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Source: *Military Affairs*, Vol. 20, No. 1 (Spring, 1956), pp. 1-15

Published by: Society for Military History

Stable URL: <http://www.jstor.org/stable/1982625>

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GUNS OF DESTINY

Field Artillery in the Trenton-Princeton Campaign
25 December 1776 to 3 January 1777

By JAC WELLER*

IN WASHINGTON'S own words, "The game was pretty nearly up," as Christmas approached in 1776. He and his Continental Army had been driven from Long Island, Manhattan Island, a good deal of lower New York state and finally across New Jersey into Pennsylvania. The army had shown itself lacking in discipline and efficiency, to say the very least. Many were loud in their condemnation of its commander. The forces available to oppose about 30,000 British and Hessian professionals in the New York theatre of operations had shrunk from 25,000 to less than 8,000. Only about half of these were with Washington on the Pennsylvania side of the Delaware. The condition of the soldiers who remained was pitiable: Shoes and blankets were in short supply, food was poor and scanty, and all tents had been lost. Worst of all, most of these men would be going home at the end of the year, their term of enlistment completed. The Loyalists were jubilant and, conversely, Whig sentiment had never been so pessimistic.

Somehow, mostly from within himself, Washington found the power and the courage to strike back. His famous counter punches at Trenton and Princeton restored alike the military and the political situations.

**Editorial Note:* Readers will recall Jac Weller as the author of the outstanding study on "The Logistics of Nathan Bedford Forrest," in *Military Affairs*, XVII, 4 (Winter, 1953). In addition to the works specifically cited in the footnotes, he found the following secondary sources useful: Robert G. Albion, *Introduction to Military History* (New York, 1929); Benson J. Lossing, *The Pictorial Field Book of the American Revolution* (New York, 1850-52); Leonard Lundin, *Cockpit of the Revolution* (Princeton, 1940); and Thomas J. Wertenbaker, *The Battle of Princeton* (Princeton, 1922).

This campaign was his first real success. Frederick the Great is said to have placed it among the best of all time. The two battles, essentially small in themselves, yielded tremendous results. The British were practically thrown out of New Jersey. For the first time, Washington took his ultimately victorious strategic position facing the British in New York. His center was at Morristown behind the unassailable defenses at Middlebrook. One flank stretched to the Highlands of the Hudson; the other flank was anchored in the strong Whig territory around Philadelphia and to the South.

The part played by the field artillery in this campaign, in these ten days which changed the fate of the new country, is very great indeed. Essentially, as in all other actions, Washington's whole team, rather than individual members of it, deserves praise; however, Knox's gunners and their pieces contributed far more than their share to these successes. At Trenton when the shoulder firearms of both sides were rendered silent by wet pans, priming and frizzens, the field pieces bore almost the whole of the fire fight. The artillery was the bad-weather arm of the Revolution. The Hessian guns fired only a few rounds; Knox's were in action from beginning to end. The proportion of number of pieces to 1,000 infantry was at least three times that normal in the eighteenth century.

For a week following the battle at Trenton, both armies moved around indecisively. By 2 January 1777, however, Cornwallis had at Princeton close to 8,000 regulars. These

advanced at daybreak towards Trenton where Washington had assembled his army. Two field guns were essential to Washington for a series of holding actions on the road; four more were used in an earthwork at the edge of town. The entire Continental artillery was in action in throwing back the British attack across the Assunpink after they had taken most of Trenton. Knox's fire at dusk from the heights to the south was the heaviest ever delivered on any field anywhere in the Western Hemisphere until that time. This whole "Second Battle of Trenton" was more important than is usually realized.

That night Washington slipped quietly away to his right out of a critical position by a march around Cornwallis's main army; he met a secondary British force at Princeton. For a short interval of time the fate of the young nation hung by a thread. Washington and the Continental Army were on the verge of defeat. Two field pieces of Moulder's battery posted near the Thomas Clarke house held up the victorious British attack and gave time for our more numerous forces to rally under Washington's heroic example, and then win overwhelmingly.

The Colonies, from Massachusetts to Georgia, had a number of artillery pieces at every important port. These were in permanent installations for use mainly against European enemies. Some of the inland fortifications had artillery; but these were fixed rather than mobile. Field pieces which travelled along with an army were almost unknown in America before the Revolution. One of the causes of Braddock's fiasco was his insistence upon taking along several howitzers and field guns which required a road to be cut through the wilderness.¹ Wolfe won his great battle for the British

and Americans against the French on the plains of Abraham outside of Quebec assisted by only one piece of field artillery.² The Colonial roads were so bad that even small field guns were handicaps to troop movements. Few areas were sufficiently clear to give reasonable fields of fire.

Nevertheless, at several places in the Colonies a gunnery tradition existed. The Ancient and Honorable Artillery Company in Boston was organized in 1637, and seems to have been of political and social as well as military importance.³ They had a well trained and equipped unit of field artillery — perhaps the only one in the Colonies, and they were also something of a military academy. The Company received instruction from a British artillery command that remained in Boston throughout the winter of 1766-67.⁴ At the opening of the Revolution, they had three brass 3-pounders of the very latest design. This organization had been in action with the Royal Artillery against Louisburg in 1745, although at that time they were mainly handling siege guns.⁵

There were other groups of colonials who knew a good deal about handling the guns they had in their fortifications. Moultrie's artillery on Sullivan's Island certainly did a superb job against the British Navy at Charleston in 1775.⁶ Both Charleston and Philadelphia had some trained artillerymen,⁷ and some of the latter performed well in Fort Mifflin on the Delaware in 1777.

²Graham, p. 17.

³Albert Manucy, *Artillery through the Ages* (Washington, 1949) p. 10; *passim*, the charter was dated 1638; hereafter Manucy.

