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MASSACHUSETTS HISTORICAL SOCIETY.
REPORTS

OF

EXPERIMENTS

WITH

Rice's Trowel Bayonet,

MADE BY OFFICERS OF THE ARMY,

PURSUANT TO INSTRUCTIONS FROM THE WAR DEPARTMENT.

NATIONAL ARMORY:
Springfield, Mass.
1874.
RICE'S TROWEL BAYONET.

HEAD-QUARTERS BATTALION OF ENGINEERS.

WILLET'S POINT, N. Y. H., May 27th, 1870.

Br't Maj. Gen'l A. A. HUMPHREYS, Commanding Corps of Engineers, Washington, D. C.:

GENERAL,—I have the honor to submit the following report upon the Trowel Bayonet, one hundred of which were sent by the Chief of Ordnance to this Post for trial.

THE ADVANTAGES ARE AS FOLLOWS:—

1st. In a bayonet charge, they will probably be as effective as the old pattern, being useful both for thrusting and cutting, while the appearance is even more appalling.

2d. As trowels, they may be made, by slight modification, very efficient for rapid entrenching; as hatchets, they may be used for cutting small brush.

Upon the whole, I am decidedly in favor of the change.

I am, General, very respectfully,
Your obedient servant,
HENRY L. ABBOT,
Maj. Eng'rs and Br't Brig. Gen. Comd'g.

Office Board on Small Arms,
St. Louis, Mo., June 10th, 1870.

General E. D. Townsend, Adjutant General U. S. Army,
Washington, D. C.:

GENERAL,—The Board of Officers, appointed by General Orders No. 60, Head-quarters of the Army, Adjutant General's Office, August 6, 1869, and whose duties were enlarged by
General Orders No. 72, of October 23, 1869, have the honor to submit the following report upon the subject of small arms and accoutrements for the use of the army of the United States:

SMALL ARMS.

The Trowel Bayonet, presented by Bvt Lieut. Col. E. Rice, is believed by the Board to be a valuable substitute for the common bayonet, on account of its great usefulness as an intrenching tool. It also appears to be quite as formidable a weapon as the other. This, however, depends greatly on the conception of the soldier who may be armed with it. The Board, therefore, recommends that five hundred Trowel Bayonets be manufactured, and placed in the hands of twenty or twenty-five company commanders, whose companies are skilled in the bayonet exercise, and that they be instructed to try them with special reference to the morale upon their men. If this test prove satisfactory, the Board recommend that the Trowel Bayonet be adopted to the exclusion of all others. All of which is respectfully submitted.

J. M. SCHOFIELD,
Major General U. S. Army.

J. H. POTTER,

W. MERRITT,
Brevet Major Gen'l, Lieut. Col. 9th Cavalry.

JAS. VAN VOAST,
Major 18th Infantry.

J. HAMILTON,
Brevet Colonel, Major 1st Artillery.

ORDNANCE OFFICE, WAR DEPARTMENT,
July 8th, 1870.

It is recommended that five hundred Trowel Bayonets be made and issued, as recommended by the Board.

A. B. DYER,
Brevet Major Gen'l, Chief of Ordnance, U. S. A.
HEAD-QUARTERS OF THE ARMY, July 12th, 1870.

Respectfully submitted to the Secretary of War. Concurring, fully with the report of the Board.


WAR DEPARTMENT, July 16, 1870.

The recommendations of the Chief of Ordnance are approved by the Secretary of War.

ED. SCHRIVER,
Inspector General.

HEAD-QUARTERS OF THE ARMY.

ADJUTANT GENERAL'S OFFICE,
WASHINGTON, February 4th, 1871.

To the Commanding General, Department of the Missouri,
Fort Leavenworth, Kansas: —

Sir,—The Chief of Ordnance having reported, under date of February 1st, 1871, that five hundred trawl bayonets were being manufactured at the Springfield Armory, Massachusetts, in pursuance of the recommendation of the St. Louis Board (see page 1st, Ordnance Memoranda, herewith enclosed), will be ready for issue in the course of two weeks, and requested that the companies be designated to which they are to be issued for trial, as indicated in the report of the Board, — he has been instructed to cause them to be furnished, when completed, to Leavenworth Arsenal, Kansas; and the General of the Army directs, that, when these bayonets are received, you will cause them to be issued to some regiments in your
Department that will give them the best test.* with instructions to experiment with them roughly in digging trenches for defence, or any other purpose, and forward a report upon the subject to this office, showing the result of such experiment.

Very respectfully,

Your obedient servant,

E. D. TOWNSEND,
Adjutant General.

* Gen. Pope, commanding the Department of the Missouri, ordered the 3d and 5th Regiments of Infantry to test the five hundred trowel bayonets.

[See Reports.]
HEAD-QUARTERS DEPARTMENT OF THE MISSOURI.

Fort Leavenworth, Kansas, Oct. 11, 1871.

To General E. D. Townsend, Adjutant General U. S. Army, Washington, D. C.:—

General,—I have the honor to acknowledge the due receipt of your letter of February 4th, 1871, relating to the shipment of five hundred (500) trowel bayonets to the Leavenworth Arsenal for issue and trial in this Department, and in compliance with instructions contained therein, I forward herewith reports showing result of experiments and tests made in the premises.

I have seen the bayonets tested so that in fifteen (15) minutes two (2) companies of Infantry so covered themselves that they could not be seen at a distance of fifty (50) feet in front of an embankment which had been thrown up by them with the bayonet, and which could not be penetrated by a musket-ball fired at a distance of ten (10) feet.

I am, General,
Respectfully,
Your obedient servant.

JOHN POPE,
Brevet Major General Commanding.

[First endorsement.]

Head-quarters of the Army,
Washington, October 19, 1871.

Respectfully submitted to the Secretary of War.
The trowel bayonet certainly has merit for active service, and the tests herein reported are as favorable as could be expected.

W. T. SHERMAN, General.
[Second endorsement.]

Ordnance Office,
November 1, 1871.

Respectfully returned to the Adjutant General.

These reports upon the trowel bayonet are conflicting, and satisfy me that it ought not, at this time, to be adopted for general service.

