11-3-1849

Message from the President of the United States to the two Houses of Congress, at the commencement of the first session of the Thirty-first Congress: Secretary of War, War Department, 1849.

Follow this and additional works at: https://digitalcommons.law.ou.edu/indianserialset

Part of the Indian and Aboriginal Law Commons

Recommended Citation
LIST OF DOCUMENTS

ACCOMPANYING THE REPORT OF THE SECRETARY OF WAR TO THE PRESIDENT.

I.—Correspondence, &c., upon subjects particularly adverted to by the Secretary.

1. Letter from Major General Scott.
2. Reports of operations in New Mexico.
3. Reports of operations in Florida.
4. Reports of operations in Texas.
5. Instructions relative to surveys west of the Mississippi.
6. Instructions and reports relative to affairs in California.

II.—Annual reports from bureaus of the department.

No. 1.

LETTER FROM MAJOR GENERAL SCOTT.

HEADQUARTERS OF THE ARMY,
New York, November 3, 1849.

Sir: As the usual period is at hand for the annual report, by the War Department, on the state of the army, I suppose it to be due from my position, though not prescribed by regulations, that I should offer such professional suggestions as may seem worthy of attention in the preparation of that report.

Considering the present distribution and employment of the army, it would be quite a misnomer to call it a peace establishment. About four-fifths of the regiments or companies are, under threats of hostilities, in a state of constant activity or alert on our Indian borders, in Florida, Texas, New Mexico, California, and between the basin of the Mississippi and the Rocky mountains, including the long lines of emigration across those mountains and the removal of the Menomones from Wisconsin. The small number of remaining companies furnish most inadequate peace garrisons to a few only of the many fortifications of great cost and importance along the British North American, the Atlantic, and Gulf of Mexico frontiers.

Whilst by acquisitions of territory the exterior line of the United States has, since 1844, been extended rather less than 1,000 miles, the interior or Indian lines to be guarded, consequent on new settlements and the continued streams of emigration to the west, have been increased at least 10,000 miles. On a careful examination, this estimate will not be found extravagant. Our troops, accordingly, have already been carried, or soon must be carried, into near proximity, and with danger of conflict at every point, to five times the former number of warlike Indians who were our close neighbors. Add the treaty obligation to protect the republic of Mexico from the savage tribes within our limits, and some idea may be formed of the increase of active duty thrown upon the existing military establishment—including regiments, generals, and general staff officers.

For this immense excess of duty over that of any other period of peace known in our history, we have only fifteen regiments, with 651 enlisted men belonging to the Engineer and Ordnance departments—presenting a nominal total of 9,438 non-commissioned officers, musicians, artificers, and privates, or less than the total of the peace establishment of 1815 by 2,499.—See the last Army Register, (January 1, 1849,) p. 38, and American State Papers, (Military Affairs,) vol. 2, p. 46.

The total of the present establishment, like that of 1815, can be considered only as nominal, except as fixing a maximum not to be exceeded; but place the maximum total at any given point, and the numbers actually enrolled and in pay under the establishment will always be from a fourth to a third less. Thus, under the total of 1815—11,937 enlisted men—the average number on the rolls, or receiving pay for five years, was but
8,146.—See table, page 38, in the volume of State Papers cited above. And I have no doubt the deficiency under the present establishment—9,438 enlisted men—is, proportionally, yet greater. This may easily be ascertained by means of the rolls in the Adjutant General’s and Paymaster General’s offices at Washington.

Whence this striking difference between the authorized and the actual numbers receiving pay at any given time?

It arises from, 1st, the absolute necessity of never exceeding, by recruiting, the total fixed by law; and, 2d, the unavoidable delays in receiving, at Washington returns of deaths, discharges, and desertions occurring at distant posts and on distant routes—by which casualties the recruiting service is regulated. As distances increase, and particularly over routes barely practicable, so will be the increased delays and the falling off from the maximum total allowed by law.

Assuming, then, with confidence, that of the present authorized total—9,438 non-commissioned officers, musicians, artificers, and privates—there are actually not more than 7,000 in service and receiving pay, including the sick and the few who are always on short leaves of absence, it is evident that the army is now greatly below the pressing wants of the country. In other words, to meet those wants, I am fully persuaded, on the experience of the last twelvemonth, that the total of enlisted men ought to be nearly doubled, independent of any danger, near or remote, of aggression from abroad.

The desired augmentation may be attained either wholly by new regiments, or the addition of privates to companies throughout the present regiments. Either plan by itself would be liable to serious objections. By doubling the present *skeleton* regiments, we should have some 500 regimental officers and 1,516 non-commissioned officers, musicians, and artificers more than are deemed absolutely necessary; and by extending the number of privates, per company, much beyond 80, companies would be rendered unwieldy, besides making it necessary to add to each a lieutenant and several non-commissioned officers for the command, the care, and instruction of so many men. I submit, therefore, a combination of the two plans, of which the following are the details:

Extend the number of privates in every company of the present 15 regiments to 84. The number now limited is 42 in the artillery and infantry companies, 50 in the dragoons, and 64 in the mounted riflemen. (See Army Register, p. 38.) Those regiments would then stand—

<table>
<thead>
<tr>
<th>Regiments</th>
<th>Companies</th>
<th>Total Privates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two regiments, or 20 companies, of dragoons—present total</td>
<td>-</td>
<td>1,230</td>
</tr>
<tr>
<td>Add 34 privates to each company</td>
<td>-</td>
<td>680</td>
</tr>
<tr>
<td>One regiment, or 10 companies, of mounted riflemen—present total</td>
<td>-</td>
<td>765</td>
</tr>
<tr>
<td>Add 20 privates to each company</td>
<td>-</td>
<td>200</td>
</tr>
<tr>
<td>Four regiments, or 48 companies, of artillery—present total</td>
<td>-</td>
<td>2,600</td>
</tr>
<tr>
<td>Add 42 privates to each company</td>
<td>-</td>
<td>2,016</td>
</tr>
</tbody>
</table>

**Totals:**

1,230 680 765 200 2,600 2,016

4,616
Eight regiments, or 80 companies, of infantry—present total 4,192
Add 42 privates to each company 3,440
Engineer and ordnance enlisted men as at present 651

Deduct the total (9,438) of the present establishment, and we should have an augmentation of 6,336 privates, without the addition of one officer, non-commissioned officer, musician, or artificer.

Add a 2d regiment of mounted riflemen, organized as above 965
Add a 9th regiment of infantry, organized as above 954
Add 2 companies of artillery to the present 48, and organize the 50 into five regiments instead of four—one for the Pacific coast. The two companies, organized as above, would give a total of 192
Add the non-commissioned staff of the 5th artillery 2
Add a permanent detachment for cavalry and artillery purposes at the military academy, of 4 sergeants, 4 corporals, 2 musicians, and 50 privates—total 60
Add a like detachment for the general recruiting depot in the harbor of New York 60

Grand total 18,007

(The detachments permanently on duty at those posts have heretofore been deducted from the feeble totals of regiments.)

Thus, Congress might nearly double the present grand total (9,438) of the army, with an addition of only 81 commissioned officers. These would be 3 colonels, 3 lieutenant colonels, 6 majors, 22 captains, 25 first lieutenants, and 22 second lieutenants.—See, again, tables, p. 38, Army Register.

A nominal total of 18,000 enlisted men, deducting between a fourth and a third for unsupplied deaths, discharges, and desertions, as explained above, would give a yearly average on the pay-rolls of about 13,000. Deduct another thousand for recruits at depots and in transition, and we should not have permanently with regiments or companies more than 12,000; and from this number we would again, to find the effective strength at any given time, have to deduct the sick, the convicts, prisoners for trial, and about one in a hundred on short leaves of absence. Considering the many sickly lines and posts occupied and to be occupied, it is not extravagant to say that we should in no year, under the proposed maximum, have an average of more than 55 non-commissioned officers, musicians, artificers, and privates per company, or a grand total of 10,000, "present and fit for duty," for a prodigious amount of service, and covering an area equal (less about an eighth) to the entire continent of Europe.

In foreign armies, the regiment or battalion is the unit, but very rarely broken into detachments. With us, on the other hand, many of our smaller posts, in time of peace, have been, and must continue to be, oc-
cupied by single companies. Hence, in the United States the company is generally the unit; and this, from its smallness, even with a total of sixty "present and fit for duty," is, practically, indivisible for more than momentary detachments.

Confident that the foregoing calculations and estimates are without any material error, I hope the proposed augmentation may be substantially recommended by the War Department.

There is one other topic I take the liberty to present in this volunteer communication—one in which the entire army feels a lively interest, and which, we all hope, may again win the support of the department. The following extract from my annual report, addressed to the Secretary of War, November 20, 1845, presents, in a short compass, the subject in question:

"I venture, once more, respectfully to invite attention to a retreat or asylum for the worn-out or decayed rank and file of the army. The subject has been twice reported upon favorably, with bills, by Committees on Military Affairs in the House of Representatives. (See report No. 74, 2d session 26th Congress, and report No. 109, 2d session 28th Congress.) If the want can only be placed fully before Congress, it seems impossible to doubt success, as the asylum would impose no burden on the treasury, but be supported from the army itself, in deductions, fines, and reversions."

For the merits and details of the proposed asylum, I beg that the documents referred to in the extract may be carefully examined. I cannot possibly conceive a valid objection to either.

While the army under my command lay at Puebla, a part of the summer of 1847, an humble petition to Congress in favor of an asylum, on the same plan, for the benefit of enlisted men, was drawn up and signed by, I believe, every commissioned officer then present. I presume it was presented; and if so, it may, no doubt, be found in the archives of one or both houses of Congress.

In connexion with that petition, I beg to add the following facts:

On the capture of the city of Mexico, by the same army, I levied a contribution upon the inhabitants of $150,000, in lieu of pillage, to which the city, by the usages of war, was, under the circumstances, liable. In my orders on the subject, I said:

"Of the whole contribution to be paid over to the army, twenty thousand dollars shall be appropriated to the purchase of extra comforts for the wounded and sick in hospital; ninety thousand dollars to the purchase of blankets and shoes for gratuitous distribution among the rank and file of the army; and forty thousand dollars reserved for other necessary military purposes." (See, in the Adjutant General's office, at Washington, a printed copy of that General Order, No. 287, dated September 17, 1847.)