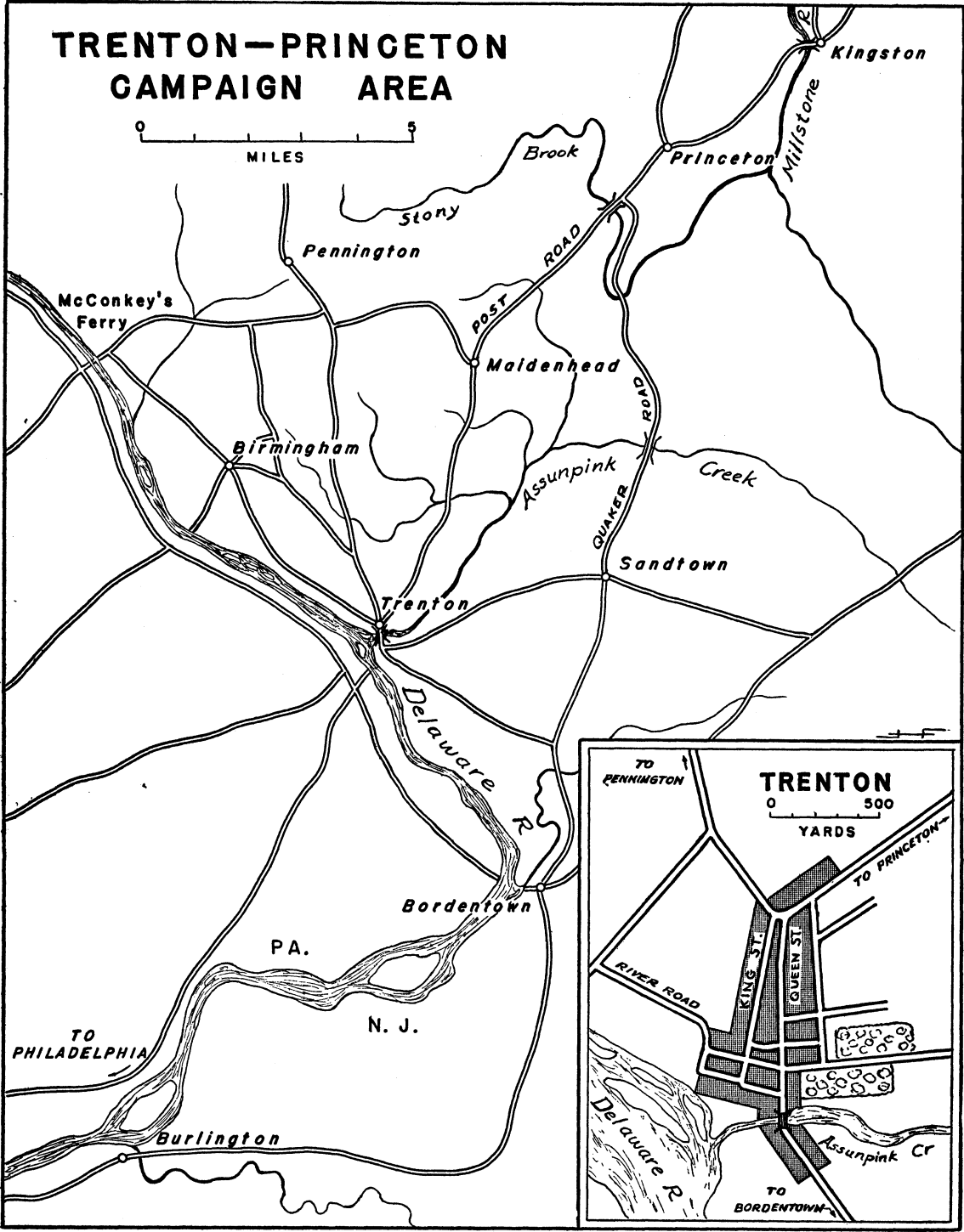
⁴Francis I. Drake, *Life and Correspondence of Henry Knox* (Boston, 1873) p. 126; hereafter, Drake.

⁵Manucy, p. 9; William E. Birkhimer, *History of the Organization, Administration, Materiel and Tactics of the Artillery* (Washington, D. C., 1884), p. 1; hereafter, Birkhimer.

⁶J. W. Fortescue, *A History of the British Army*, XIII Vols. (London, 1915) III, 183; hereafter, Fortescue.

⁷Birkhimer, p. 1.

¹C. A. L. Graham, *The Story of the Royal Regiment of Artillery* (Woolwich, 1944) p. 13; hereafter, Graham. Douglas S. Freeman, *George Washington*, II, 64-65; hereafter Freeman.



Gridley's Continental artillery regiment was organized outside Boston in the spring of 1775, in large part from the Whig personnel of the Boston artillery units.⁸ This first organization proved to be unsatisfactory because of ineffectual leadership and nepotism both in camp and at Bunker Hill, where it lost five of its six pieces and had one of its majors dismissed from the service for misconduct.⁹ It was reorganized during the following winter under the command of young Henry Knox as Colonel. Knox is one of the outstanding men in our entire military history. Knox and Nathanael Greene, although both young and with no active campaigning behind them at the start of hostilities, had studied the military arts extensively, especially those branches pertaining to artillery and fortifications.¹⁰ Knox was familiar with British artillery theory and practice. Under him, the Continental artillery immediately began to function in a manner second to no other arm in the army. The Continental artillery was patterned on the Royal Artillery; it was consistently good throughout the Revolution. It occasionally achieved real greatness, particularly during the short campaign under discussion. In November of 1776, Congress authorized enlarging the artillery to five battalions of twelve companies each. Knox was made a brigadier general of artillery on 27 December 1776, even before the Continental Congress heard of the remarkable contributions he and his gunners made to the victory at Trenton.

CONTINENTAL ARTILLERY MATÉRIEL

Initially, the Continental artillery was forced to use any piece available. Knox was never able to achieve complete uniformity,

⁸Paddock's Artillery Company probably furnished more trained men than the Ancient and Honorable Artillery Company. Both from Boston; Drake, p. 126.

⁹Major Scarborough Gridley, Birkhimer, p. 2.

¹⁰Noah Brooks in *Henry Knox: A Soldier of the Revolution*, quotes a letter from Miss Dorothy Dudley to Miss Esther Livingston, 19 April 1776, p. 34, and *passim*.

even in his field guns. By the end of November of 1776, however, the guns and howitzers that remained with the army were probably the best of a far larger initial armament. None was lost during the retreat across New Jersey. British brass 3-pounders and 6-pounders of the type designed by the great John Muller about 1755 were the most desirable guns; the Muller 5.5-inch howitzer was the best in its class.¹¹ However, some of the pieces in action at Trenton and Princeton were of iron. At least one battery was equipped with French 4-pounders.