If a trowel bayonet is given to the soldier, he will frequently in service use it for digging when it is "fixed," and there will be great danger of his bending the barrel and destroying the usefulness of the musket. I believe a small trowel, which can be carried in a soldier's belt, will be quite as effective for digging as the trowel-bayonet when not "fixed," and it would cost much less.

Some should certainly be tried in service before the trowel-bayonet is adopted.

A. B. DYER,
Chief of Ordnance.

[Third endorsement.]

Head-quarters of the Army,
Washington, November 2, 1871.

Respectfully returned to the Secretary of War, with report of the Chief of Ordnance.

W. T. SHERMAN,
General.
REPORTS

OF THE

OFFICERS OF THE THIRD U. S. INFANTRY,

STATIONED AT

FORTS DODGE, HAYS, LARNED, LEAVENWORTH, LYON, AND WALLACE,

IN THE

DEPARTMENT OF THE MISSOURI.

RECAPITULATION.

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As a bayonet, I can only say that if your antagonist will agree to arm himself with the same bayonet, I see no objection to its adoption; but the present bayonet is 8 1/2 inches longer than the trowel bayonet, an advantage that would be materially felt at close quarters.

DE L. FLOYD JONES,
Colonel 3d Infantry.

[Against adoption.]

In compliance with the letter dated 8th instant, I have the honor to make the following report on the trowel bayonet:—

I would suggest, first, that the shank be made at least one and one-half inches longer (at its present length it blisters the hand), which being done, in my opinion, will make the weapon as follows:—

1st. As a weapon of offence or defence, it is equal to the bayonet now in use.

2d. As an intrenching tool, it is invaluable in active field operations.

3d. For garrison or other duty, in time of peace, it is equal to the one now used.

I have tried this bayonet for three months on all kinds of duty, and the verdict of the men using them is, we prefer them to the old bayonet.

I cannot too strongly recommend their introduction.

JOHN R. BROOKE,
Lieut. Colonel 3d Infantry,
Brevet Brigadier General U. S. Army.

[For adoption.]

I have the honor to say that in the experiments made with the "trowel bayonet," the results were eminently successful. My company, in nine (9) minutes (prairie soil), threw up an embankment of sufficient height so that at one hundred (100) feet they could not be seen when lying down, and of sufficient thickness to stop a rifle ball.
My experience during the late war, and since on the plains, leads me to say unhesitatingly, that from the various uses to which the bayonet can be put, its adoption will be a necessity in the Army.

I consider the moral effect greater than the old bayonet, and if used as a weapon at close quarters more deadly.

WM. H. PENROSE,

Captain 3d Infantry,
Brevet Brig. Gen. U. S. A.

[For adoption.]

The ground chosen for the trial was a grass-grown field, the soil of ordinary firmness. My company was then formed in one rank, and in this their second drill threw up in seven minutes an earth-work about two and a half feet high, and sufficiently substantial to turn bullets at ordinary range.

From the experience derived from several years of active service during the late war, I should judge that this bayonet would prove invaluable in active field operations. Upon the whole, and taking into consideration the fact that the bayonet is a formidable weapon of offence or defence, I am of opinion that it possesses decided advantage over the bayonet at present in general use in the Army, and I would therefore respectfully recommend its adoption.

DAINGERFIELD PARKER,


[For adoption.]


I would state, in behalf of my lieutenants and self, we are of one opinion as to its use, and that is, that where the present bayonet is but an almost useless appendage, the trowel bayonet would really be invaluable for all the purposes claimed for it.

I would suggest an improvement of the shank, so as to make it more of a handle.

J. FORD KENT,

Capt. 3d Infantry, Bt. Lt. Col. U. S. Army.

[For adoption.]
I recognize the necessity of something to dig with, and the trowel bayonet combines the weapon and intrenching tool without additional weight or care to the soldier.

I trust that the invention may receive the attention it deserves.

JOHN H. PAGE,

*Captain 3d Infantry,*

*Bvt Maj. U. S. Army.*

[For adoption.]

I am in favor of the trowel bayonet.

G. E. HEAD,

*Capt. 3d U. S. Infantry,*

*Bvt Maj. U. S. Army.*

[For adoption.]

1. A trench twenty-two feet long, ten inches deep, three feet wide; average height from bottom of trench, twenty-seven inches; breadth of work thrown up, three and a half feet; time occupied, fifteen minutes.

2. A trench twenty-one feet long, eight inches deep, thirty inches wide; average height from bottom of ditch, twenty-five inches; breadth of work thrown up, thirty inches; time occupied, fifteen minutes. I am not in favor of the trowel bayonet.

EDWD. MOALE,

*Captain 3d Infantry,*


[Against adoption.]

It took the men of my company, in double rank, forty minutes' incessant labor, to accomplish what the inventor claimed would be performed in four minutes, to wit: earthwork eighteen inches high, twenty broad at top, and forty at base.

No experiments in double rank, face to face, were made, as such seemed an absurdity after the signal failure of the first.

The imperfections of manufacture aside, I consider the trowel bayonet, as issued, a failure.

LOUIS T. MORRIS,

*Captain 3d Infantry,*

*Bvt Maj. U. S. Army.*

[Against adoption.]
I received twenty trowel bayonets, May 31, 1871. They were in constant use in my Company, "D," Third Infantry, during June, July and August.

Upon inquiring among the men to whom they were issued (men who have seen service), I find that they prefer the trowel bayonet to the old style, giving their reasons as follows: —

1st. Though not quite so ornamental, it is fully as useful for garrison duty.

2d. For small detachments performing escort duty on the plains, it is invaluable.

3d. As a weapon of offence and defence, it is superior in every respect.

J. H. GAGEBY,
Captain 3d Infantry.

[For adoption.]

This pattern of bayonet, although presenting a less military appearance than the old one, will no doubt (in a bayonet charge) be as effective, and, after becoming accustomed to the eye, probably look as well.

For men on picket, on the skirmish line and detached service, particularly in this country, it is an excellent thing.

J. A. SNYDER,
Captain 3d U. S. Infantry.

[For adoption.]