I also copy here, as intimately connected with the same subject, my letter to the Secretary of War, dated at Mexico, February 6, 1848. In that letter, I said:

"I have not reported on the subject of secret disbursements since I left Jalapa—1st, because of the uncertainty of our communications with Vera Cruz; and, 2d, the necessity of certain explanations, which, on account of others, ought never to be reduced to writing. I may, however, briefly add, that I have never tempted the honor, conscience, or patriotism of
any man, but have held it lawful in morals, as in war, to purchase valuable information or services voluntarily tendered me.

"Charging myself with the money received at Washington, for the purposes indicated—the $150,000 levied upon this city for the immediate benefit of the army, in lieu of pillage; the proceeds of captured tobacco, taken from the Mexican government, [found in the capital]; and with some other small sums—all of which I shall strictly account for—I have, on the other hand, expended $63,745 50 in blankets and shoes, gratuitously distributed to enlisted men; $10,000 extra on account of hospitals, allowing $10 to every crippled man discharged or furloughed; some $60,000, I think, for secret services, including a native spy company, whose pay, commencing in July, I did not wish to bring into account with the treasury; and I enclose, herewith, a draft for $100,000, made up according to the memorandum also enclosed. I hope you will allow the draft to go to the credit of an army asylum, and make the subject known, in the way you may deem best, to the military committees of Congress. That sum is, in small part, the price of the American blood so gallantly shed in this vicinity; and, considering that the army receives no prize money, I repeat the hope that its proposed destination may be approved and carried into effect.

"Number one of the same set of bills is this day transmitted direct to the Bank of America.

"The remainder of the money in my hands, as well as that expended, I shall be ready to account for at the proper time, and in the proper manner, [this was done in 1848,] merely offering this imperfect report to explain, in the mean time, the character of the $100,000 draft." (See Executive document No. 60, page 1086, printed under a resolution of the House of Representatives of April 28, 1848.)

Following that letter will be found, printed, the memorandum and draft alluded to. The draft was made payable to me; and, in order to place the deposit beyond the control of any individual functionary whatever, I endorsed it—"The Bank of America will place the within amount to the credit of Army Asylum, subject to the order of Congress."

Advised as above, the Secretary of War, on the presentation for payment, caused the draft to be protested; whereby the sum of $100,000, turned over by me in cash to the military chest of the army, for the current pay of the troops, and paid out accordingly, was sequestered to the benefit of the United States treasury. Of course, an equal sum was saved to the treasury out of the appropriation made by Congress for the current pay of the troops.

That money never had belonged to the treasury, and the treasury had no legal claim to it whatever. Look at the memorandum that shows the items out of which the sum was made up—1st, $9,000 received for licences granted by my order, in the city of Mexico; 2d, $49,569 40 received for tobacco, belonging to the Mexican government, found in the capital; 3d, $38,780 16 taken from the contribution levied upon the capital; and, 4th, $2,650 40 saved at one of the principal army hospitals.

What claim had the United States treasury upon either of those items? They were all, except the fourth, or smallest item, raised according to the laws of war and the rights of conquest, for just and laudable objects, and applied, or attempted to be applied, accordingly.

The only title of legislation, by Congress, that then existed, will be
found in the 58th article of war, act April 10, 1806, copied and re-enacted from the resolves of the old Congress, September 20, 1776. (See Military Laws, pp. 23 and 116.) The article is in these words:

“All public stores taken in the enemy’s camp, towns, forts, or magazines, whether of artillery, ammunition, clothing, forage, or provisions, shall be secured for the service of the United States.”

This is the law which, from September, 1776, when the resources of the United States were low, down to the present time, has deprived our army of prize money—always allowed, on sea and land, abroad, and to our own navy. The law was strictly complied with by me, while commanding in Mexico, in respect to captured “artillery,” arms of every kind, “ammunition,” wagons, teams and pack-animals, “clothing,” “forage,” and “provisions,” (or subsistence;) but license-money, captured tobacco, (previously bought by the Mexican government for re-sale to its own people,) and contribution-money, are not enumerated in the law. Neither was the sum of $11,791 19, captured in a military chest at Cerro Gordo. The quartermaster and commissary departments being, however, without funds, I immediately turned over the whole of the money, on receipts, to them, for regular disbursement on account of the United States treasury.

It is thus shown that the treasury became possessed of $111,791 19, without any legal claim whatever. That large sum ought, therefore, to be considered as held in trust by the United States for some equitable purpose; and I again humbly petition that Congress may appropriate the whole to an army asylum, for the worn-out or decayed enlisted men (regulars and volunteers) yet in service, or who have been honorably discharged therefrom, notwithstanding the ex post facto act, chapter 126, approved March 3, 1849.

I have the honor to remain, sir, with high respect, your most obedient servant,

Hon. G. W. Crawford,
Secretary of War.

WINFIELD SCOTT.
HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fé, New Mexico, November 8, 1848.

Sr: I have the honor to inform you that the condition of this territory, since I assumed the duties of governor, on the 11th of last month, has been one of comparative peace and quietude.

With a view more effectually to secure the principal settlements against Indian incursions, and to obtain the necessary supplies of forage for the public horses, the following distribution of troops has been made: One company of the first regiment of dragoons at each of the towns of Taos, Albuquerque, and Socorro, with detachments of twenty and twenty-five men from the two latter stations to Tomá and Doña Anna—making, with Santa Fé, where there is one company of the third artillery and one of second dragoons, six military posts. It is believed that this arrangement of the regular troops will insure tranquillity on the part of the inhabitants, and hold all marauding bands in check, until our strength shall be augmented agreeably to the estimates and orders of the War Department.

The system of government now in force in New Mexico is that which was established in 1846, and embraces what is commonly termed Kearny's code, to which the people, through their representatives lately assembled in convention, have happily expressed their assent, as will be seen by their memorial to Congress, and is considered adequate to the wants of the country, until another can be provided. It is, however, very advisable, for many reasons, that the territorial laws which are designed to be permanent should go into effect as soon as possible.

The proceeds arising from the various sources of revenue will be insufficient to defray the expenses of the government, unless the import duty levied on merchandise, under the orders of General Price, should be collected. As it is understood that this subject has already been submitted to the President of the United States for his decision thereon, I would respectfully suggest, in the event of his granting the prayer of the petitioners to be released from its payment, that Congress be asked for an appropriation to supply the deficiency, which, up to the present date, is estimated at fifteen thousand dollars.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,
Brevet Lieutenant Colonel U. S. A., commanding.

To the Hon. W. L. MARCY,
Secretary of War, Washington, D. C.
Sir: I have the honor to acknowledge the following communications from the War Department, received by Mr. Beale, of the United States navy, who arrived here on the 26th December last, viz: Three from the Secretary of War, two of them dated the 12th and one of them the 13th October, 1848; and a copy of a letter addressed by the Secretary of State to William V. Voorhees, Esq., with a circular from the Treasury Department, both under date of the 7th of the same month. All of which communications, so far as they relate to the government of New Mexico, will be duly observed.

To avoid embarrassment in regard to recognizing the jurisdiction of the authorities of Texas over a large portion of this territory, it is very desirable that Congress should act in the matter before the demand is made.

In anticipation of instructions received, as before mentioned, I had, on arriving here, made such arrangement of the troops as was thought best calculated to insure the safety of the settlements. Since then, they have been actively employed at the various stations in pushing their scouts at the hostile or marauding bands of Indians, whenever approached within striking distance, and, up to this time, have protected the inhabitants from serious injury or depredation. Owing to the extent of the country to be guarded, and the unusual severity of the winter, this important end has not been accomplished without the most strenuous exertions, and much suffering on the part of those engaged in it. The four accompanying reports will show, to some extent, the nature of the service; while other scouts have been made, involving equal, if not greater endurance, where a written statement was deemed unnecessary. In all the field duty which has been required of our troops since my arrival in the territory, I am happy to add that it has been performed, by officers and men, with alacrity and zeal.

From indications given by many of the wild tribes within our out-borders, they are becoming convinced that the period has arrived when they must restrain themselves within prescribed limits, and cultivate the earth for an honest livelihood, or be destroyed. This subject will become one of serious interest with the government at home, and should be settled without delay. The particular location and extent of these limits, and the inducements held out for a change from their present roving habits to the pursuits of agriculture—from the savage state to that of civilization—are well worthy of early attention. Should the impressions already made be followed up and deepened on the arrival of a large force in the spring, as they doubtless will be, it is hoped that the day is not distant when all the Indian tribes will be readily induced to make or accede to such terms as the United States shall dictate. In regard to the release of captives, as prescribed by the late treaty of peace, nothing has been neglected to effect it as speedily as possible. Many have been restored to their homes in this territory, and others are still here, awaiting instructions from the republic of Mexico, to which they belong.

Mr. Beale, after refitting, proceeded to California on the 12th ultimo.
In consequence of ill health, and the recommendation of the attending surgeon, Brevet Captain Kilburn, of the third artillery, was permitted to accompany him.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,
Brevet Lieutenant Colonel U. S. A., commanding.

Brigadier General R. JONES,
Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, March 29, 1849.

SIR: Since I had the honor of addressing a communication to the War Department, in the early part of last month, some change has taken place in the aspect of our Indian relations in this territory. The depredations, which were but few, committed by these tribes during the fall and winter seasons, have, since the opening of spring, become of frequent occurrence; and were recently attended by the murder of some of our citizens in the neighborhood of San Fernando de Taos. To guard the settlements effectually against the repetition of such aggressions, the small regular force at my disposal has been found wholly insufficient. In order, therefore, to suppress them, and to meet the emergency before a widespread scene of havoc and ruin shall have marked the progress of the hostile and marauding bands over the territory of New Mexico, I have felt it my duty to call in an auxiliary force of volunteers, as will be seen by the Order herewith enclosed, and which, I trust, as a measure of absolute necessity, will be approved by the President of the United States, and that corresponding instructions may be issued as soon as possible. Besides the protection thus afforded to the lives and property of the inhabitants, this increase of force was necessary to prevent the coalition designed, or to strike it down promptly after having actually been formed against us. With a band of the Eutaws, which is one of the most warlike and formidable tribes, and who have been engaged in perpetrating these outrages, a fight took place during the current month, in which a detachment of the first dragoons, under Lieutenant Whittlesey, of the same corps, acquitted itself handsomely, as will be seen by a copy of his detailed report herewith enclosed.