French artillery matériel used in the Continental service is most interesting. It began to arrive in the fall of 1776, more than a year before the French declaration of war on Great Britain; the famous Silas Deane was able to do a tremendous lot for us in Paris during 1776.¹² The French field pieces in this country were mounted in British (or Muller) type bracket carriages.¹³ Since the axles were of wood, these could be fabricated locally in accordance with Muller's *Treatise* which was the only source of such information available in the Colonies.¹⁴

In addition to the three types of guns and one howitzer known to be in the Continental Army during this campaign, there were at least two additional types of guns and one additional type of howitzer in use by the British forces. The Royal Artillery which formed a part of Cornwallis's force on 2 January 1771, had four light 12-pounder guns.¹⁵ The Hessian force in Trenton on 26 December 1776, had six brass Hessian 3-pounder guns. These were entirely different

¹¹Knox to Washington and Congress, 1 February 1777; Birkhimer, p. 5.

¹²*Encyclopedia Britannica*, 14th Edition, vol. 7, p. 107; Fortescue, III, 199, says 250 pieces of artillery in 1776.

¹³Harry C. Larter, Jr., "Matériel of the First American Light Artillery," *Military Collector and Historian*, September, 1952, p. 55.

¹⁴Birkhimer, pp. 223-26.

¹⁵William S. Stryker, *The Battles of Trenton and Princeton* (Boston, 1898), p. 248; hereafter, Stryker.

from the Muller type 3-pounders; they were not only larger in bore than the British 3-pounders, but also larger than the French 4-pounders.¹⁶ One of these, later recaptured by the British at Brandywine, had been re-bored by the Continentals to a standard 6-pounder.¹⁷ This extreme confusion was occasioned in part by European "pounds" and "inches" differing radically from one country to another before the almost universal adoption of the metric system. Another source of variation was the amount of "windage"—the difference between minimum bore and maximum shot diameter—used in different countries.

There was probably a "32-pounder" howitzer in the earthworks hastily thrown up at head of Nassau Street in Princeton.¹⁸ Both the bores and designations of howitzers during the Revolution are open to considerable question. These weapons ordinarily did not fire round shot; canister and grape were their

normal projectiles. They did fire shell during the campaign in question;¹⁹ however, extra windage would not have been a great disadvantage for howitzer type fire.²⁰ The British nomenclature for their howitzers stated nominal bore diameter in inches, but a projectile weight designation was not unknown. A howitzer cast in Philadelphia for the Continental Army in 1775 was called a 5.5-inch piece; conceivably, it could have been known as a "24-pounder."

A table is shown below giving principal dimensions and data of all the field pieces known to have been used by both sides in this campaign. It should be borne in mind that this was in the days before interchangeability of parts. Considerable variation was inevitable.²¹ Pieces, nominally of the same type, might be different in appearance and in some cases even in important dimensions.²² The tabulations shown are those normal for the pieces in question.²³

	<i>I n I n c h e s</i>		<i>I n P o u n d s</i>			<i>Horses Normally Required</i>
	<i>Diameter of Bore</i>	<i>Length of Piece Less Cascabel</i>	<i>Diameter of Shot</i>	<i>Weight of Tube</i>	<i>Weight of Carriage</i>	
<i>British Type Guns</i>						
3-Pdr.	3.00	46.0	2.90	300	350	1
6-Pdr.	3.67	55.5	3.50	600	700	2
12-Pdr. Light	4.60	58.0	4.40	900	850	3
<i>British Type Howitzers</i>						
5.5-Inch	5.6	28.0	—	475	750	2
6-Inch	6.5	32.5	—	700	950	3
<i>Hessian Guns</i>						
3-Pdr.	3.52	52.0	3.40	450	450	2
<i>French Guns</i> ²⁴						
4-Pdr. New	3.31	58.0	3.20	700	700	2
4-Pdr. Old	3.31	78.0	3.20	900	800	3

¹⁶According to DeTousard, Prussian 3-pounders had a bore of 3.52 English inches, whereas the English 3-pounder had a bore of about 3.00 inches; the French 4-pounder had a bore of 3.31 English inches, and the English and American 6-pounder a bore of 3.67 inches.

¹⁷*Letters of Major Baurmeister to Colonel Von Jungkenn, 1777-1778*, edited by Bernard A. Uhlendorf and Edna Vosper (Philadelphia, 1937), p. 17; hereafter, Baurmeister.

¹⁸Stryker, p. 291.

¹⁹Knox to Mrs. Knox, 28 December 1776; in all matters relating to artillery matériel Knox's statements have been followed.

²⁰The bore diameter of a surviving British Revolutionary howitzer in Yorktown today is 6.8 inches; it was nominally a 6-inch howitzer.

²¹Eight French 4-pounders, all of the same nominal type, presently at Washington's Headquarters at Newburgh, New York, varied in weight from 622 to 662 French pounds when completed, according to their original markings.

²²There were at least four types of brass 3-pounders in the British service at the same time, weighing from 200 to almost 400 pounds; Louis DeTousard, *Artillerist's Companion* (Philadelphia, 1809), II, 201; hereafter, DeTousard.

As has been intimated, the Muller type carriage was used exclusively by both sides, save for the Hessian guns. Muller's *Treatise*, so very important during the war and in the study of it, shows two types of wheeled field carriages. Both used used in this campaign. The bracket type, where the members holding the trunnions are separate heavy planks forming both the cheeks and the trail was most common. These two members are connected by three brackets, or transoms, and the wooden axle; there is usually an obtuse angle downward about half way back. This type of carriage required a limber.

A good deal more is known of the Muller type Continental carriages than of the various limbers which were attached to them for transportation on the march. The standard Muller limber common in the British Army called for wheels substantially of the same diameter as those on the carriage;²⁵ although, from contemporary reports and sketches, it is probable that most any combination of two wheels may have been used as a limber in the American service.