I am convinced that as an implement of war, for attack or defence, the trowel bayonet is superior to the old bayonet; the slight objection to the trowel bayonet should not be entertained, when you take into consideration its great qualities as an intrenching tool, for throwing up temporary shelter for troops when under galling fire from the enemy. It is a well-known fact, that on many an occasion during the late war our lines had to retire, but, had they been armed with the trowel-bayonet, they could have thrown up a temporary shelter, and thus in many instances would have been enabled to hold on to their position, and perhaps in some cases could have repulsed the
enemy with loss, instead of being themselves driven off the field. I am also of opinion that it would be equally as good in a charge as the old bayonet, and I think its effect on an enemy would be far more demoralizing, it being more appalling in appearance; besides, its qualities as an intrenching tool are invaluable, and ought to be sufficient to convince any one conversant with active field service, of its superiority over the old bayonet, and from long experience I am convinced that it is superior to any other bayonet known, and I hope that it will be adopted for general use in the Army.

W. MITCHELL,
1st Lieut. 3d U. S. Infantry,
Bvt Capt. U. S. Army.

[For adoption.]

While in my opinion there can be no doubt in the mind of any person who has witnessed a simple drill with the weapon, either ditching or intrenching, as to its superiority, it is invaluable as it affords every soldier the means of intrenching and protecting himself from the fire of an enemy at a few moments' notice.

I consider that the Army would be greatly benefited by the adoption of the trowel bayonet by the Government.

E. A. BELGER,
1st Lieut. 3d Infantry,

[For adoption.]

I believe that it is essential that our soldiery should be provided with an implement for intrenching purposes.

I have never seen any so well adapted for the purposes for which designed as the Rice Trowel Bayonet.

WM. KRAUSE,
1st Lieut. 3d Infantry.

[For adoption.]

As a weapon of offence or defence, it is equal to the bayonet now in use.

As an intrenching tool, it is invaluable in active field opera-
tions, and for garrison or other duty in time of peace, it is
equal to the one now in use.

The verdict of the troops using them is, we prefer them to
the old bayonet, and I with pleasure strongly recommend their
introduction.

THOS. S. WALLACE,
1st Lieut. 3d Infantry.

[For adoption.]

I have carefully examined the trowel bayonet invented by
Colonel Rice, and have witnessed experiments as to its utility,
and I am fully convinced of its usefulness for field service.
The breech-loading system of small arms necessarily lessens
the chances for the bayonet being used in actual conflict, and it
is therefore of importance to have a weapon which can be used
as an intrenching tool. This requirement the trowel bayonet
fills better than anything else I have seen. I have known
many instances during the war, when light field-works were
thrown up with tin cups, pieces of cracker-boxes, etc., when if
the trowel bayonet had been in use, the work could have been
better done in half the time, and with much less labor to the
troops. The addition of a suitable handle for the bayonet is,
I think, necessary.

WILLIAM S. MACKAY,
Lieut. 3d Infantry.

[For adoption.]

The trowel bayonet, invented by B'vet Lieut. Col. Edmund
Rice, U. S. Army, has been familiar to me for over a year.
I have seen it tested in all seasons and in different varieties of
soil, by from two to eighty men working at once.

As an instance of its utility, I have to-day seen four men lan-
guishly throw up a shelter-trench nine (9) feet long, twenty (20)
inches high, and twenty-six (26) inches at base, in seven (7)
minutes.

I am satisfied that the defence could have been created in
little more than half that time, had the men exerted themselves.
I know that in an emergency, a single man, provided with the
"T. B." can securely protect himself from musketry fire, in from three to five minutes, according to the nature of the soil.

In my opinion, the trowel bayonet has fairly withstood the tests of rough service, time, and unfavorable criticisms. I hope that it will be adopted by the musket-bearing portion of our Army.

PHILIP READE,
2d Lieut. 3d Infantry.

[For adoption.]

The trowel bayonet has been in use by Co. "K," 3d Infantry, since last summer, and has been as thoroughly tested as is practicable outside of actual field service. Doubtful at first of its merits, I observed it closely while in use, both as an intrenching tool, and when fixed, for bayonet exercise and garrison duties. I am now free to say that it is superior in many, and at least equal in all respects to the regulation bayonet now in ordinary use, provided it is properly made according to the Rice pattern. Without the least urging, Company "K," 3d Infantry, constructed with the bayonet in less than eight minutes a thorough protection against rifle fire, in ground selected by me purposely on account of its being badly adapted to digging purposes. Under fire the work would certainly be performed in less time. I have had but a limited experience in service against organized armies, but in over fifteen years' service on the frontier, I can recall many an instance where the trowel bayonet would have been very welcome indeed to deepen a buffalo wallow, or to throw up a small earth-work for protection against a hot fire from Indians. The position of being without the least shelter on the prairies, not a stone or piece of wood within sight or reach, hotly pursued by mounted Indians on all sides, has to be experienced in order to value properly an intrenching tool always on hand, as would be the trowel bayonet. I have no doubt that its moral effect on an adversary would be better than the present bayonet in use.

I have heard the objection (a silly one it appears to me as far as my experience goes) raised that men would use the
bayonet for digging when fixed, thereby bending the barrel. A soldier will never fix his bayonet unless required to, as the gun is easier carried without it. Present tactics, probably in view of this, provide for the bayonet to be unfixed ordinarily. To dig with the bayonet on the gun would never be attempted, as it would be a very awkward way to handle it, when its use would be called into play for self-protection. A recruit might be found guilty of this, as well as he often is of running the bayonet now in use into a tree, or a log, or wall, endangering the barrel. Nobody, I think, however, would, therefore, for a moment think of depriving the Infantry arm of half its force by taking away the bayonet. Others say that men will dig when they should be advancing. Such a remark appears to me rather a question of personal bravery on the part of the commander, who would stop to dig, when a bold advance would carry the day, but no objection to the bayonet. Others say, give the soldier a trowel in addition to his present accoutrements. This comes generally from men who have never carried a gun or knapsack, and cannot appreciate the feeling of a man who is loaded down already too much with a miserable knapsack and haversack, to say nothing of the heavy cartridge-box.

I hope that enough bayonets of Rice's pattern will be issued to troops serving on the frontier to allow of their being tried in field service; once used I have no doubt few soldiers will be found who will willingly change them for the old arms.

WILLIAM GERLACH,
2d Lieut. 3d Infantry.

[For adoption.]