An express reached here on the 24th instant from Major General Worth, bringing his despatches, dated Galveston, January 10, 1849, whereby he assumes command of the eighth and ninth military departments; and on its return he has been made duly acquainted with the state of affairs in this territory. As it was the first intelligence received from the United States since the arrival of Mr. Beale, of the navy, on the 25th of December, although repeated efforts have been made to communicate across the plains, I have thought it advisable, as being, perhaps, the surest and speediest mode at present, to forward this package by the way of Texas.

It gives me pleasure to add, in conclusion, that the volunteers are flocking to their country's standard with a commendable zeal. On the 23d
instant, two companies, averaging eighty men, were enrolled, organized, and mustered into service at Santa Fe. The remaining three are expected soon to be ready.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Brigadier General R. Jones,
Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
[Orders No. 2.] Santa Fé, New Mexico, March 20, 1849.

I. In consequence of the non-arrival of the troops designated for the ninth military department, and the limited force now present, it becomes necessary to raise an additional military force for the protection of the property and lives of the inhabitants of the territory of New Mexico against the depredations of the marauding bands of Indians which infest it.

II. For the purpose specified above, the services of five volunteer companies will be received for six months, unless sooner discharged—three of the companies to be mounted.

III. The organization, pay, and emoluments of these companies will be the same as that established by the United States government for troops during the recent war with Mexico.

IV. No company of less than sixty privates will be received into the service.

V. As soon as any company shall have seventy-two or more enrolled, it will elect its officers and non-commissioned officers, and report to the commanding officer of the ninth military department, when the company will be mustered into service.

VI. One mounted company will be raised in the Rio Arriba, and rendezvous at Don Fernandez de Taos; one mounted company in the Rio Abajo, and rendezvous at Albuquerque, and one mounted and two foot companies at Santa Fé.

VII. Companies of less than one hundred will be officered by a captain and two subalterns; companies of one hundred or upwards, by a captain and three subalterns.

By order of Lieutenant Colonel Washington.

JOHN H. DICKERSON,
Lieutenant and Acting Assistant Adjutant General.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fé, New Mexico, May 25, 1849.

Sir: On the arrival of the troops from Fort Leavenworth, it is my present intention to discharge the four companies of volunteers which have been mustered into service; and it is earnestly hoped that the earliest measures may be taken for paying them for the time they shall have served. The prompt manner in which these troops were raised, has produced a most salutary effect upon the interests of this territory in many
respects. Whilst it has given confidence and tone to the feelings of the inhabitants, it has undeceived the neighboring tribes of hostile Indians in the idea, which seems to have been entertained by them, that they could war against one portion of the people, and perhaps be assisted in it by the other. They see an undivided front, and a people now, not as they once were, united and determined to revenge their wrongs, and all regarding as a common cause the aggressions committed against any portion of them.

The volunteer companies have done good service in the way of protecting the frontier settlements, which, but for their presence, must have been partially, if not wholly destroyed; and will, I trust, receive the consideration from the general government which they deserve.

Nothing has been heard of the Eutaws recently. They are reported to have retired far within their own borders; and without allies to aid them in prosecuting the war against us, are said to be much divided, even among themselves, in the expediency of carrying it on. It is probable that one good blow, struck in the heart of their country, will bring them to terms, and the sooner it can be done after the arrival of an adequate force, the better.

It will take some considerable time for the various Indian tribes inhabiting and adjacent to New Mexico, numbering at least twenty thousand warriors, to become acquainted with our national strength, and to learn the American character. Until this is accomplished, it will be vain to look for permanent peace. The means of doing it is by establishing a settled policy, and enforcing it by the most active and vigorous measures.

I am, very respectfully, your obedient servant,

J. M. WASHINGTON,

Major General Jones,
Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, June 4, 1849.

Sir: On the 30th ultimo, a large party of Apache Indians entered the valley of Abiqui and murdered a number of the inhabitants, amounting, it is reported, to not less than ten. Captain Chapman’s company of volunteers, which had been posted in the vicinity for the protection of that section of the territory, was absent at the time on a scout in search of the Eutaws. As soon as the facts of the outrage were made known to him, which was done by express on the same day, he immediately gave pursuit with forty of his men, and came upon the enemy on the following morning. After a sharp engagement, against greatly superior numbers, Captain Chapman succeeded in routing the Apaches, killing about twenty of them, and having three of his own men wounded—one mortally—and a servant boy killed.

From the enclosed report of the affair by the Captain himself, it will be seen that his officers and men conducted themselves gallantly on the occasion, and deserve much credit.

The latest accounts from the Eutaws, received yesterday, represent them as being inclined for peace; and, to effect that purpose, express a
willingness to surrender the perpetrators of the murders committed on the inhabitants of this territory within the last two months, and to restore all the captured property. Should they act in good faith, which is by no means certain, the war with them will cease.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Brevet Lieutenant Colonel U. S. A., commanding.

Major General Jones,

Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, July 7, 1849.

SIR: The hostile bands of Indians still continue to be troublesome to the frontier settlements of this territory. Within the last three weeks several of the inhabitants have been murdered by them, and a considerable quantity of their stock run off. In these outrages, which had been confined to the Eutaws and Apaches, the Navajoes and Comanches appear also to have been recently engaged. From their numbers and formidable character, greatly increased exertions have become necessary to suppress them, and renders it now probable that the services of the volunteers, which were raised in March and April, cannot be dispensed with so soon as was anticipated.

Captain Marcy and escort arrived from Fort Smith on the 28th ultimo, and will return agreeably to his orders as soon as the men and horses are sufficiently refreshed. The troops from Fort Leavenworth are expected to reach here on or before the 25th instant. Those destined to El Paso, from late accounts, to be there at this time, but their arrival has not been reported.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Brevet Lieutenant Colonel U. S. A., commanding.

Major General R. Jones,

Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 23, 1849.

SIR: I have the honor to enclose a report of Lieutenant Thomas, 3d artillery, in which he details two affairs between the troops under his command and the hostile Apaches, at Sierra del Sacramento, on the 19th of July, and appear to be highly creditable to both officers and men.

I also enclose a report from Brevet Major Steen, touching the same subject, and giving the particulars of a scout upon which he was ordered.

I cheerfully unite in the recommendations made of Lieutenant Thomas, his officers and men, for their meritorious conduct.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,


Major General Jones,

Adjutant General, Washington, D. C.
HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 23, 1849.

Sir: I have the honor to enclose a detailed statement from Captain Judd, 3d artillery, in which Lieutenant Burnside of the same regiment, and his command, are represented as having performed efficient services in an affair with the Apache Indians in the vicinity of Las Vegas on the 16th of August. The troops serving in New Mexico are entitled to much consideration for the prompt and cheerful manner in which they have performed their arduous duties, as well as for their conduct in chastising the hostile bands which infest it, on every occasion which has been presented.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Major General Jones,
Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 23, 1849.

Sir: I have the honor to inform you of my return to this place to-day, after an absence in the Navajoe country since the middle of August.

The vigilance and activity of our troops in protecting the inhabitants of the territory against the numerous bands of hostile Indians have been unceasing, and, with few exceptions, their efforts have been successful. The services rendered by the four companies of volunteers which were mustered in last spring have contributed largely towards this result; and as the time of their engagement draws to a close, I am reminded of the necessity of retaining those companies that are mounted, awhile longer. Not having, as yet, received a cent of pay, and there being no prospect of their receiving any before an appropriation is made by Congress, it may be difficult to obtain their consent to continue beyond their present term. I shall endeavor to secure their services for three months more, unless sooner discharged, and hope that the earliest measures will be taken for their payment.

A mounted force is much more efficient to operate against the Indians of this country than any other description of troops. Comparatively, infantry is but of little use. One thousand men, well armed and properly mounted, would soon put an end to Indian difficulties in this quarter; whereas, a continuance of the system of inadequate means to suppress them at once, may so augment the work as to cause an immense expenditure of life and money before it can be finally accomplished.

I have the honor to be, very respectfully,

J. M. WASHINGTON,

Major General R. Jones,
Adjutant General, Washington, D. C.
HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 24, 1849.

SIR: I have the honor to enclose a report from Brevet Major Steen, wherein it will be seen that a small dragoon force under his command defeated a large party of Apache Indians in an engagement near the copper mines, on the 16th of August. Our officers and men, in the habitual display of gallantry and good conduct in the face of an enemy, appear to have been more conspicuous than usual on this occasion, and are entitled to my warmest commendation.

Early in the affair, and after the Major had received a severe wound and become disabled in consequence of it, he was succeeded in command by Lieutenant Bryan, topographical engineers, whose conduct is spoken of in terms of high compliment. For gallant and meritorious conduct I would beg leave to bring these officers to the notice of the President.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Major General R. Jones,
Adjutant General, Washington, D. C.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 25, 1849.

