks along the Assunpink Creek and north of the town. Cornwallis, boasting that he would soon "bag the fox," moved into Trenton. But on the night of 2-3 January 1777, Washington left his campfires burning and stole toward Princeton, where the next morning he surprised the enemy and gained control of the town.

Although Washington wanted to go on to New Brunswick, his men were too tired. Sorely disappointed at his inability to take action he felt might have ended the war, Washington established winter quarters at Morristown. He was heartened, however, that his bold actions had breathed new life into the American cause. By the 10th, Howe had withdrawn all his troops to New Brunswick and Amboy. The campaign of 1776 was over.

The patriots lost New York in 1776 but still held Philadelphia. For how long no one could be sure. Enemy control of New York City made security of the Hudson Highlands upriver an American priority. For the remainder of the war, Washington dreamed of retaking New York. He never succeeded.