I am an advocate of the trowel bayonet, and I hope it may be adopted throughout the Army.

J. C. AYERS,
2d Lieut. 3d Infantry.

[For adoption.]
I have seen an earth-work thrown up with the Rice trowel bayonet within twenty (20) minutes, on the most unfavorable ground, I believe, in the United States, sufficiently high and long to completely shelter a small company of Infantry, from a musketry fire at ten yards' distance. At the battle of Fredericksburg, in December, 1862, the regiment to which I belonged (9th N. Y. S. M.), lost forty per cent. of its strength from the fire of sharpshooters, whilst lying down in line awaiting the order to advance,—a disaster which I truly believe would have been avoided had the trowel bayonet been at that time in use.

While it is an uncouth weapon, yet the great good of which it is capable will doubtless recommend it to soldiers in active service.

CHAS. E. CAMPBELL,
2d Lieut. 3d Infantry.

[For adoption.]
REPORTS
OF THE
OFFICERS OF THE FIFTH U. S. INFANTRY,
STATIONED AT
FORTS HARKER, HAYS, LEAVENWORTH,
SCOTT AND WALLACE,
IN THE
DEPARTMENT OF THE MISSOURI.

RECAPITULATION.

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The bayonet has been for some time in use by three companies of this garrison, and I have examined and tested it as a bayonet and as a trowel.

1st. As a bayonet, I believe it to be as formidable a weapon as the one now in use, and that as severe a wound can be inflicted with it; also its moral effect in a charge would be as great as that of the old one. The difference in weight and length between the two, I think, is too slight to enter as an element into the question of accepting or rejecting the trowel bayonet.

2d. As a trowel, it has been severely tested under my immediate supervision. A company in single rank, working in a soil of medium hardness, threw up in a space of ten minutes a work along its entire front of sufficient height and thickness to protect a line of battle. The work was tested and found to be bullet-proof against the Springfield breech-loader; at a distance of twenty (20) paces, the balls would not penetrate half through the work.

I think the manner of carrying the bayonet scabbard could be improved by attaching it to the waist-belt by a clasp, so that the bayonet might be carried in an upright position; also that the shank of the bayonet be made longer, something like the shank of the sabre-bayonet, which would give the soldier a firmer grasp in using it.

From an experience of four years of service in the field during the recent war, I am fully satisfied that an Army, or a body of troops, equipped with this bayonet, would, in the ordinary emergencies of a protracted campaign, have so great an advantage over an equal body equipped with the old bayonet, as to compel its adoption at once. It is only in actual field service, in the presence of an enterprising enemy, that an instrument of this kind could be fully appreciated. In an attack, its value would be great in enabling the assaulting party to hold the position gained, and in an almost incredible short time make a position defensible. In a retreat, a small party could occupy positions, and, with this bayonet, in a few minutes, make the lines defensible against a much larger force.
For a line of battle or skirmish line, I am satisfied this weapon is a great improvement over the old one, and I have no hesitation in recommending that it be adopted in our service.

NELSON A. MILES,
Colonel 5th Infantry,
Brevet Major General U. S. Army.

[For adoption.]

As an intrenching tool it is beyond doubt capable of rendering important service in active operation.

GEORGE GIBSON,
Major 5th Infantry,

[For adoption.]

I have the honor to submit the following as my opinion on the "Rice Trowel Bayonet," premising that my opportunity for forming an opinion is found in the fact that several companies comprising this garrison have been for several months past provided with these bayonets, and that I have observed them particularly, not only in ordinary garrison duty, but also on the occasion of tests of the bayonet as intrenching tool, which tests have, I think, been more fully reported on by other officers.

I am of the opinion that the trowel bayonet should be adopted in the Army, to the exclusion of the one now in use, for the reason that, while it does not lack any material quality as a weapon which the one now in use possesses, it does have qualities of very great value as an intrenching tool, and as an implement for general useful purposes in camp or bivouac, which the one now in use does not have, and which have only been found hitherto in more cumbersome implements, which frequently could not be had when wanted, and when furnished require transportation.

I should apprehend no greater difficulty in teaching men
how and when to use this bayonet than in teaching them the same things regarding the remainder of their equipment.

Regarding the two chief objections urged against the trowel bayonet, viz.:

1st. That it is unsightly; and,
2d. That a trowel separate from the bayonet would be better,

_I should say that if the Army existed for show more than for use, the first objection would be opposite, and that at this time, when to mobilize an army is to strip it of everything except that which is absolutely essential to feed, move, and fight it, to adopt an additional burden for the soldier would be to advance backwards._

GEO. W. BAIRD,

1st Lieut. and Adjutant 5th U. S. Infantry.

[For adoption.]

I have examined and tested the Rice Trowel Bayonet. There can be no doubt of its superiority, in every respect, over the bayonet now in use in the Army. As an intrenching tool it can be fully appreciated by those soldiers, who during the Rebellion were so often found in line of battle and on the skirmish line without the means of protecting themselves from the fire of the enemy, and who frequently split their canteens to enable them to scrape together sufficient earth to shield their bodies while lying down.

_With this tool, which combines the twofold purpose of the pick and the spade, a perfect cover can be made against Infantry fire in the short period of from five to eight minutes._ A formidable field-work could also be made with it in an incredibly brief time, should the working party be large. As a tool for camp and field use it is invaluable. Should it be hardened and sharpened on one side, it might serve as a hatchet for ordinary use, and prove an excellent implement for making abattis, as well as a trowel for ditching tents, building mud and stone chimneys, and chinking log huts for winter quarters,
etc. As a bayonet, I believe its moral effect to be as great as that of the old pattern, and in these days of long-range rifled muskets its greater usefulness admits of no comparison.

I think the socket should be lengthened, at least an inch, to facilitate the handling as well as to increase the leverage of the tool.

_I have no hesitation in saying that I believe it should be adopted for the Army at once._

F. H. HATHAWAY,
2d Lieut. and R. Q. M. 5th Infantry,
B'vt Capt. U. S Army.

[For adoption.]

After a practical test of the merits of the trowel bayonet, I am satisfied of its general usefulness as an intrenching tool, and would respectfully recommend its adoption for the use of troops when in active field service.

D. H. BROTHERTON,
Captain 5th Infantry, B'vt Maj. U. S. A.

[For adoption.]