The Muller limber had double shafts for one horse; additional animals were hitched in tandem in front. The drivers normally walked beside their teams. All battlefield artillery maneuvering was done by means of drag ropes and hand spikes.²⁶ In both the British and American services, drivers were not officially soldiers until many years after the war.

²³This table was compiled in a logical pattern on the basis of available references. It may be noted that Muller and DeTousard do not agree in all cases, and sometimes they do not agree with themselves.

²⁴The French field guns were lightened and shortened about 1760, according to DeTousard; surviving specimens indicate that this change took place at least five years before. Three 4-pounders now at Newburgh cast by Berenger at Douay in 1756 are all of the new type.

²⁵Carriage wheels were 51 inches in diameter, or a little larger; limber wheels 48 inches for the 6- and 12-pounders and 45 inches for the 3-pounders. John Muller, *Treatise on Artillery* (Philadelphia, 1779), pp. 115-16.

The second type of carriage was known as the Galloper. This required entirely different construction from the usual Muller bracket carriage, as no limber at all was used. A single horse was placed in the heavy double shafts of the carriage itself. These shafts were sufficiently strong to support the weapon in recoil. A powerful draft animal could pull a 3-pounder in a Galloper carriage quite satisfactorily. He was capable of considerable speed over short distances on good terrain, if the driver was mounted on a separate animal. Presumably, this use gave rise to the name. This was at one time the standard infantry-accompanying carriage used in the British Army. The Galloper form of carriage could carry a 6-pounder gun as well, although apparently it was more commonly used with 1.5- and 3-pounders.

There was a third type of field carriage used at one time or another in the American Revolution. This was called the Grasshopper carriage; it was a fairly flexible mounting for artillery pieces up to and including light 3-pounders, made of ash, or oak, without wheels. This arrangement was transported on the march in a wagon; in action, it was picked up bodily and carried by its crew. It would have been most unsatisfactory in either army because of the difficulties of transporting it long distances over poor roads. No records of its use in the campaign in question are known.

Transporting ammunition was a problem never completely solved by field artillery before the use of caissons and limber chests. Neither of these was used during the Revolution. In both the bracket carriage and the Galloper, a small supply of ammunition was carried in boxes on either side of the piece. The limber was not used for carrying either gunners or ammunition.

²⁶Birkhimer, p. 2; Sergeant White's Narration in Stryker, p. 479.

The British ammunition wagon of this period was little more than a sturdily built farm wagon with rail bottom and stake and rail sides, provided with relatively low bows (bails) and a canvas cover. The structure of the wagon can be appreciated by the fact that the same vehicle was converted into a bread wagon by lining the bottom and sides with wicker work. The tumbril, normally used for transporting pioneer's tools, served equally well for powder in barrels. The 100-pound barrel was 15 inches in diameter top and bottom and 30 inches high. The tumbril too was provided with bows and a canvas cover which could be waterproofed. Only the powder cart with its central-lined powder compartment, its separate shot boxes and its peaked roof covered with oilcloth can be considered as a special single-purpose vehicle.

Knox had very satisfactory ammunition wagons and tool-and-powder carts in the regular sturdy farm vehicles and city carts of the Colonies, at least by the middle of the war. However, his vehicles of this type in the Trenton-Princeton campaign were probably limited.²⁷ Any carts at all were pressed into service.

Field guns fired solid cast-iron shot most of the time. For close-range work, the pieces were loaded with multiple projectiles known as grape or canister without distinction. Howitzers fired grape and canister of approximately the same type, and shell. The latter, sometimes called bombs or howitzers, were not so frequently employed in action during the Revolution in the field as is sometimes stated, even from howitzers.

THE GUNS AT TRENTON

With the above technical background, let us return to the desperate offensive across the Delaware on Christmas night. Travelling at approximately 20 miles per hour in an automobile, you now cross over in 36 seconds,

²⁷Knox's suggestions to Congress in Birkhimer, p. 5.

summer or winter, rain or shine, where McConkey's Ferry, called on the Jersey side, John's or Johnson's Ferry, once ran. One sleety December night a year ago the writer walked down to the bank on the Pennsylvania side of the river. The Delaware was flowing bank full with ice, swiftly and treacherously. The lights on the opposite shore were just discernible through the sleet and murk. No reasonable reward would have persuaded me to attempt that crossing in any form of rowboat, even unencumbered by artillery, horses, and the like. We have all read so much of Washington's feat that we now take it for granted. In all seriousness, it was as heroic and skillful an operation as can be found in military history.

Even before the effort started, the guns had a large part in the planning of the campaign. In direct contrast to the small, or negligible, importance of artillery in Colonial America and in some of the early actions fought by the Continental Army, the entire crossing of the Delaware was subordinated to the passage of the field pieces under the direction of Henry Knox. Eighteen guns and howitzers were ferried across the river, along with about 2,400 men.²⁸ Knox's great booming voice seems to have served as a public address system in marshalling the units of both infantry and artillery for their trip across the river; he and Colonel Glover controlled the boat crews of the latter's Marblehead regiment in their passages to and fro.²⁹

The eighteen pieces of field artillery to about 2,100 infantry is an almost unheard of proportion. The usual ratio was two or three pieces per thousand foot-soldiers. This ratio

²⁸Knox to Mrs. Knox states clearly "eighteen pieces," both guns and howitzers; others give both 16 and 20. Knox certainly ought to have known.

²⁹Sometimes the delay in crossing the Delaware is placed as high as four hours; however, as the actual battle began about 8:00 a.m. and it isn't light until after 6:00 at this time of year, two hours seems to be the maximum.

has remained fairly constant from Marlborough to World War II. Deviation from such a standard can be traced to two main factors. First, as already mentioned, the artillery was considered to be the wet-weather weapon. The ammunition carried by an infantryman would often refuse to function in damp weather. It was difficult to load a musket in really wet weather and get it to fire. The gunners, on the other hand, could plug up the vents and muzzles of their pieces and keep the entire inside of the weapon completely dry. There were standard coverings described in regulations; but it is unlikely that the Continental batteries were so equipped, although some simple and efficient leather devices were probably used. Their ammunition chests were practically waterproof. The powder charges in those days were put up by the gunners themselves; they could be encased in starched and tallowed cloth, so as to stand a sprinkle during the short interval from the chest to the gun. This cartridge could be pierced through the

vent after it was in place. Dry priming from a flask could be applied directly into the vent and shielded if necessary. Either slow match or port fire, used to fire the priming, once alight, would function in rain with a little care from the user.