SIR: I have the honor to report that, in consequence of the Navajo Indians having committed numerous acts of aggression on the lives and property of the inhabitants of New Mexico, I determined to make a campaign against them with such available force as was at my disposal. Accordingly, the two companies of the 2d artillery and four companies of the 3d infantry, with one mounted company of territorial militia and one of Pueblo Indians, were ordered to rendezvous at Jemez by the 19th of August. As it was necessary to move with expedition, and there being no known practicable wagon route, I decided, after disencumbering the troops of tents and other heavy baggage, to proceed as light as possible, using pack-mules as the means of transportation. Arrangements to that effect being completed, I left Jemez on the 22d for the canon of Cheille, which is considered the stronghold and heart of the Navajo nation, my entire force consisting of companies B and D, 2d artillery, (55 men) under command of Brevet Major Kendrick; companies D, E, F, and H, 3d infantry, (123 men) commanded by Brevet Captain Sykes; a portion of Captain Dodge's company of foot volunteers (50 men) taken from the garrison at Jemez, and a mounted force of 120 militia and Pueblo Indians, called out for the occasion. The artillery took with them one six-pounder and three mountain howitzers. Lieutenant Dickerson, 1st artillery, acting assistant adjutant general, Assistant Surgeon Hammond, and Lieutenant Simpson, topographical engineers, accompanied the expedition. Colonel Calhoun, Indian agent for New Mexico, also accompanied me. After marching over a barren, badly watered, and, in many places, rough country for eight days, I arrived in the vicinity of the labores or cornfields of the Navajoes, at Tuna Cha. Here I first met with the Indians, and on the next day a party of them was fired upon by our troops, which resulted in killing and wounding several of them. Among the dead of the enemy
left on the field was Narbona, the head chief of the nation, who had been a scourge to the inhabitants of New Mexico for the last thirty years. Having, previously to my departure from Santa Fe, ordered a detachment of dragoons from that section, in a certain contingency, to join me at the cañon of Cheille by an upper route, I deemed it proper after this affair to make no unnecessary delay in effecting a junction. The command, therefore, proceeded, and, without any important occurrence on the way, reached the designated point at the mouth of the cañon of Cheille on the evening of the 6th of September. The dragoons had not arrived, and, from reliable information obtained afterwards, had never marched in that direction. Finding ourselves now in a fertile valley, in the midst of extensive fields of well cultivated and ripening corn, an opportunity was presented to recruit our exhausted animals, which had moved over a distance of two hundred and seventy-six miles. On the following morning the principal chief of the Navajoes, who said his acts were binding upon the whole nation, entered my camp, attended by subordinates, and sued for peace, which was granted on conditions set forth in the enclosed treaty. Three captives, youths that had been taken by these Indians from New Mexico, and a portion of the property of which the settlements had been plundered, were delivered up on the day of making it. The murderer of an inhabitant of New Mexico, who was demanded, was not then, nor had he been for some time, in the country, but would be delivered at Santa Fe as soon as found. The remaining captives and property to be brought to Jemez in thirty days from the date of the treaty. The main objects of the campaign having been accomplished, it was determined to return by way of the Zuni and Laguna pueblos, and the march was resumed accordingly on the 10th. After passing over a better country in every respect, although the distance is rather greater than on the other route, the command arrived at Albuquerque, on the Rio Grande, on the 21st inst., when the expedition was considered at an end. The route I pursued on going to Cheille would be impracticable at many seasons of the year, owing to there being no permanent water.

I am indebted to the officers and men of my command for the alacrity and zeal with which they performed their duties. Any duty, however laborious and fatiguing, was discharged willingly, and with cheerfulness. The labor of the artillery was unceasing. The pieces with drag-rope were hauled by the men over places where pack-mules went with difficulty, and so quickly as to cause little or no delay to the column.

The estimated number of the Navajo tribe is from seven to ten thousand, of which between two and three thousand are warriors, who are almost invariably well mounted, and generally well armed with guns, lances, and bows and arrows. To secure a firm and durable peace with them, it will be necessary to plant a military post in their country. Tuna Cha or Sienega Grande will afford eligible sites for this purpose.

During the time I remained in the neighborhood, a reconnaissance of the celebrated cañon of Cheille was made by Lieutenant Simpson, the details of which will accompany his report and map of route as soon as they can be completed.

I have the honor to be, very respectfully, your obedient servant,

J. M. WASHINGTON,

Major General R. Jones,
Adjutant General, Washington, D. C.
Treaty between the United States of America and the Navajo tribe of Indians.

The following acknowledgments, declarations, and stipulations have been duly considered, and are now solemnly adopted, and proclaimed by the undersigned; that is to say: John M. Washington, governor of New Mexico, and lieutenant colonel commanding the troops of the United States in New Mexico, and James S. Calhoun, Indian agent, residing at Santa Fe, in New Mexico, representing the United States of America; and Mariano Martinez, head chief, and Chapitone, second chief, on the part of the Navajo tribe of Indians.

The said Indians do hereby acknowledge that, by virtue of a treaty entered into by the United States of America and the United Mexican States, signed on the second day of February, in the year of our Lord eighteen hundred and forty-eight, at the city of Guadalupe Hidalgo, by N. P. Trist of the first part, and Luis G. Guevas, Bernardo Couto, and Miguel Atristain, of the second part, the said tribe was lawfully placed under the exclusive jurisdiction and protection of the government of the said United States, and that they are now, and will forever remain, under the aforesaid jurisdiction and protection.

2. That from and after the signing of this treaty, hostilities between the contracting parties shall cease, and perpetual peace and friendship shall exist, the said tribe hereby solemnly covenanting that they will not associate with, or give countenance or aid to any tribe or band of Indians, or other persons or powers who may be, at any time, at enmity with the people of the said United States; that they will remain at peace, and treat honestly and humanely all persons and powers at peace with the said States; and all cases of aggression against said Navajoes by citizens or others of the United States, or by other persons or powers in amity with the said States, shall be referred to the government of said States for adjustment and settlement.

3. The government of the said States having the sole and exclusive right of regulating the trade and intercourse with the said Navajoes, it is agreed that the laws now in force regulating the trade and intercourse, and for the preservation of peace with the various tribes of Indians under the protection and guardianship of the aforesaid government, shall have the same force and efficiency, and shall be as binding and as obligatory upon the said Navajoes, and executed in the same manner, as if said laws had been passed for their sole benefit and protection; and to this end, and for all other useful purposes, the government of New Mexico, as now organized, or as it may be by the government of the United States, or by the legally constituted authorities of the people of New Mexico, is recognised and acknowledged by the said Navajoes; and for the due enforcement of the aforesaid laws, until the government of the United States shall otherwise order, the territory of the Navajoes is hereby annexed to New Mexico.

4. The Navajo Indians hereby bind themselves to deliver to the military authority of the United States in New Mexico, at Santa Fe, New Mexico, as soon as he or they can be apprehended, the murderer or murderers of Micento Garcia, that said fugitive or fugitives from justice may be dealt with as justice may decree.

5. All American and Mexican captives, and all stolen property taken
from Americans or Mexicans, or other persons or powers in amity with the United States, shall be delivered by the Navajo Indians to the aforesaid military authority at Jemez, New Mexico, on or before the ninth day of October next ensuing, that justice may be meted out to all whom it may concern; and also all Indian captives and stolen property of such tribe or tribes of Indians as shall enter into a similar reciprocal treaty, shall in like manner, and for the same purposes, be turned over to an authorized officer or agent of the said States by the aforesaid Navajoes.

6. Should any citizen of the United States, or other person or persons subject to the laws of the United States, murder, rob, or otherwise maltreat any Navajo Indian or Indians, he or they shall be arrested and tried; and, upon conviction, shall be subjected to all the penalties provided by law for the protection of the persons and property of the people of the said States.

7. The people of the United States of America shall have free and safe passage through the territory of the aforesaid Indians under such rules and regulations as may be adopted by authority of the said States.

8. In order to preserve tranquillity, and to afford protection to all the people and interests of the contracting parties, the government of the United States of America will establish such military posts and agencies, and authorize such trading-houses, at such time and in such places as the said government may designate.

9. Relying confidently upon the justice and the liberality of the aforesaid government, and anxious to remove every possible cause that might disturb their peace and quiet, it is agreed by the aforesaid Navajos that the government of the United States shall, at its earliest convenience, designate, settle, and adjust their territorial boundaries, and pass and execute in their territory such laws as may be deemed conducive to the prosperity and happiness of said Indians.

10. For and in consideration of the faithful performance of all the stipulations herein contained by the said Navajo Indians, the government of the United States will grant to said Indians such donations, presents, and implements, and adopt such other liberal and humane measures, as said government may deem meet and proper.

11. This treaty shall be binding upon the contracting parties from and after the signing of the same, subject only to such modifications and amendments as may be adopted by the government of the United States; and finally, this treaty is to receive a liberal construction at all times and in all places, to the end that the said Navajo Indians shall not be held responsible for the conduct of others, and that the government of the United States shall so legislate and act as to secure the permanent prosperity and happiness of said Indians.

In faith whereof, we, the undersigned, have signed this treaty and affixed thereunto our seals, in the valley of Cheille, this the ninth day of September, in the year of our Lord one thousand eight hundred and forty-nine.

J. M. WASHINGTON,
Brevet Lieut. Colonel, commanding.

JAMES S. CALHOUN,
Indian Agent, residing at Santa Fe.
his

MARIENO MARÍNTEZ, Head chief.
mark.
CHAPITONE, his Second chief mark.
J. L. COLLINS.
FRANCIS CONKLIN.
LORENZO FORCE, his mark.
ANTONIO SAUDOVAL, his mark.
FRANCISCO JOSTO, Governor of Jemez mark.

Witnesses:
H. L. KENDRICK, Brevet Major, United States Army.
J. N. WARD, Brevet Lieutenant, 3d Infantry.
JOHN PECK, Brevet Major, United States Army.
G. F. HAMMOND, Assistant Surgeon, United States Army.
H. L. DODGE, Captain commanding Eutaw Regt.
RICHARD H. KERN.
J. H. NONES, Second Lieutenant, 2d Artillery.
CYRUS CHOICE.
JOHN H. DICKERSON, Second Lieutenant, 1st Artillery.
W. E. LOVE.
JOHN G. JONES.
J. H. SIMPSON, First Lieutenant, Corps Topographical Engineers.

HEADQUARTERS NINTH MILITARY DEPARTMENT,
Santa Fe, New Mexico, September 27, 1849.

Sir: I have the honor to enclose a report from Brevet Captain Judd, giving the particulars of an affair which occurred on the night of the 8th instant between a portion of Captain Papin’s company of Mexican volunteers and a band of marauding Apaches in the neighborhood of Las Vegas. For their activity and gallantry in the pursuit and attack of the Indians these troops deserve great credit, and give an earnest of what services may be expected from the natives of New Mexico in case of need.

I have the honor to be, very respectfully, your obedient servant,


Major General JONES, Adjutant General, Washington, D. C.
OPERATIONS IN FLORIDA.

FORT BROOKE, FLORIDA,
July 23, 1849.

GENERAL: On June 25th I reported that I should, as early as possible, make another attempt to open communications with the Indian chiefs; and I now have the honor to report the result. I left for the south in a small sloop on June 30, and returned on July 21, having visited Sarsota, Charlotte Harbor, the mouth of Pea river, and ascended the Caloosa Hatchee some 20 miles, or as high as navigable by sail vessels.