I have to state that I have examined the Rice trowel bayonet, and that I am of the opinion that it is valuable as an intrenching tool, and would be of use to the soldier both in the field and camp.

H. B. BRISTOL,

[For adoption.]

I have the honor to transmit the following report upon the trowel bayonet, thirty-five (35) of which have been furnished the garrison at this post for trial.

_I consider them a valuable substitute for the common bayonet, on account of their great usefulness as intrenching_
tools, and because I think the moral effect upon the enemy much more appalling.

I would add that I am in favor of a change from the old to the trowel bayonet for the Army, and respectfully recommend its adoption to the exclusion of all others.

SIMON SNYDER,

Captain 5th Infantry.

[For adoption.]

I consider the trowel bayonet to be an excellent substitute for the bayonet generally used, it being very valuable as an intrenching tool, and something which should be adopted for use in the Army.

JAMES S. CASEY,

Captain 5th Infantry, Bvt Maj. U. S. Army.

[For adoption.]

My report upon the "Rice Trowel Bayonet," made soon after the bayonet was issued, was unfavorable, and I was opposed to its adoption for some time.

After witnessing the several convincing experiments recently made with this bayonet, I freely acknowledge to have materially changed my views, and I now consider its merits as a practicable intrenching tool, and an article of general utility to the soldier in the field, to be established beyond a doubt.

The improved handle (sabre bayonet-handle) would add greatly towards facilitating work. I hope for the general adoption of the bayonet.

SAML. OVENSHINE,

Captain 5th U. S. Infantry.

[For adoption.]

In accordance with orders, I caused experiments to be made with the trowel bayonet, the results of which were highly satisfactory. The officers selected to make the trials have
expressed their opinion in favor of the adoption of the Rice bayonet.

It is not difficult to conceive an emergency in active service, when the possession of such a bayonet by troops would be of immeasurable value.

I am in favor of the adoption of the trowel bayonet.

E. BUTLER,  
Captain 5th U. S. Infantry.

[For adoption.]

In this region the prairie sod is a foot in depth, and extremely tough and dense. The bayonet has, therefore, been used at a disadvantage in digging at the guard stations along the railroad; still it has been used with success, and any objection made to the weapon on this score might equally be made against a pick or any tool.

In tilled soil, or ordinary arable land, I find that a trench or pit may be dug by a rank of men in five minutes, having a relief of two feet, with a parapet of two feet in thickness at top, and natural slope, and defiling the persons of the men lying stretched or stooping, from musketry fire; and a double rank in the same time would enlarge the trench to afford corresponding cover.

A single skirmisher can dig shelter for himself in the same time.

If time should admit, the weapon would be useful in extending the work to any strength usual in the field, and twenty to thirty minutes would suffice to erect substantial earth-works.

The socket might be lengthened, say half an inch, with advantage, and a stopper could be made, which should fit in the lower end of the socket, when used as a tool, for greater length, to give ease to the hand.

But in actual use in the field, the self-reliant American soldier, having the essential part, will improvise, with wood, means to vary its adaption and increase its effectiveness as an implement. He will probably carry a little helve, which he will fit in the socket, and so make of the trowel a spade.
Its convenience for various personal uses of the soldier is too obvious to require suggestion. As a bayonet, the weapon seems equally effecttive as the other. I imagine its moral effect upon cavalry would be greater.

Though shorter, it has the advantage of the cut.

I respectfully recommend the adoption of the bayonet at once.

W. LYMAN,
Brevet Major U. S. Army,
Captain 5th Infantry.

[For adoption.]

The report made by me upon the Rice trowel bayonet soon after it was issued to my company for trial was unfavorable.

I am now of the opinion that, if the bayonets issued had been properly made and of better material, and the company instructed in using them to the best advantage, my report on the same could not have been otherwise than favorable.

As an intrenching tool, which the soldier will always have with him, I know of none better.

E. P. EWERS,
Captain 5th U. S. Infantry.

[For adoption.]

The trowel worked well, and the use of short wooden handles inserted in the shank was found to add much to the efficiency and use of working.

The amount of work done could easily be doubled in the same time, in case of emergency.

A. S. BENNETT,
Capt. 5th U. S. Infantry.

[For adoption.]

I am forced to acknowledge its great usefulness and advantage over the present one now in use. As an intrenching tool
it would be invaluable. The adoption of this "bayonet" I am sure would be beneficial to the interests of the service.

MASON CARTER,
1st Lieut. 5th Infantry, 2d Lt. Capt. U. S. Army.
[For adoption.]

It is a very great acquisition to the service.

GEO. McDermott,
1st Lieut. 5th Infantry.
[For adoption.]

1st. In my opinion the moral effect on an enemy with the trowel bayonet in a charge would be equal to, if not greater, than that of the old bayonet.

2d. The trowel bayonet can be used to a great advantage in throwing up rifle-pits and building field-works, thereby adding to the mobility of the army by the decreased number of wagons required to transport intrenching tools.

3d. The moral effect will be very good on the officers and men of the infantry of an Army of knowing that they have the means ever at hand to cover themselves by a good rifle-pit in ten (10) minutes, and to build, with the assistance of what almost every country affords in the way of rails, logs, stone, sods, etc., in twenty (20) or thirty (30) minutes, a field-work capable of stopping projectiles from field guns.

4th. The trowel bayonet, by sharpening one side of it, can be used with great advantage for cutting poles and pins for shelter tents, cutting ditches around shelter and other tents, plastering log huts of troops in winter quarters, such as was used during the late war, also for building chimneys for the same.

5th. The trowel bayonet can be used with advantage by skirmishers or troops on picket, as rest for their guns when firing lying down, which is frequently a great desideratum in war.
In forming my opinion of the merits of this bayonet, I have the honor to state that I have been aided by my experience in actual war, in coming to the conclusion, as stated in the reasons above mentioned, as I served three years as a line officer, two years of that time in command of a company that was engaged in every battle fought by the Army of the Potomac, with exception of two, and in numberless skirmishes and affairs not participated in by the whole army; and during that time, I often felt, as doubtless every line officer who served with his company during the war did, want of something other than tin plates, halves of canteens, sharpened sticks, etc., with which to throw up temporary shelter from the fire of the enemy, as the intrenching tools of an Army rarely ever get up to the front until the exigency for their use has passed.