The second factor causing this abnormally large proportion of artillery is more psychological than material. The Continental gunners had a high morale throughout their entire organization. They could be depended upon to stand and fight. They were, in addition, capable of very greatly augmenting the morale and solidarity of more or less inexperienced infantry. Washington and his generals knew all this and planned accordingly.

The Continental Army was entirely over the river and on its way in one column to Trenton, but separated into two columns at Birmingham.³⁰ This was done so as to strike the town from opposite ends at approximately the same time. Sullivan commanded the right column which advanced by the river

GREENE'S COLUMN

Battery Commander	Pieces	Organization
Forrest	Two 6-pounder guns; two 5.5-inch howitzers	Second Company of the Pennsylvania State Artillery
Hamilton	Two 6-pounder guns	New York State Artillery Company
Bauman	Three 3-pounder guns	New York Company of the Continental Artillery

SULLIVAN'S COLUMN

Sergeant	Two 6-pounder guns	Massachusetts Company of Continental Artillery
Neil	Two 3-pounder guns	Eastern Company of New Jersey State Artillery
Hugg	Two 3-pounder guns	Western Company of New Jersey State Artillery
Moulder	Three 4-pounder guns	Second Company of Philadelphia Associates

³⁰For more than a century, there has been a difference of opinion as to where the army divided; those who do not accept Wilkinson's statement in his *Memoirs* (Philadelphia, 1816) as to Birmingham, place the dividing point according to Forrest at Bear Tavern. If one walks over this territory today, keeping in mind the strategic situation, Birmingham appears far more logical.

Bear Tavern was too soon; it would have separated the two divisions by too great a distance and for too long a time. Besides, Forrest contradicts himself in the next paragraph when he says that, "Washington at Birmingham received a message from Sullivan. . . ." Forrest quoted in *Trenton Battle Monument and Washington's Campaign* (Trenton, 1951), p. 10.

road. Greene commanded the left which turned into the Pennington road before reaching Trenton. Sullivan's column seems to have been slightly the weaker, although each had nine field pieces. Both Washington and Knox accompanied Greene's column. The probable organization and composition of the artillery is given just above.³¹

The importance of the artillery in Washington's tactical plan can be estimated from the fact that four pieces of artillery were placed at the very head of each column, ready to go into action at a moment's notice. These pieces were undoubtedly already loaded with muzzles and vents plugged with waterproof stuff.

More is known of the tactical movements of the left column under Greene than of the right under Sullivan, perhaps because of the presence of Washington and Knox with the former. Forrest's company of guns and howitzers was at the very head of Greene's column. It moved into the intersection of King Street and Queen Street at the beginning of the battle precisely in accordance with the plan worked out in Pennsylvania days before. These two streets almost ran together at the head of the village. To control them with artillery was to control the village. The pieces probably had been unlimbered 200 or 300 yards outside of town and then drawn into position by the cannoneers. Every piece fired.

Hamilton's battery seems to have arrived shortly after the action started. Forrest moved all his guns over to Queen Street. Hamilton's two guns were firing down King Street during the abortive attempts of the Hessians to advance up that street. Probably four of the six Hessian field guns were in

action briefly in the middle of the village, but were silenced and then taken.

One of Forrest's howitzers broke its axle on the third discharge;³² but the other five pieces contributed greatly to the quick driving of the Hessians from the village. It is probable that the field guns were firing round shot and the howitzers both grape and explosive shell.³³ The virtue of the latter was two-fold; as fired in the field, howitzers were usually directed at low angles of elevation similar to guns. The shells would bound along at low velocity with burning fuses. They were quite capable of cutting a man in half and continuing their relatively slow movement until they exploded. In the meantime, they were visible to all and destroyed morale and solidarity of formation, at least momentarily.

The Hessian commander, Colonel Rahl, after being driven from the village, made two attempts to retake it; these were made approximately perpendicular to King and Queen Streets. At the time of the first, Forrest's and Hamilton's batteries were still at or near their original position where these two streets came together. The artillery fire down King Street which took the Hessians in the flank broke the first attack almost as soon as the enemy left the protection of the houses and entered the street.

About this time, Bauman's battery, the last in Greene's column, came up and moved out to the extreme left of Greene's division which now encircled the village to the north and east. While the infantry brigades of Mercer and Stirling were fighting in the streets and houses, Washington had ordered those of DeFerno and Stephen to form a line well to the east extending to the Assunpink, completely cutting off any retreat to

³¹This tabulation is based largely on Stryker; certain inconsistencies have been logically dealt with, and probabilities stated. It is emphasized that this is not exact, but merely a probable arrangement of pieces in the various batteries, or companies as they were then called.

³²Sergeant White's Narration, Stryker, p. 479.

³³Shells from howitzers would be logical, but not from guns; Bill, p. 53, mentions them, but from the wrong pieces. On page 56, the shells mentioned are from the right battery.

Princeton. Bauman's three guns were probably placed where these two brigades joined.

Soon the village was cleared. Rahl and von Dechow were endeavoring to organize their force in an apple orchard to the east. The battery of Forrest, and probably that of Hamilton also, were now moved farther east out of the village and put into position to sweep the eastern approaches to it. Hardly had they arrived, when the Hessians attacked the village again and received an enfilade fire from these pieces and probably Bauman's as well.

This attack was beaten completely; both Rahl and von Dechow were mortally wounded. The surviving Hessians retreated in disorder. The Continental division under Greene, probably now under the direct control of Washington, seems to have practically surrounded two of the three Hessian regiments. Hamilton's battery came south and faced these two from the west. Forrest and Bauman came forward on the north and east. These Hessians, without artillery, and with most of their muskets unable to fire because of the weather, surrendered.