Near the mouth of Pea river I found, on July 6th, a party of the Marco Indians, consisting of their chief, Ishmatee, four men, eight women, and a number of children. They were friendly and cordial. When I offered them some presents they hesitated, saying it was against their laws to accept anything (except tobacco and whiskey, I believe) from our government, and that Sam Jones would kill them if he heard of it. Before I left, however, they took one or two pieces of calico for the women and children. I failed to get a message to the chief, Bowlegs, my messenger (Simon, a negro belonging to Bowlegs) having undoubtedly played false.

I sailed up and down the Caloosa Hatchee from the 9th to the 15th, landing frequently to look for trails, to make signal fires, &c.; but I saw no Indians there. The most recent camp I found was a week old.

Since my return here I have heard of the murders—on Indian river on July 12, and on Pea river on July 17th; and I allude to them only to remark that, on July 6th, I found the party of Marco Indians (Seminoles) encamped on the beach, near the mouth of Pea river, and friendly in their manner.

I hope the late outrages have been done by a small band of outlaws; and, at the worst, I hope the hostilities are confined to the Istokpoga Indians (Mikkasookies, Tallahasseees, and Creeks) under Sam Jones.

If my health will permit, I shall make another attempt to communicate with King Bowlegs and the Seminoles proper.

Most respectfully, your obedient servant,

JOHN C. CASEY,
Captain U. S. A.

General R. Jones,
Adjutant General U. S. A.

FORT BROOKE, FLORIDA,
August 20, 1849.

GENERAL: I have heretofore (July 23d) reported the result of my attempt to open communications with the Seminoles by visiting Caloosa river, &c. During that visit I left, at various points, packages which,
if seen by the chief, would be known to him as friendly invitations from me.

A few days ago my guide found at Sarasota, on an elevated point, an Indian peace-token, (a white flag made of feathers, with tobacco and white beads,) which he supposed to be in reply to those I had left. He left a sign that it would be answered at full moon, and at once brought the flag to me.

I shall attend at the time and place, and, if successful, hope to get authentic information of the feelings and designs of the Seminoles.

Most respectfully, your obedient servant,

JOHN C. CASEY,

General R. JONEs,.,

Adjutant General U. S. A.

WAR DEPARTMENT,
Washington, August 21, 1849.

Sir: As heretofore advised, the military force that is already assembled and to be concentrated in Florida is intended to defend the frontier settlements in the peninsula of that State. A change in the temper of the Indians, evinced by a general desire and purpose of renewing hostilities, may require an immediate modification of this instruction, so as to require a change in your movements. The end which the government has in view is the subjugation of the Indians, if necessary, and their removal to the west.

So far, a hostile purpose seems not to be general, but that the acts of violence and outrage committed on two occasions are confined to a few warriors who are represented as outlaws with their tribes. Under these circumstances, it would be cruel to involve the whole tribe in the guilt of a few, and punish accordingly.

Moreover, any act of apparent or actual injustice on the part of the government would tend to thwart the plan of their peaceable removal, which is an object of great solicitude to the President.

On the reasonable presumption that the whole tribe, or rather remnants of tribes, are unwilling for war, and that owing to the inefficiency of their government to control the conduct of their young chiefs, of, what is still more probable, the conceded inaptitude of the white and red men to live harmoniously in close neighborhood, it has been concluded, in the present aspect of things, that before any forcible means are resorted to for their removal, to try others which are gentler and more congenial to the feelings of those who are not hostile. The influence of their brethren who have emigrated west will be exerted over them. Accordingly, a delegation, accepted on their voluntary application, and composed of a few chiefs who, in former days, exercised an acknowledged control over the nation whilst united, may be expected to reach Florida about the first of October.

The outlines of the plan are to pay a specific sum—say $100—for the removal and transportation of each Florida Indian, or negro belonging to the Indian tribes, irrespective of age or sex, and their subsistence for a year after reaching their new homes in the west.
It is believed, from the information in the department, that this is, to some extent, practicable. At least it is commended by its justice and humanity—just to the friendly and humane to the hostile Indians.

In respect to the military operations, it is not perceived that the delay will result in any disadvantage, when we consider the season of the year and the peculiar character of the country in which the force under your command may be employed.

In the full confidence which the department reposes in your judgment and discretion, it is respectfully submitted whether, in the distressed condition to which the frontier settlers are represented to be reduced, you may not safely make the foregoing propositions on proper occasions and directly to the Indians. If you should conclude to do so, after full consideration of the subject, aided by consultation with others who know well the Indian character, the sub-Indian agent, Mr. Spencer, lam authorized to say, will co-operate with you. But it may be proper to remark, in this connexion, that no act should be performed which may, in any degree, impair the influence of the delegation from the west.

I am, very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

Brevet Major General Twiggs,
Tampa Bay, Florida.

HEADQUARTERS WESTERN DIVISION AND FLORIDA,
Tampa Bay, August 25, 1849.

Sir: I have the honor to report that I reached this place yesterday, and as soon as I have time will make the investigations and report called for by my instructions. From all I have heard since my arrival, I am disposed to coincide in the opinion expressed by Major Morris in his report.

I will call out no volunteers at present, and am afraid those now out, under the orders of the governor, may be of more injury than service.

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General, commanding.

Lieut. Colonel FREEMAN,
Assistant Adjutant General,
Headquarters Army, West Point, N. Y.

HEADQUARTERS WESTERN DIVISION AND FLORIDA,
Tampa Bay, Florida, August 27, 1849.

Sir: I have the honor to report that I have thus far been unable, with all my efforts, to “gain reliable intelligence on the subject of the recent murders and outrages committed by the Indians,” or to “ascertain their present disposition and temper.”

After the passage of the law of the State of Florida, restricting the Indians to the limits prescribed by treaty, they became dissatisfied, but it cannot as yet be certainly known whether the recent acts of violence were
national or perpetrated by a few outlaws. Since their commission there is no evidence of Indians having crossed the boundary, east or west. I cannot hear of any personal outrage done to any of the Indians.

Having seen the report of Major Morris, from all the information yet before me, I concur in the opinions expressed by that officer.

Some days previous to my arrival a white flag was found at Sarasota, as has already been reported to the department by Captain Casey. Yesterday I sent a company to the Manitu river. On reaching the district bordering on the river, from which the inhabitants fled, two white flags were found at Mr. Addison's, at the head of the river, and signs of the tracks of two ponies. Nothing had been injured on the premises, and nothing but some few pounds of flour taken from the house; indications from which something favorable may be hoped, in the expected meeting of Captain Casey and the chiefs.

The seventh infantry has not arrived, and some embarrassment in moving companies to the interior has arisen from want of transportation.

I have the honor to be, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General, U. S. A.

Lieut: Col. W. G. FREEMAN,
Assistant Adjutant General,
Headquarters Army, West Point, N. Y.

HEADQUARTERS WESTERN DIVISION AND FLORIDA,
Tampa Bay, Florida, September 1, 1849.

Sir: Since my last report nothing has been heard of the Indians, nor seen, except tracks of runners; nor can I ascertain that they have crossed the line since the outrages which drew the troops to this place. At all events, since that time they have not injured persons or property.

The panic is not less complete among the inhabitants; all industrial pursuits have ceased. The settlers, flying from their farms, are on this coast and East Florida, forted as far north as Fort King; and from a report of Colonel Smith, received on the 31st ultimo, there remains but one single person south of New Smyrna, on the eastern shore. There seems a general determination not to return until the Indians are removed. The opinion is as general that the outrages were perpetrated by the Indian nation; and I am disposed, after full and free conversations with agents, the citizens, and most intelligent traders, to coincide in this opinion. These people have purchased 120 rifles since the peace; have largely supplied themselves with clothes, ammunition, and everything necessary for carrying on hostilities. When in addition to these preparations it is considered that this outbreak occurred immediately after the annual national council or green corn dance, the impression of its nationality is strengthened. Be this as it may, so strong is the impression that such is the case, that the settlers will never venture to re-occupy until the Indians are removed or securely confined by troops to their lines.

Three hundred warriors may be stated as an approximation to their force. Should the general government decide on removal, the general-in-chief and the President, both acquainted with the country and the na-
ture of the warfare, can decide the question of force required, without an estimate, which I am unable to make.

The State troops under orders of the governor have not crossed the line, and say they will not without orders. The few companies of regulars have been sent to different points within a circle of some forty miles around this place for the protection of the inhabitants, but their movements have been delayed from want of any public transportation and the exorbitant prices asked for the country wagons and carts.

If Captain Casey, now at Sarasota seeking an interview with the chiefs, be unsuccessful, I will think it necessary to call upon the governor for a battalion of mounted men. The seventh infantry has not arrived, and the destruction of the horses (120) on board the Mary Kingsland, leaves me without the means of moving a company or mounting a man. The establishment of a line of posts demands a numerous medical staff, which I request may at once be ordered to report.

By the bursting of the boiler of the Mary Kingsland, off this port, seventeen men were killed and 120 horses and mules; all on board destroyed.

I have the honor to be, very respectfully, your obedient servant,

D. E. TWIGGS,

Brevet Major General, commanding.

Lieut. Colonel FREEMAN;

Assistant Adjutant General,

Headquarters Army, West Point, N. Y.

HEADQUARTERS WESTERN DIVISION AND FLORIDA,

Tampa Bay, Florida, September 3, 1849.

SIR: Since my letter of the 1st instant nothing has occurred requiring mention; the messenger despatched to communicate with Captain Casey has not returned.

From information obtained from the citizens, the rains, which in this county set in in August, continue until November; it has been raining every day since my arrival; the streams throughout the peninsula are rising; and, until they subside, it would be impossible to hunt the Indians.

If it is decided to make a forcible removal, I would suggest that boats, light and of little draught, be prepared in large numbers, and sent in charge of the navy to the coast; and that, manned with sailors, they should be ready at the proper time, in conjunction with the army, to penetrate the everglades by every inlet on the eastern, southern, and western coast.

The force now in the State, even when increased by the 7th infantry, (still expected,) will only suffice for protection for the frontier, and be entirely inadequate to the task of removal; horsemen, under any circumstances desirable, become in this event indispensable.

Since the instructions from the War Department of August 7, I have received no communication from the department or headquarters of the army with reference to the movements here.

I have the honor to be, sir, very respectfully, your obedient servant,

D. E. TWIGGS,

Brevet Major General, U. S. A.