In conclusion, I respectfully recommend the adoption of this bayonet for the use of the Army, to the exclusion of all others, as I consider the old bayonet, as compared with Rice's bayonet, for general usefulness and manifold service, as about one pound of useless iron.

T. H. LOGAN,
1st Lieut. 5th Infantry, Brevet Major U. S. Army.
[For adoption.]

I hardly think it necessary to enlarge upon its merits, which, in my opinion, must be evident to all men who saw troops scratch up earth under fire, with their hands, plates, ordinary bayonets, and other means at the disposal of the troops, with no intrenching tools at hand.

EDW. L. RANDALL,
1st Lieut. 5th Infantry.
[For adoption.]

Having often experienced the want of some convenient intrenching tool, on the skirmish line in actual service, I am prepared to judge of the utility of articles offered for such
purposes, and I consider the trowel bayonet an excellent article for the uses for which it is designed, and hope that it may be adopted by the government.

HENRY ROMEYN,
1st Lieut. 5th Infantry, Bvt Capt. U. S. Army.
[For adoption.]

Having witnessed several experimental trials of the trowel bayonets by companies of this garrison, and seeing trenches thrown up by them in less than ten minutes, of sufficient height to completely conceal and protect a line of troops at twenty yards, and of a thickness which could not be penetrated by a rifle-ball at twenty yards, I am fully convinced of the usefulness of the trowel bayonet, and of the great advantage to be derived by its adoption for the Army.

The work I saw performed was done by troops unaccustomed to the use of the trowel bayonet, and there was no incentive to urge them to work rapidly. The ground was ordinary sod.

I would recommend this bayonet with the improved socket, for general use in the Army.

GRANVILLE LEWIS,
1st Lieut. 5th Infantry.
[For adoption.]

I am forced to conclude that this bayonet is useless for the fulfilment of the supposed requirements for which it was constructed. The fault, breaking and bending, could be remedied by introducing better metal.

As an offensive weapon, it is not equal to the old bayonet now in use, the great extent of flattened surface rendering it less sure of inflicting a prompt, sure, and serious wound, in case of a charge or the repulse of an attack; this same extent of surface making such prominent projections near the shank of the bayonet renders it quite likely to be wrenched from the gun, or the musket itself be pulled from the hands of the sol-
dier, in case of an interlocking of bayonets or sabres and bayonets.

Finally, if the bayonet is to be used at all, this one not being the weapon, offensively or defensively, claimed for it, is subject to the further objection of not being ornamental. The old bayonet is preferable, being fully as useful, more ornamental, and a better offensive weapon. This bayonet, the "Rice," wears an uncouth and ugly appearance on the musket; as worn in the scabbard, interferes with the movements of the piece when handled at drills, parades, etc. I see no way of remedying this.

QUINTIN CAMPBELL,
1st Lieutenant 5th Infantry.

[Against adoption.]

Since it has been used in this company, it has been experimented upon several times, and from those experimental trials, and my experience during four years of active service in the late war, I have come to the conclusion that, as an intrenching tool, and as a weapon, it is superior to the one now in use, and I earnestly recommend the adoption of the trowel bayonet in our Army at once.

C. E. HARGOUS,
2d Lieut. 5th Infantry, B’t Capt. U. S. Army.

[For adoption.]

I would state that, in my opinion, for the purpose of immediate use in face of the enemy in throwing up temporary works, this bayonet is far superior to anything that has been suggested.

I have no hesitation in recommending its adoption into the U. S. Army.

GEO. P. BORDEN,
2d Lieut. 5th Infantry.

[For adoption.]
The "trowel bayonet" is a great improvement upon the common bayonet now in use. Besides being a weapon equal, if not superior, in close quarters, it is a useful tool, affording ready means of securing cover.

I am strongly in favor of its general adoption, and would respectfully recommend the same.

D. Q. ROUSSEAU,
2d Lieut. 5th Infantry.

[For adoption.]

As a weapon it certainly is as useful as the present one, and presents as formidable appearance to an enemy, although to the fastidious eye it may not present as fine a military appearance. But such weapons in time of war are not accepted on account of their pleasing appearance, but on account of their actual worth, and as such the trowel bayonet has no equal, and I cannot too strongly recommend its adoption in the Army above all others.

I am fully convinced that, when it becomes better known in the Army, it will be accepted as a tool of great utility, and an indispensable weapon.

JAMES H. WHITTEN,
Lieut. 5th Infantry.

[For adoption.]

I have seen "Rice's trowel bayonet" tested as an intrenching tool. The trial was made by men for the most part totally unacquainted with its use. The soil was ordinary sod. In five minutes an embankment was thrown up capable of affording good shelter for the men, lying down, even at close range. With men drilled in the use of the bayonet, double the work ought to have been done.

The test proved beyond doubt the usefulness of the bayonet as an intrenching tool. For the small use of the bayonet at present as a weapon of attack and defence, the trowel-bayonet will certainly serve as well as that now in use.
Such trivial objections as its uncouthness, which seems merely a prejudice in favor of establishing forms, and the impossibility of “stacking arms” with it, should have no weight opposed to its numerous and important advantages.

The substitution of the “trowel bayonet” for the present useless weapon would, in my opinion, prove unquestionably beneficial.

J. W. POPE,
2d Lieut. 5th Infantry.

[For adoption.]

The “trowel bayonet” has been in use in the company to which I belong for more than a year. I have experimented with it, and am satisfied with its general utility.

The bayonet is well adapted for rapid intrenching, and for use in bivouac and garrison. It can be used as a hatchet in cutting small brush.

It combines, in one tool, the spade, pick, and hatchet, with which it practically dispenses, besides being a weapon.

For service on the plains it is invaluable. I am in favor of its adoption.

THOS. M. WOODRUFF,
2d Lieut. 5th Infantry.

[For adoption.]

Having seen the “trowel bayonet” used in several of the companies of my regiment, I am thoroughly convinced that the adoption of it in the Army would be amply repaid by the assistance it would render troops in time of active warfare.

It is excellent as an intrenching tool, and, as a weapon, equal, if not superior, to the bayonet now in use.