Not nearly so much is known of the actual tactical maneuvering of Sullivan's division and the four batteries of artillery which accompanied it. Sargent's battery and either that of Neil or Hugg was at the head of the column. Sullivan's attack was almost perfectly coordinated with Greene's in point of time. An enemy Jaeger detachment of 50 men was quickly pushed into the village from their post in General Philemon Dickinson's house. Four pieces of American artillery entered Trenton by the river road at the head of Sullivan's column; two more were well up. All three of these two-gun batteries were in action very early in the fight in the lower part of Trenton.

This encounter was as short and almost as decisive as that at the top of the village.

The third Hessian regiment, with two guns, was driven out to the southeast and its two field pieces captured, apparently before they had fired a shot. The only bridge across the Assunpink, that at the foot of Queen Street, was soon in Continental hands.

Glover's infantry and one battery³⁴ of artillery went to the south side of the Assunpink over the bridge and took stations to hold the bridge. The three remaining batteries advanced through the village and were among the forces which finally encircled and forced the surrender of the third Hessian regiment; this came so rapidly, however, once the bridge was captured and held securely, that few rounds seem to have been fired.

The victory at Trenton was as complete as it was easy, so far as the fighting was concerned. Losses in the Continental Army had been trifling — not more than six or eight killed and wounded. Artillery fire had a tremendous amount to do with this. The Hessian force, of probably around 1,500, lost in excess of 120 killed and wounded and upwards of 1,000 prisoners. They were completely overawed and forced to surrender in large part because of the great preponderance of artillery against them. Their own six pieces were never properly brought into action at all. Four of them fired a few rounds while still within the village before being taken. The other two were able to retire with the third regiment from the lower village, but stuck fast in mud. All six pieces were captured before the infantry finally surrendered.

Washington's strategic plan before the battle of Trenton had been to have a fairly large Continental force cross the Delaware in four separate bodies. Actually, only one of these — that under his personal command — was able to cross at all, thanks to Knox's

³⁴Sargent's Battery; Stryker, p. 178.

direction and the maritime skill of Glover's Marblehead regiment. Even though he won the battle of Trenton with ease, Washington still was isolated on the New Jersey side of the river; he and the victorious army returned to Pennsylvania that evening. But the effect of the battle on the British was more than Washington anticipated. The British and Hessians retired from Bordentown, Burlington, and Mount Holly. Washington recrossed the river with practically his entire force. There was a good deal of maneuvering by both sides. Brigadier General Cadwalader of the Pennsylvania Militia, who had failed to make his assigned crossing on the 25th, was now particularly active. The British concentrated at Princeton in strong force by 1 January 1777. Under orders from Howe, Cornwallis abandoned his plans to return to England and rode down to take command of the troops gathered here. He spent the first night of the new year at Princeton. The Continental Army was known to be at Trenton.

THE GUNS AT PRINCETON

At dawn, the major part of the British force of 8,000 men and 28 pieces of artillery moved out towards Trenton. Their camp already extended in that direction as far as Eight Mile Run—eight miles from Trenton.

Those eight miles proved difficult. In addition to the miry roads, Washington had advanced a delaying force of perhaps 600 men and Forrest's two guns—the howitzers did not join in the action until it reached Trenton. This force did its work well in spite of certain defections. Though General DeFernoy left in such a hurry as to raise serious doubts as to his courage; the next in command, Colonel Hand of a Pennsylvania Rifle regiment, seems to have employed his riflemen and Forrest's two guns very skillfully indeed. They made the advancing army of Cornwallis go into battle formation at least

twice and held up their advance on several other occasions. The Pennsylvania riflemen from cover were deadly. The two guns, in addition to their actual fire on the long advancing columns, led the British commander to believe he was facing Washington's entire army.³⁵ On the outskirts of Trenton, there was a small earthwork held by infantry and four more field pieces. This force was also thrust back by the British. Cornwallis was, at last, face to face with the whole Continental Army, but the short winter afternoon was drawing to a close. The main American position was across the Assunpink; Continental detachments to the north had to run for it now, but almost every man and every gun made the bridge safely.

Washington's forces, concentrated at Trenton that morning, consisted of about 5,000 infantry and 40 pieces of artillery,³⁶ a ratio of eight pieces per 1,000 infantry. We know a good deal less of the organization and details of the artillery assembled on the heights south of the Assunpink than we do of the pieces that crossed the Delaware nine days before. A total of 22 pieces had probably been added. Some at least of these had been in battery organizations for some time. Cadwalader had with him, and was unable to bring across the river on Christmas night, two or three batteries. These consisted, during a part of his maneuvering between Crosswicks and Cranbury, of four iron 3-pounders and two brass 6-pounders.³⁷ Major Proctor brought a powerful battery of field artillery from Philadelphia which probably consisted of two or three brass French 4-pounders and

³⁵Bill, p. 86, summarizes this action well. See Alfred H. Bill, *The Campaign of Princeton* (Princeton, 1948).

³⁶Knox to Mrs. Knox, 7 January 1777; Knox says 30 or 40 pieces in action. History has assumed, not illogically, that Knox knew how many pieces he had, but not precisely how many went into action at this particular time; most later estimates, including those herein, are based on an initial 40 pieces less known withdrawals.

³⁷Stryker, p. 242.

an iron 3-pounder.³⁸ Washington had captured from the Hessians at Trenton six brass Hessian 3-pounders with all their equipment. Although these were eventually used in the Continental army,³⁹ it is not certain that they were used so soon. Some other pieces must also have been added.

Almost all the Continental guns opened fire on the British once they began to push through the village towards the Assunpink. Their fire and the aspect of the earthworks occupied by American infantry above the single bridge and two or three fords stopped the half-hearted attack in short order. The light was failing. Cornwallis went into camp for the night.

During his brief battle, Knox had marshalled and employed flawlessly a large battery of field guns, even though the number of infantry engaged was relatively small. This thunderous display was extremely beneficial to the American infantry which lacked discipline and training. At least half of Washington's army on 2 January 1777 was composed of recently joined militia. Inexperienced troops are always heartened by their own cannon and demoralized by the field pieces of the opposition. Knox was showing, at 26 years of age, his remarkable power for organizing and running a successful enterprise. He was choosing his artillery officers carefully and creating in the entire organization an *esprit de corps* unique in the army.