Lieut. Col. W. G. FREEMAN, Assistant Adjutant General,

Headquarters of the Army, West Point, N. Y.
Major: I have the honor to report, for the information of the commanding general, the following notes of my recent interview with the Seminoles at Sarasota bay:

On the evening of the 3d, while anchored off the place where the white flag and token had been left by the Indians, we were hailed by three Indians on the shore, one of whom waved a white flag. I landed, and, as it was growing dark, arranged an interview with them for the next morning. They were very cordial in their reception, and expressed their gratification by their words and manner. The next morning (September 4) the interpreter and Felipe landed with me, and they said that they were sent to look for me by Billy Bowlegs, who had previously sent a white flag and token to that spot, for the purpose of opening communications. They said Billy had heard with regret of the late murders; and told them to say that, if I would meet him, he would be able to settle the difficulties to the entire satisfaction of the white people, and that Sam Jones had sent a runner to Billy with the first news, and urging him (Billy) to aid in preserving peace. The murder on Indian river, on the 12th of July, was committed by five young Indians, (Seminoles, who reside on the Kissimmee river,) one of whom is an outlaw, and who desired to make war for the purpose of saving himself from the Indian law. They remained on that side of the territory until the 15th; and, in less than two days, they crossed over to Pea river and committed the murders there. Assunwah was despatched, after the first murder, to arrest them, but reached Pea river only the day after the murder at the store. Immediately thereafter, the five murderers were overtaken and captured by Chitto Hajo, as they were on their way to the settlements.

The chiefs all disavow and regret these murders; and all the Indians are averse to hostilities. They are satisfied with their country, and with the treaty under which they are living; and they now earnestly desire to do justice in this matter. Finally, broken sticks were exchanged for a council with the chief at Charlotte Harbor, on the 18th instant.

Most respectfully, your obedient servant,

JOHN C. CASEY,
Captain, on Indian duty.

Major W. W. MAC KALL, Assistant Adjutant General,
Headquarters Western Division and Florida, Tampa Bay, Fla.

HEADQUARTERS WESTERN DIVISION AND FLORIDA,
Tampa Bay, Florida, September 6, 1849.

SIR: Since my report of the 3d instant, Captain Casey returned from Sarasota. From his report herewith, the general-in-chief will see that his efforts have been crowned with great success.

I will leave this in time to reach the place appointed for the council, at Charlotte Harbor, by the 18th. In my communications with the Indians, I shall confine myself to a simple demand that the murderers be delivered up, giving the Indians to understand that, this being done, their former peaceable relations with the whites are re-established.
On the subject of emigration I will be silent, this being another and a different question, not touched in my instructions. When removal is contemplated by the government, the agency of a delegation from Arkansas will, in my opinion, be indispensable, and the arrangements will be made with better chances of success by a civil agent than by the commander of the forces. I entreat that no steps may be taken while I am in command without my first being apprized, and no agent permitted to communicate with the Indians except through me and under my orders, as, in the present state of affairs, the slightest imprudence on the part of any agent of the government may produce disaster.

Everything is quiet, and my opinion before expressed, that the Indians had confined themselves to their territory, has been fully confirmed.

It is a simple act of justice to acknowledge the important service Captain Casey has rendered, in re-establishing, at no slight personal risk, a communication between these people and ourselves at a time when it was believed impossible by every man in this community, and thus probably averting a war otherwise inevitable.

I have the honor to be, very respectfully, your obedient servant,

D. E. TWIGGS,
Lieut. Col., Brevet Major General, commanding.
Assistant Adjt. Gen., Headquarters, West Point.

P. S.—Nothing heard of the 7th infantry, but, under the circumstances, I will make no call for volunteers.

TAMPA BAY, FLORIDA, September 9, 1849.

GENERAL: I have the honor to acknowledge the receipt of your letter of August 23.

With the sanction of Major General Twiggs, I now submit the following report of operations since my last report of August 20. It was then mentioned that a white flag and token had been found at the south end of Sarasota bay, near the rancho of one Felipe Bermudez, (my pilot and interpreter during my visit to Charlotte Harbor and Caloosa river in July last.)

On August 31, I anchored in a small sloop off the deserted rancho where the flag had been found, and on the evening of September 3, three Indians hailed the vessel, holding up a white flag; the interpreter declining to accompany me, I landed alone, with their flag in my hand, walked up to them, and asked if they were friends. They received me with every demonstration of joy; said they had been sent to look if we had got their flag and token; that their head chief, Holaha-mikko-chee, (William Bowlegs,) told them that if they saw me, to say all should be made straight, and he desired that I would meet him and the other chiefs in council; and now, seeing that I had the flag, and had met them, they were overjoyed to see me. I told them that the late murders and their subsequent silence had so much the appearance of hostility, that my interpreter (Sampson) dare not come aboard with me, and that, if he would not land next morning, they must go aboard with me to talk. After a little hesitation, the spokesman said he would go on board, but the other
two must remain on shore; and then we parted, to meet at sunrise next morning.

On the 4th, the interpreter and Felipe both landed with me, and I proceeded to note the substance of their talk. They stated that the late murders were committed by five young men, without the sanction or knowledge of any chief, and in opposition to the feelings of every Indian except the criminals themselves; that, as soon as the news of the assault on Indian river was received, Assunwah was sent to arrest the murderers, and Sam Jones (Apai-akkee) sent word to Bowlegs, and urged active measures to preserve the peace; that the marauders crossed over to the store on Pea river in a day and a half, and the pursuing party under Assunwah only reached there the day after, to find the people murdered, and the store burnt. The criminals, unable to get any others to join them, were then making for the settlements, to fire the houses and murder the settlers, but were overtaken and arrested by a party under Chitto-Hajo, who has them in custody. Two of them, including the leader, are sons of Chitto-Tustennukkee, with whom General Macomb made the treaty of May, 1839, at Fort King.

They told me, without hesitation, who the murderers were. One of those (named Yahola-Hajo, youngest son of Chitto-Tustennukkee) was recognised by McCullough and wife, who escaped at the time of the murder of Payne, on Pea river.

In reply to my inquiry, why they had been so tardy in sending word to us, they said, that if I had remained one day more on the Caloosa river last July, I should have met the chiefs. The negro (Simon) carried my message correctly on that occasion, (although I supposed, and reported otherwise in my report of July 23,) and Bowlegs was on his way to meet me, when the runners from Sam Jones, with the bad news from Indian river, turned him back to his town, to send orders to his men, who were out hunting, to come home at once. This must have been about the 14th or 15th of July. That Bowlegs, fearing I might tire of waiting, then sent a runner to tell me to wait for him, as he had important business; and that he met this runner returning from the river with the flag and token left by me at Rocky Point, and intelligence that I had gone, but that a fresh fire had been kindled on the right bank, near the mouth of the river—he supposed by me. From this, I presume the runner reached the rendezvous the day after I left, (July 19.) About that time, another runner brought them the news of the murderers and burning of the store, which they would not believe until the return of a runner sent by Bowlegs to verify it. The chief Bowlegs then sent four runners, with orders to carry a white flag and token to Felipe, at Sarasota, and ask him to take it to me. To their dismay, they found the whole neighborhood deserted; so they attached the flag to a pole, in a conspicuous place, (as they saw, from signs, that the rancho and garden were occasionally visited,) and then returned to report. They (the present three runners) were sent to ascertain whether their flag had been found and answered, and that, when I came to them with the flag, they knew all would be settled peaceably. They then asked me to appoint a time and place to meet the chiefs in council. I told them of the trouble caused on our frontier, of our preparations for war, and of the general belief in their hostility; that General Twiggs had arrived to settle the matter, and that he ordered me to say that he came to settle this question only; and that they must
surrender the murderers, as well as disavow their acts, when peace would be again restored as before; and, finally, that the General had not come to discuss migration, or anything else.

I also told them that their chief must meet the General, to adjust the difficulties, and that the General must have troops with him. Here they appeared alarmed. I told them that the General pledged his word for their safety, under the white flag, and that in no event would he "grab" them; and I pledged my own word to the same effect. They said they were not chiefs, and could not speak beyond their instructions, which authorized them to appoint a council with me only; but that, if I would go with the General, and land in a small boat; I could explain this necessity to the chiefs, and they might trust themselves in our power. I, of course, promised to attend, and also told them to tell the chiefs that the prisoners must be surrendered, that the council must meet the General, and that hostages should be landed for the security of the chief, if desired. The 18th of this month was fixed upon for the grand council, at Charlotte Harbor.

After concluding this business, I asked if one of them would accompany me as an evidence (to others) of their sincerity, and Fuss Enenhah, a connexion of Bowlegs, said he would go with me anywhere, and he accordingly came here with me.

I have given all these details, at the risk of being prolix, for the purpose of showing the department how wild and suspicious they are, and to account for the long interval which elapsed between the murders and our communications.

I have the honor to be, most respectfully, your obedient servant,

John C. Casey,
Captain, on Indian duty.

Major General R. Jones,
Adjutant General, U. S. Army.

Headquarters Western Division and Florida,
Tampa Bay, Florida, September 10, 1849.

Sir: Since my report of the 6th instant, all has been quiet; no Indians have been seen, and it is most probable nothing will be heard from them until the 18th, the time appointed for our meeting at Charlotte Harbor.

On due consideration and consultation with Captain Casey, I am fully impressed with the impolicy of agitating the question of removal in the approaching interview. We both agree that it is better to wait the arrival of the delegation, and let the western chiefs go into the nation and make the suggestions when they find a propitious moment.

Neither troops (7th infantry) nor transportation have arrived.

I have the honor to be, sir, very respectfully, your obedient servant,

D. E. Twiggs,
Brevet Major General, commanding.

Lieut. Col. Freeman,
Assistant Adjutant General, Headquarters of the Army.
HEADQUARTERS WESTERN DIVISION,
Tampa Bay, Florida, September 23, 1849.

SIR: I have the honor to report that, on the 16th instant, according to arrangements made by Captain Casey, I left this for Charlotte Harbor, to meet the Indian chiefs.