FRANK S. HINKLE,
2d Lieut. 5th Infantry.

[For adoption.]
In my opinion it is a great and much needed improvement on the old style of bayonet. I am led to this conclusion from seeing the novel expedients that the infantry resorted to during the war, to cover themselves from the fire of the enemy; they often using jack-knives, old canteens, belt-plates, tin cups, etc., to scrape out a hole, or throw up enough dirt to shield them from the enemy's fire. I think it would be to the best interest of the Army to have the trowel bayonet adopted by the War Department.

J. J. LAMBERT,
Lieut. 5th Infantry.

[For adoption.]
Office of the Board on Breech-loading Small Arms,
February 4, 1873.

The Honorable the Secretary of War:

[Through the Adjutant-General U. S. A.]

Sir,—Herewith I have the honor to forward the record, with accompanying documents and photographs, of the Board for the selection of a breech-system for muskets and carbines, so far as it concerns the special subject of trowel bayonets referred to it by your indorsement of July 27, 1872.

Very respectfully,

Your obedient servant,

ALFRED H. TERRY,
Brigadier-General.

Office of the Board on Breech-loading Small Arms.

Present: All the members and the Recorder.

The following opinions were then read, and ordered to be incorporated with the Record:

I think that the day of the bayonet has passed away; just as the pike yielded to the muzzle-loading firearm with the bayonet, so this latter must yield to the breech-loading arm without the bayonet. While, however, this is my belief, I do not think it prudent to definitely abandon the weapon until actual experience in war shall demonstrate that it is no longer of use. The same improvements in firearms which rendered the bayonet useless make an intrenching tool for each man a necessity; but they also call for increased mobility of troops, and to this end render it necessary that the weight of the soldier's equipment shall be diminished rather than increased. If, then, an intrenching tool be added to the equipment, something else
should be taken from it. I think there is no part of it which can be so well spared as the bayonet, and notwithstanding my opinion that prudence requires that the bayonet should be retained until experience shall demonstrate that it is valueless, if it were necessary to dispense with it in order that an intrenching tool might be carried, I should advocate its abandonment. The trowel bayonet, however, if it be efficient in both capacities, spares us the necessity of making a choice between the two. I frankly confess that when it was first presented to the Board, I thought it, as an intrenching tool, a mere toy; but the experiments with it which we have seen have convinced me that in this respect it is exceedingly efficient. I am satisfied that troops provided with it can completely shelter themselves from musketry-fire in a very few minutes — so shelter themselves that with good breech-loading arms their position will be nearly impregnable. As a bayonet, while it is not suited to practice in the fencing schools, it will, I think, be as efficient as any weapon of the kind in the rough-thrusting of actual conflict.

I cannot attach much importance to the principal objection urged against its adoption — that its use will detract from the military appearance of troops. We are in search of the useful, not the beautiful, and it can and always should be worn sheathed; never fixed, except it be needed as a bayonet in action, should such a contingency occur.

In order, then, that without sensibly increasing the weight of the soldier’s equipment he may carry both a bayonet and an intrenching tool, I vote to recommend the adoption of Rice’s trowel bayonet.

ALFRED H. TERRY,
Brigadier-General.

Colonel Hagner desires to state, in explanation of his vote, that he does not consider it advisable or necessary to attach a tool of this description to the rifle-musket.

As the most important and costly article of the soldier’s
equipment, the gun requires constant care to keep it in good order, and particularly to protect it from the slightest injury affecting its accuracy; hence to use it, for any purpose, by authority, increasing the risk to such injuries, does not seem to be proper, unless decidedly necessary.

The use for which the trowel is intended must soon injure its appearance and make it unsuitable to be attached to a well-kept rifle-gun; hence, if the soldier is authorized to subject this part to rough usage, he will be apt to be less careful of other parts of the arm.

As no advantage is claimed in the use either of trowel or gun from the incongruous combination, it seems that the above consideration should outweigh the slight inconvenience of increasing by a few ounces the soldier's load.

Hence, Colonel Hagner would recommend the use of a suitable earth-trowel with a wooden handle to be carried attached to the valise of the infantry-soldier, and to retain for the gun a bayonet of the present universally approved pattern, but reduced in length of blade to about twelve inches, as the present length is no longer deemed necessary.

P. V. HAGNER,
Colonel of Ordnance.

The trial of Rice's trowel bayonet before the Board has convinced me of the great value of a light intrenching tool in the hands of each soldier; but I am not at all satisfied that we should not spoil the bayonet and adopt an inferior intrenching tool by trying to combine the two. I should much prefer to recommend that the present triangular bayonet be retained and a light steel intrenching tool, with wooden handle and of an improved pattern, be issued to each enlisted man of infantry, artillery, and engineers as part of his equipment. I therefore vote against the adoption of Rice's trowel bayonet.

H. B. CLITZ,
Col. 10th Infantry.
The experiments made with the trowel bayonet before the Board, under the supervision of Colonel Rice, the inventor, show conclusively its great value as a means of providing men with cover promptly, an indispensable condition when the accuracy and range of the armaments of the present day are considered. It is surely as effective as an offensive weapon as the old one.

No other objections than an unsightly appearance, the possible chance of the soldier bending his gun-barrel, and the inability to stack arms, can be urged against it. The first is too trivial to consider; the second is proved by experiment to be unfounded, as the bayonet works better in the hand than on the gun (see record), and the third is easily obviated by a simple device of Mr. Merrill, to attach a small iron hook to the upper band of each gun, to be hooked into the swivels of the two remaining guns necessary to complete the stack. But in any event, in my opinion, its value as a means of providing shelter in a short space of time outweighs the objections.

I am not in favor of adding weight to what the soldier already carries, as is proposed by attaching a trowel to the knapsack, as the necessity for increased mobility of troops, if possible, is well recognized.