As complete darkness fell, the Continental batteries grew silent, save two howitzers with which Knox periodically threw shells into Trenton to prevent the British from enjoying an untroubled night's rest.⁴⁰

³⁸*Ibid.*, p. 257. When Proctor's battery maneuvered in New Jersey in October 1778 he had two 12-pounders; Adam Ferguson, *Memoir of Lt. Col. Patrick Ferguson* (Edinburgh, 1817), p. 37.

³⁹Baurmeister, p. 17.

⁴⁰Knox to Mrs. Knox, 7 January 1777; he specifically states "shells."

The situation of the Continental forces that night was extremely serious. Washington faced an army more numerous and infinitely better drilled and disciplined than his own. His front on the heights above the Assunpink was very strong. His left flank rested on the Delaware and was, therefore, completely safe; however, his right flank was in the air. A flanking movement by the British to their left could not be defeated with the force in hand. To be pinned against the Delaware would be fatal. Washington could not possibly cross it here in the face of an enemy. Retreat further down the left bank of the river would lead to probable annihilation. The Delaware was wider and deeper below Trenton. Southern Jersey becomes a peninsula between the Delaware and the Atlantic. It would have made an almost perfect cul-de-sac. However, Washington had no intention of retreating. He called a council of war. With the consummate diplomacy he used throughout the war, he allowed someone else to propose the idea, even though it had obviously been in his mind. By a night march, the Continental forces moved to their own right around the left wing of Cornwallis' army; they marched towards Princeton in the British rear.

Some 400 men and the two howitzers were left in the abandoned Continental position.⁴¹ Fires were kept up; shovels and picks were used noisily. At intervals a shell would describe a high arc in the air with fuse burning and explode where it fell.⁴² Meanwhile the main force of about 4,500 men and 35 pieces of artillery were moving towards their destiny at Princeton. There had been a sharp freeze; the back roads were passable. Gun-carriage wheels were muffled in rags and

⁴¹Stryker quotes "Officer of Distinction," p. 446, in letter from Pluckemin, 5 January 1777.

⁴²The standard howitzer carriages had removable bed plates between the cheek pieces so that the breech could be dropped down to give mortar-type fire, if desired; see Muller diagrams and explanatory text.

rope. The baggage and three heavy field guns, probably 12-pounders or French 8-pounders, were sent to Bordentown and Burlington.⁴³ The army arrived at the Quaker Meeting House a mile and a half outside Princeton just after sunrise on 3 January 1777. The British forces in Princeton consisted of three infantry regiments—the 17th, 40th, and 55th Foot—and probably three companies of Light Dragoons, at least partially dismounted.⁴⁴ There were about 1,200 in all. About two-thirds of these had moved out at sunrise to reinforce Cornwallis at Trenton and had crossed Stony Brook. When they saw the American forces, they recrossed and attacked.

The Continental army had divided at the Quaker Meeting House; a part going in to Princeton directly by the back road, and another part, under General Mercer, moving towards the Post Road to destroy the bridge over the brook to delay Cornwallis whose pursuit was anticipated as soon as daylight revealed the deception.

Mercer's brigade collided with the British force which had counter-marched back across the bridge. This meeting took place in an orchard surrounded by open fields between Stony Brook and the little village of Princeton. Mercer's command included Captain Daniel Neil's battery of two iron 3-pounders; this was the Eastern Company of the New Jersey State Artillery, already in action at

⁴³Everyone seems to agree on the number and that they were "heavy"; probably, they were just heavy field guns, though they could have been siege pieces. See n. 38; possibly 12-pounders.

⁴⁴These Light Dragoons have been variously stated to be mounted and dismounted; Diary of Captain Thomas Rodney, *Delaware Historical Society Papers* (Wilmington, 1879), vol. 1, part VIII, p. 34, states a part at least to be mounted; so does Stryker's "Officer of Distinction." Sergeant R., in his manuscript account of the battle now in the Princeton University Library has 50, at least, dismounted. The matter is further complicated by original references giving the regiment as both the 16th Light Dragoons and the 17th Light Dragoons; both were in America at the time, and were consolidated into a single regiment later.

Trenton. The British force also had two guns, brass 6-pounders, manned by Royal Artillerymen, perhaps mounted in Galloper carriages.⁴⁵

These two batteries faced each other, both to the southwest of the infantry they supported. However, apparently, both fired into the opposing infantry, rather than at each other. The British infantry broke Mercer's line so quickly and so completely that both Neil's pieces were captured and Neil himself killed. He received praise from Knox and others as an able artilleryman. He fired probably three or four rounds of grape into the British line before his pieces were captured.

In this first encounter, the compact force of British regulars had been completely successful. Mercer's brigade was in flight and he himself mortally wounded. The Royal Artillerymen, with aid from the infantry, took over the handling of the captured guns also. To make matters worse, Cadwalader's militia were arriving on the scene in column and were infected with the panic of Mercer's Continentals as they tried to form into line. The British fire, both from the four field pieces and the muskets of the infantry, seemed very heavy.

At this juncture, Moulder's battery came up. This was the second company of the Philadelphia Associator's Artillery—Philadelphia Militia—armed with three long French 4-pounders. One of these seems to have been captured; however, the other two went into action to the right of the Thomas Clarke house and were exposed to the entire fire of British artillery and infantry. These gunners, artisans, sailors, and dock workers in civilian life, withstood the challenge manfully and practically alone stopped the advance of the British sufficiently to allow

⁴⁵Original references state from two to eight. Both Washington and Knox agree on two—brass 6-pounders—but Rodney states eight; Ward has followed the latter.

Washington, Greene, Cadwalader, and others to stem the panic.⁴⁶ With their fire, they broke an attempt to flank the American position by a group of mounted Light Dragoons.⁴⁷

The far more numerous Continental Army recovered quickly from its initial discomfiture; Washington's heroic example brought both Continentals and Militia to a stand and turned them back against the foe. Hitchcock's Continentals arrived; unit after unit took its place in the American line which enveloped, overwhelmed, and finally shattered the British. Probably other batteries were in action briefly, but of this no record survives. The British 17th Foot and a part of the 55th were superb, even in defeat; however, they were definitely and completely routed within an incredibly short time. The Royal Artillery detachment is said to have suffered 100% killed and wounded.⁴⁸ Neil's guns were retaken along with the two British 6-pounders.