We found a party of thirty Indians on the shore waiting our arrival. On being approached by Captain Casey, they informed him that the chief Bowlegs was expected every moment. On the 18th, the time appointed for the interview, Bowlegs came on board my vessel, with a party of four or five warriors, repeated the statements made some time previous by his runner, that the outrages were perpetrated by a few outlaws, who would be given up to justice; that the nation had nothing to complain of on the part of the whites—were desirous of peace, and determined not to allow peaceable relations to be disturbed by the acts of individuals. The next day Bowlegs returned, bringing with him the principal sub-chief of Sam Jones. The two then made the same professions and the same promises, that, by the 19th proximo, the murderers should be arrested and put into our hands. I confined myself to a demand for the murderers, studiously avoiding any allusion to the coming of the delegation, or the question of removal. At this moment I believe the Indians desirous of peace, and determined to avoid war by the fulfilment of their promises. On the 19th proximo I will return to Charlotte Harbor, or send Captain Casey to receive the chiefs.

Mr. Spencer, Indian agent, has arrived. I have had no conversation with him on business.

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General, U. S. Army.

Lieut. Col. W. G. FREEMAN,
Asst. Adjt. General, Headquarters of the Army, West Point.

TAMPA BAY, FLORIDA,
September 23, 1849.

GENERAL: In my report of September 9th, it was stated that a council with the Indian chiefs was appointed for September 18th, at Charlotte Harbor.

I now have to inform you that I accompanied Major General Twiggs to that place, and at the appointed time met King Bowlegs, with thirty-seven of his sub-chiefs and warriors. He stated that the principal chief of the Mikasookies (Kapiktsootsee) was close by, and would attend that day or next day, but that he (Bowlegs) had authority to act for the nation—both people.

He agreed at once to surrender the five murderers, who were, he said, watched (not tied) at their town on the Kissimimee, and that as soon as Kapiktsootsee should arrive, they would give me the “broken days,” or sticks. He then accompanied me on board the steamboat to see the General, when he renewed his pledges.

The next day (19th) the Mikasookoo arrived, and strongly pledged his people to the same action that Bowlegs had promised, and then both accompanied me on board the steamer.
During the talk on shore, I told them that I was satisfied with their action in all points, except the number of broken days, and that they must discuss that matter more with the General.

In explanation of the time required, (forty-five days,) they said that the country was inundated, which would retard travelling, and that they had few or no ponies left; and, above all, that the five murderers had to be seized by stratagem and surprise, for they were desperate and armed. They named a distant day, that they might speak with certainty.

After talking with General Twiggs, they agreed to reduce the days to thirty, (or until October 19th.)

I can only add, that they appeared to be sincere, and that they trusted their chief on board the armed steamer, on my pledge, and without hostages, which I offered.

It may not be unimportant to state that, before the councils, I supposed (and so stated to Major Mackall, assistant adjutant general) that they probably could not deliver the prisoners before the 20th to 25th October.

With great respect, you obedient servant,

JOHN C. CASEY,
Captain, on Indian duty.

Major General R. Jones,
Adjutant General U. S. A., War Department.

HEADQUARTERS WESTERN DIVISION,
Tampa Bay, Florida, September 29, 1849.

Sir: I have the honor to acknowledge the receipt of your letters of September 12th and 13th, with General Order No. 45. In my letter of the 1st of September, to Lieutenant Colonel Freeman, I stated, "if Captain Casey, now at Sarasota, seeking an interview with the chiefs, be unsuccessful, I will think it necessary to call on the governor for a battalion of mounted men, &c." From my reports of a later date, it will be seen that Captain Casey was entirely successful, and the emergency did not arise. No call has or will be made. No additional troops will be required here for the purposes of protection. Should an attack on the Indians be ordered, the department will, I trust, send troops sufficient to make the blow effective.

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General, U. S. A.

Major General Jones,
Adjutant General, Washington City, D. C.

HEADQUARTERS WESTERN DIVISION,
Tampa Bay, Florida, October 3, 1849.

Sir: In my letter to the Adjutant General of September 29, I stated that the force now in this State was sufficient for the protection of the inhabitants. This statement was made on the supposition that the present relations (believed to be peaceable on the part of the Indians) should not
be disturbed by any act of ours. Under present circumstances, confidence, more than protection, is required; and this, to a reasonable extent, the force here, judiciously used, should give.

Should the peaceable intentions of the Indians be changed, by any action on the part of the government, (and I believe any attempt at hasty removal will so change them,) to a determination to resist to the end, a large force will be instantly demanded for protection—a larger one to effect removal.

Preparatory to a movement into the Indian country, I would make every effort to secure the frontier settlements against an eruption of the savages. To do this, I should propose a line of posts from the Manatee to the Indian river, passing between Kissimme on the south, and Cypress lake on the north. On this line of 200 miles, posts of two companies each, 10 miles apart, would be required, making 40 companies. Also depots, at Miami, New and Indian river, St. John's, on the east, Manatee, Charlotte Harbor, and Caloosahatchee, on the western side of the peninsula, with aggregate garrisons of 13 companies, and a mounted force of 300, to be drawn from the footmen, to act as escorts; gather information, and to protect isolated settlements in rear of the line from marauding parties, should such pass through.

With the line thus guarded, the settlements might be protected and the Indians confined to the southern portion of the peninsula. With depots thus established, I should be prepared to penetrate this still large district, 200 miles in length and of an average width of 130. The Indians probably would at first be embodied and give battle, on advantageous ground, with their whole force, stated in my letter of September 1st at 300. No party of less than 500 should then be thrust into their strongholds—it is not enough to beat them from their ground: To crush, or after a battle to be strong enough to guard your wounded and still pursue, can alone produce good results. Two such bodies, making two regiments, is the smallest number with which, in so large a country, I might hope to find, pursue, and harass the enemy. After the first brush, if defeated, the Indians would break into smaller parties, and seek safety in concealment. The number of the pursuing parties would then be increased, their strength diminished. The garrisons on the line may now be diminished to increase the active force. In addition, the everglades and lakes must be penetrated and swept by parties in boats, say fifty boats, capable of holding ten men each. This force should be composed of sailors: The boats of light draught can, I understand, be made of copper in the eastern cities, lighter and more durable than wood, which decays so soon in the southern waters. No large vessels will be wanted with this force, as it can be supplied from the army depots. Navy-vessels attached and coasting along shore, as in the last Florida war, are expensive and unserviceable.

The above notes are made on the supposition that hostilities may result from an attempt to force these people into emigration, and not in the belief that the war is to be expected from any unwillingness on the part of the Indians to comply with the promised atonement for the late murders. The smallest force which promises any chance of success has been named. A larger force would, I believe, be more economical, and sooner accomplish the end; a smaller would be a useless expenditure of life and money.

Let not this estimate be thought too large. We must forget that only three hundred Indians are to be beaten, and only remember that three
hundred men, inured to the climate, individually acquainted with every foot of ground, familiar with every place of concealment, are to be found, seized, and transported.

In war, to beat and break an enemy is to conquer a country; an enemy who constantly flies at your approach yields all the fruits of victory—the strongholds, munitions, resources, and sovereignty of the country. It cannot be too often repeated that hunting Indians for transportation is another problem. Here, if the enemy runs and escapes, you are defeated; your strength, your stores, are exhausted. He is uninjured; his munitions are on his back, his food in every stream, in every bush, his bread on every acre he passes by; he flies, and leaves no trace behind; his person, the object of your pursuit, driven from one fastness, finds shelter in a still more impenetrable swamp in your front or rear, to the right or left; he sees your camp fire, and hears the sound of your receding forces as they pass in fancied pursuit. Your numbers, then, must make up for his intelligence and fleetness. Every hammock and swamp must be frequently swept, that he may find rest in none; life must become a burden, and for rest he must seek another land.

Recapitulation of estimated force.

73 companies, 50 men per company 3,650
Sailors and marines for boats 500

4,150

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General, U. S. A.

Lieut. Col. W. G. FREEMAN, Asst. Adjt. General,
Headquarters of the Army, West Point, N. Y.

WAR DEPARTMENT,
Washington City, September 17, 1849.

Gentlemen: In view of the concurrent action of yourselves, as officers of the Departments of War and of the Interior, the heads of these departments deem it proper to address a joint communication to you in relation to Indian affairs in Florida, expecting and directing you to cooperate in carrying out the views of the administration.

In every aspect of the condition of the Indian, so long as he remains in Florida, his speedy removal to the west appears desirable and necessary. The administration, being thus impressed, have concluded that their removal, voluntary or forcible, is to be effected. And this purpose, apart from other considerations, should be regarded as more binding on the government, because of an obligation arising under a treaty, the execution of which does not admit of further postponement.

The most obvious policy demands the employment of peaceable measures, where there is a reasonable probability that they will effect the desired end. Such a course harmonizes with the humane line of policy heretofore pursued towards that unfortunate and perishing race, and is
congenial with the sense of justice which their pupilage to the government actually awakens. Accordingly, after reminding them, on all occasions of friendly conference which may be allowed by them, of the feebleness of their merely nominal strength as compared with the overwhelming force which will be brought to act against them; of their insecure and unhappy condition in a dense neighborhood of the whites, who every day advance upon them and restrict them to narrower limits; of the interminable strifes which that neighborhood (as all past experience has proven) will certainly and fatally entail upon them, and from which there can be no escape unless by a removal from such destructive influences as degrade their morals, and would ultimately destroy their race—strengthening these suggestions by reminding them of the peace, and comfort, and security, which a reunion with their brethern of the west, from whom they have been so long separated, would ensue, you will propose, in behalf of the government, to pay to each Indian in Florida, (without regard to sex or age,) and to every negro or mixed blood attached to the nation, one hundred dollars, and to furnish transportation to the country of their tribe west of the Mississippi, and subsistence for twelve months after reaching their new homes. The essence of this proposition is in its application to their voluntarily emigrating. To any number that may accept it, be they few or many, you can give the assurance that all its terms will be observed with fidelity on the part of the government.

You have been heretofore informed that, as auxiliary to this scheme, the government has accepted the services of a delegation of their tribe from the west, who are to visit their brethren in Florida and exert their influence on the latter to procure their peaceable removal. The plan appeared feasible, and was consistent with the long-entertained and ultimate purposes of the administration. It is desired and expected that a fair trial may be made of their agency. Nothing will be lost by any seeming delay arising from this effort, when it is considered that the country and climate would not admit of earlier and more decisive action, if compulsory measures must at last be resorted to.