*Small Arms Board, Oct. 17, 1872.*

The weapon was placed in the hands of three men who were detailed for that purpose. By direction they dropped upon their right knee, and, holding the socket of the instrument with both hands, they thrust it into the earth, seven to eight inches, rapidly pressing it to the right, then to the left, the point of the bayonet acting as a fulcrum, cutting the sod for a distance of twelve to fourteen inches, and then pushing the weapon under the sod cut; they loosened it from the earth; by continually stepping backward, and repeating the operation described, they loosened the soil for a space of five feet ten inches square. After piling up the sods in front of the trench dug, they grasped the socket with the right and the point of the bayonet with the left hand, and, holding the instrument in this manner, drew the loosened earth forward, throwing it upon and over the sods, forming a breast-work five feet long, three feet thick at the bottom, one at the top, and nineteen inches high; "time, four minutes." The soil was very hard, not having been disturbed for over twenty years, besides being full of roots, but the wedge-shaped of the bayonet parted and drew the earth out from between them. In the second trial, which was in easier digging, from the experience they had just received, the men handled the weapon much better, so that in the short space of two minutes and three-quarters they dug a trench six feet square, throwing the earth up in front in the same manner as in the first trial, forming a half-proof embankment six feet six inches long, nineteen and one-half inches high, three feet thick at the base, and one on the top, behind which the three men were directed to lie down, when they were so concealed that they could not be seen at the short distance of ten paces. This is making cover in a much less period of time than entrenching tools could be ordered and brought from the rear to the front of an army. One of the bayonets was then fixed upon a musket, and on attempting to dig with it proved that the length of the piece caused the weapon to hang at such an angle that the earth could not stay upon it, which demonstrated the fact that the soldier could not, if he would, use the bayonet as an entrenching instrument when fixed upon the gun. Three men undoubtedly worked as rapidly as possible, but no faster than they would if under fire, and their lives depended upon the rapidity of their labors.
A majority of officers under whose supervision this bayonet has been tested agree in giving it a decided preference. I vote for the adoption of the bayonet.

M. A. RENO,
Major 7th Cavalry.

I strongly recommend the adoption of Rice's trowel bayonet for the use of the Army, to substitute the bayonet now in use.

L. L. LIVINGSTON,
Capt. 3d Artillery.

The following resolution was then passed:

Resolved, That the Board recommend to the War Department that Rice's trowel bayonet be adopted for the use of the military service.

ALFRED H. TERRY,
Brigadier-General.

P. V. HAGNER,
Colonel of Ordnance.

H. B. CLITZ,
Colonel 10th Infantry.

M. A. RENO,
Major 7th Cavalry.

L. L. LIVINGSTON,
Capt. 3d Artillery.

HENRY METCALFE,
Second Lieut. Ordnance,
Recorder.

Ordnance Office, March 6, 1873.

Respectfully returned to the Secretary of War, with the recommendation that ten thousand of these trowel bayonets be made and issued to the troops for trial. They should be fully tested, and the results reported to this Bureau.
It is further recommended that an equal number of intrenching-tools be made, to be carried by the soldiers, and to be tried in comparison with the trowel bayonet. To prevent any possibility of the use of the trowel bayonet for intrenching purposes, when fixed, instructions should be given that the trowel bayonet should be worn habitually in the scabbard, and only be fixed when emergency necessitates its use as a weapon.

By order of the Chief of Ordnance.

S. V. BENÉT,  
Major of Ordnance.

Approved by the Secretary of War, March 7, 1873.  
H. T. CROSBY, Chief Clerk.

WAR DEPARTMENT, Adjutant-General’s Office,  
WASHINGTON, March 12, 1873.

Respectfully returned to the Chief of Ordnance, inviting attention to the action of the Secretary of War endorsed hereon, and with request that the papers be returned to this office with report of action taken by the Ordnance Bureau.

E. D. TOWNSEND,  
Adjutant-General.

Summary, showing number of Rice Bayonets manufactured at the National Armory, Springfield, Mass., and issued to the U. S. Army, pursuant to recommendations, as follows:—

In 1868. To Battalion Engineers, U. S. A., 200
In 1871. To 3d and 5th Regiments Infantry, 500
In 1874. To Troops in the military service U. S. A., 10,000

Recommendations of the respective Boards concurred in by Chief of Ordnance, and ordered by the Secretary of War.
RICE BALONET WITH IMPROVED HANDLE. MODEL 1872.
WARD-BURTON MILITARY MAGAZINE MUSKET, WITH RICE BAYONET.
Col. Rice recommends that the Elcho Saw-Bayonet, which has a cutting edge in front and saw on back of blade, be issued to the sergeants or non-commissioned officers of a regiment, and the Rice Trowel Bayonet, which is an intrenching-tool and weapon, be issued to the men in the ranks. Handles for both these bayonets should be like those on sabre bayonets.
CROSS SECTIONS OF SHELTER-TRENCHES.
Scale of 5 feet to an inch.

AT WORK.
ONE RANK KNEELING IN TRENCH, AND FILE-CLOSERS LYING DOWN IN REAR.

SHELTER-PIT FOR SKIRMISHERS.
STACKING

HOOKS AND SWIVELS

FOR

RIFLES, MUSKETS AND CARBINES.
RICE-MERRILL AND RICE-METCALFE HOOKS AND HOOK-SWIVELS.

U. S. Springfield Rifle Upper Band, full size, adopted for the Regular Army and Militia of the United States.

The above cut represents the U. S. Springfield Rifle Upper Band — half size. A is a view of the band complete, seen from above; B, one of the creases; C the lug, through which are two holes (D and E) for the stacking swivel (G) and the gun sling swivel (F), respectively. These two swivels are grooved (H H) for the swivel pin (I), which keeps them in place. This upper band serves to bind together the barrel and stock, to secure the ramrod in place, as a point of attachment for the gun sling, and
The above cut represents the U.S. Springfield Carbine Lower Band, Model 1874, half size. It is provided with a hook-swivel for stacking, as in the upper band of the musket already described. A is a view of the band seen from above. B is one of the "creases." C the "lug" through which the hook-swivel (D) passes. The swivel is secured by a small headless screw, which is riveted into place through the back of the lug.
Carbine hook—swivel—half size.

Carbine stacking hook—half size—model 1873. A. Metal case fastened in the stock of the gun to receive the hook. B. Spring to keep hook in place. C. Stacking hook.

Pursuant to recommendation of Chief of Ordnance, approved by the Secretary of War, all small arms manufactured at National Armory, Springfield, Mass., will hereafter be provided with the Rice-Metcalf stacking-swivel.

March 13th, 1874.