Meanwhile, Sullivan's Division was inactive facing the major portion of the British 55th and all the 40th. As soon as the western fight was over, Sullivan launched an attack which carried his division into Princeton, practically without firing a shot. There were undoubtedly several batteries with this column; however, no record of their services remains.⁴⁹ The British retreated towards Kingston and Rocky Hill.

Princeton had been one of a series of British posts across New Jersey. The British had been using the principal houses in the village for their quarters. Nassau Hall, then only

twenty years old, was by far the largest and most imposing building in the village. A number of Whig prisoners had been confined there; apparently, there were also some wounded British soldiers quartered there. Some of the retreating British from the 40th and 55th regiments took refuge in the place, believing perhaps that it might be held. However, the building was almost immediately enveloped by the Continental army. Alexander Hamilton's battery of two brass 6-pounders arrived and fired three rounds into the building.⁵⁰ One round went through the large window of the Prayer Hall, now the Faculty Room, and across this room to decapitate the painting of George II. A second round hit the solid south wall of the west wing of the building high up between the first and second windows from the Prayer Hall on the second floor above ground and rebounded, narrowly missing a field officer and his horse.⁵¹ The scar of this shot has been preserved in all the various repointing and rebuildings of Nassau Hall since then and is visible today. A third shot went through an upper window and interior partitions. Surrender of the British force came quickly; some authorities place the number captured as high as 194.

Hamilton's pieces were undoubtedly placed just out of musket shot. From the above details it would appear that the position of the pieces at the time of discharge was about where the first entry of Blair Hall is now. The guns had probably been loaded in the little valley then existing to the south of this point and manhandled up the hill by their crews.⁵²

⁴⁶Rodney, p. 34, and others.

⁴⁷*Ibid.*, p. 35. See also n. 44 above.

⁴⁸Casualties vary widely; Christopher Ward, *The War of the Revolution*, p. 316, quotes Howe's report of 18 killed as not including 10 artillerymen killed. Since there would have been only about 20 to 30 to handle two 6-pounder Gallopers, the remainder may easily have been wounded or captured.

⁴⁹According to Sullivan, the British here made little resistance, "owing to the manner of the attack"; Bill states, p. 112, that it was probably a flank movement to the south, in which I concur.

⁵⁰V. Lansing Collins, *President Witherspoon* (Princeton, 1952) II, 95.

⁵¹Ward, p. 315.

⁵²Wilkinson, pp. 144-45, states the firing to have taken place after the surrender of the British in Nassau Hall. George O. Trevelyan, *The American Revolution*, II, 137, states the shots to have been the "irreverence of a student fresh from a rival place of education"; it is unlikely, however, that Aaron Burr, a Princetonian, had this solely in mind when he shot the Columbia man 27½ years later.

Washington attacked along the back road into Princeton because the British had fortified the village to the southwest, towards both Trenton and McConkey's Ferry, where Washington had crossed the Delaware three times within ten days. There were several field pieces in these fortifications. Unfortunately, no record of their number, or exact designation, survives; however, there were probably six pieces divided between small earthworks at (1) the head of Nassau Street where Stockton Street and Bayard Lane come into it at the present time,⁵³ at (2) the intersection of Nassau Street and Wither- spoon Street, and perhaps (3) about where Washington Road enters Nassau Street now.⁵⁴ These pieces as well as some other stores in Princeton were taken by the Americans. There were insufficient horses, however, to carry the artillery pieces away, although Proctor exchanged an iron 3-pounder for a British brass 6-pounder.⁵⁵

Washington was able to occupy Princeton for about two hours. Cornwallis had awakened to the sound of guns to his rear. He then moved back towards Princeton in hot haste. Meanwhile, Washington was on his way to Kingston and New Brunswick, leaving only a small detachment of infantry and Forrest's battery of artillery to contest the crossing of Stony Brook below Worth's Mill. The British arrived before the bridge was completely demolished and opened fire with their artillery. Forrest's guns returned this fire. After a minor action, the Continental forces

retreated to Princeton and, almost immediately, towards Kingston.

However, the British forces by this time were considerably sobered by the sight of a battlefield where they had obviously lost. Someone in Princeton, probably a militiaman not on active duty, fired the howitzer already referred to from the fortification at the head of Nassau Street at the advancing British. The advance guard stopped, threw out skirmishers to either flank and waited for reinforcements.

After a considerable delay, the British came on again and advanced towards Kingston. The Continentals had torn up the bridge over the Millstone and posted Moulder's battery at the top of the hill with instructions to engage the enemy and then abandon its guns if necessary. These pieces, which had been so important in the fighting earlier in the day, now fired the shots which closed the campaign from the top of the Kingston hill. After a spirited cannonade, the gunners dragged their pieces to safety, limbered up, and were off towards Morristown.⁵⁶

As I write these lines, I see below me the route taken from Princeton to Kingston. The Kingston hill rises opposite; the way to Morristown stretches off to the left. A canister shot, just recovered from in front of Moulder's last position, rests on my desk. One feels a sense of solemn appreciation for what Washington and his small army accomplished: field guns were never better employed.

They reached their Morristown encampments safely. The entire course of the war had been changed. Knox and his gunners had contributed mightily, not only to two small victories, but also to the making of an army and a nation.

⁵⁶Accounts differ as to where this last action took place; it may have been on the west side of the Millstone. Moulder was brought before a court-martial for exposing his gunners, but cleared; Bill, pp. 118-19.

⁵³A mound of earth long preserved in this area now the residence of Mrs. Edgar Palmer at 2 Bayard Lane may easily be the remains of this early redoubt.

⁵⁴The variation between eyewitnesses — Rodney, Sergeant R., "An Officer of Distinction" as well as Washington, Knox, and Wilkinson — as to the guns captured in the battle may be explained in this way. They may have all seen the two pieces in the action to the west and then seen a part or all these in the fortifications.

⁵⁵Stryker, p. 446.