The delegation from the west must be suitably provided for, and treated with kindness. To them you are authorized to propose the same inducements as above stated, for each Indian, mixed blood or negro, who may, through their influence, be brought in and emigrated to the west. In each case no greater equivalent will be allowed to the emigrant or the delegation, or to both, than if the former had consented to emigrate peaceably: that is to say, that in whatever manner the emigrating may be brought about, the government is only to pay the one hundred dollars, transportation and subsistence, as hereinbefore proposed.

If, notwithstanding the desire and the exertions of the government to effect a peaceable removal, it should become necessary to resort to force to effect the object, you are authorized to employ the delegation, or any part of them, in the service of the United States, with the promise of such compensation as you may deem reasonable. In your first interview with this delegation, you will give the assurance that compensation will be allowed them for their services, dependant, in some degree, upon the value of these services in conducing to the speedy and voluntary emigration of their Florida brethren to the west.

When convinced that the means suggested or applied will be or are
unavailable, you will report the matter immediately to our respective depart­ments. In the mean time, orders will be issued to the army to meet such contingencies as may arise.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

T. EWING,
Secretary of the Interior.

Brig. Gen. D. E. TWIGG, U. S. Army, and
SAMUEL SPENCER, Esq., Indian Sub-agent, Tampa Bay, Florida.

WASHINGTON, September 20, 1849.

GENTLEMEN: In addition to our instructions of the 17th instant, and after due consideration of the importance of the peaceable removal of the Indians from the State of Florida, especially as they have recently evinced a friendly temper in respect to the perpetrators of the outrages which were committed in July last, you are directed, if in your judgment deemed necessary, to increase the pecuniary inducements to a reasonable amount which will effect the purpose contemplated by the government—the voluntary removal of the Indians to the west. Confiding this negotiation to your judgments, after a full view of all the embarrassments with which it may be surrounded, we will cherish the hope that your efforts will not be unsuccessful.

We are, gentlemen, your very obedient servants,

GEO. W. CRAWFORD,
Secretary of War.

T. EWING,
Secretary of the Interior.

Brevet Major General D. E. Twiggs, and
SAMUEL SPENCER, Esq.,
Indian Sub-Agent, Tampa Bay, Florida.

WAR DEPARTMENT,
Washington, September 21, 1849.

SIR: I have perused with great care and pleasure yours of the 6th instant, accompanied by a copy of the report of Captain John C. Casey, detailing the interview he had at Sarasota with certain Seminoles, who represented themselves as the agents of Bowlegs, the Indian chief.

The result of the meeting assigned to take place on the 18th instant is looked to with some anxiety, as at it the purposes of the Indians will be, in some measure, disclosed—either the surrender of the perpetrators of the July outrages or a refusal to deliver them up. The Indians, at the same time, may indicate their intention concerning their removal to the west. I notice with approval your purpose only to demand the offenders at this meeting, yet I hope that you did not permit any occasion, rendered favorable by the temper of the Indians, to escape, so as to ascertain their views in respect to their removal.

As explaining the ends contemplated by the government and the means
applicable thereto, I beg to refer you to the joint communications from this department and that of the Interior under their respective dates of the 17th and 20th instant. Their tenor is very apparent, and the result to be accomplished is the removal of the Indians from the State of Florida; and the first expedient, is their peaceable removal; the last, is their coercion.

To Captain Casey you will please to communicate that the government properly appreciates his meritorious conduct in opening conferences with the Indians, whereby they are permitted to select between a peaceable or forcible removal from Florida; or, what may be more disagreeable, their partial or entire extermination.

I have the honor to be, very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Brevet Major General D. E. Twiggs,
Tampa Bay, Florida.

War Department,
Washington, September 24, 1849.

Sir: To the end of placing the affairs of the Indians entirely under your control, as the commanding officer of the army in Florida, so as to secure the greatest efficiency in the prosecution of the measures of the government, the President has directed that the duties of the sub Indian agent, Mr. Spencer, be suspended for the present. This decision will not impair, in any degree, the joint instructions heretofore given from the departments of the Interior and War.

It has been deemed proper to make more explicit the previous directions in respect to the protection not only of the settlements of the whites, but the reserve of the Indians. Accordingly, it is suggested that you take prompt steps so to establish and extend your posts as to prevent all intercourse between the whites and Indians.

On the 20th instant you were authorized to increase the amount which is to be offered to the Indians as an inducement for their peaceable emigration to the west. Since then I have seen an estimate, amounting to $215,000, which, if proffered to the Indians, would probably save the necessity of their forcible removal. Whilst this sum is regarded as high, still, if more advantageous terms cannot be agreed upon, you are authorized to conclude the contract accordingly.

I am, very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Brevet Major Gen. D. E. Twiggs,
Tampa Bay, Florida.

Headquarters Western Division,
Tampa Bay, Florida, October 6, 1849.

Sir: I have the honor to acknowledge the receipt of the letters of the 17th and 20th ultimo, signed by the honorable Secretaries of War and the Home Departments, and yours of the 21st and 24th ultimo. By
these I am directed to take measures for the removal of the Indians from this State.

To do this to the satisfaction of the government I will devote all my attention, and am not without the hope of success.

In my instructions I am not restricted as to time. This I hope was no accidental omission. In this affair time is a more important element than money. I may not be able to persuade this people to remove in months; with the whole regular force of the United States I might fail to coerce them in years. Months of persuasion cost neither money nor life. Every man I can induce to go, renders the task of forcible removal more easy. Every settler's store I can establish in their country for trading in peace, opens a door for entrance in war.

The minds of these people must be prepared for the consideration of the question. They are devoted to the soil on which they live, for which they have fought, and, harder still for savage nature, are now making the sacrifice of some of their numbers. The delegation must have full time to work, and make this love of country yield to the love of their relations in the west. The advantages to be gained these must, in time, be weighed with the troubles constantly to be expected here.

To approach them now with an offer of a million of money and all the prairies of the west, and war the alternative, there would not be a moment's hesitation in deciding for war to the knife.

Nor, on a full review of the past, will humanity sanction, or policy permit, a course which may bring war in its train.

In 1842, General Worth made a convention with these people. For seven years its terms were kept by every individual in the nation. The nation has not yet violated one stipulation. In seven years, unexampled in our history, not a murder was committed on an Indian frontier of some 300 miles.

In July, 1849, three murders were committed; the dead disclaimed by the nation, and the offenders offered to our justice. Will this justice now press hardly on a nation so acting? No one sympathizes more than myself with the people of Florida, nor feels more deeply for their sufferings; but their circumstances are not peculiar for a border people, unless in having better fortune than their fellow-citizens in other States.

In seven years three of their number have been sacrificed. In Texas, at Corpus Christi alone, thirty-nine have been killed, maimed, or carried away by the Indians within the past six months. That justice may be done to the Indians, these facts should be allowed to speak for themselves. That mercy may be shown to the women and children of Florida, we should resort to protracted negotiation rather than protracted war. Proclaim war, and in a week 10,000 men would not secure the planter and his family from Cape Sable to Georgia.

To remove these people with the least delay, we must take time enough to avert a war, whether weeks, or months, or years be required.

In saying I enter on this work with hopes of success, I mean, in what to me seems a reasonable time; not less than a year—probably more. If I have misconceived the intentions of the department, and, after the delegation has been briefly tried, I am expected to submit to the Indians the alternative of instant emigration or war, let me be so informed, and I will comply with the order in such manner as I find most likely to be attended with success.
At the same time, so surely do I foresee the choice they will make, that, for the safety of the inhabitants, I must have an adequate force in position before the alternative is presented.

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,

Brevet Major General, U. S. A.

Hon. Geo. W. CRAWFORD,

Secretary of War, Washington, D. C.

WAR DEPARTMENT,

Washington; October 22, 1849.

Sir: I have received yours of the 6th instant, and, of course, my attention was directed to that part which adverted to the time within which you may be presumed to execute the duties of your present command. Having frequently stated, in my communications to you, the object of the government is the removal of the Indians from Florida, and that all the means of peaceful removal should be first exhausted before the opposite course should be resorted to; I had supposed that no misapprehension could arise on this subject. To remove all doubt, I now say, that it is expected, and you are accordingly instructed, to remove the Indians to the west by the employment of means already designated and placed under your control, and that you will not commence any plans of force until further directed by this department, unless the Indians should, in the mean time, become hostile; and then you will take immediate steps to restrain and punish them.

I am directed by the President to say that he considers the force in Florida sufficient for present purposes; and that their judicious distribution, which you have doubtless made, in close proximity to the Indian border, will prevent any general intercourse between the whites and Indians, and thereby postpone or prevent the leading object of the President—the voluntary emigration of the latter.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,

Brevet Major General D. E. Twiggs,

Secretary of War.

Tampa Bay, Florida.

HEADQUARTERS WESTERN DIVISION,

Tampa Bay, Florida, October 19, 1849.

Sir: On the 17th instant I reached Charlotte Harbor to keep the appointment made with the Indians for the 19th. I found them already assembled at the point selected. The chief Bowlegs immediately came on board, and informed me that he, with Sam Jones and some sixty warriors, had been waiting for nine days; that three of the murderers were in confinement, one had been killed in an attempt to escape, and the fifth had effected his escape.

On the 18th Bowlegs came on board, bringing the three prisoners, and a hand as a proof of the death of the fourth. Sam Jones declined coming
on board, but had an interview with Captain Casey ashore. Bowlegs
was accompanied by twenty of his people, several sub-chiefs, and many
lads and young warriors. He delivered the prisoners; said he had made
severe laws to prevent the whites from being molested, and had now
brought his young men that they might see how sternly he executed
them.

This affair was now completed to our satisfaction. The Indians had
redeemed their promises; and, I believe for the first time in their history,
yielded one of their number, by a solemn act of the nation, to the justice
of the whites. Having expressed my high sense of the worthy manner
in which they had acted, I proceeded to submit to them the question of
emigration, and to urge it by every argument at my command. I told
them, that though they had made all the amends in their power for the
outrage upon the whites, these were excited and fearful of trusting their
families or themselves in their neighborhood; this very distrust would
produce new troubles. Here, there was no peace for them; the terms of
the government were liberal, and beyond the Mississippi hunting grounds
wanted them, and there the far larger portion of their people were anxious
to receive them.

This proposition, at such a moment, was unexpected; the only answer
they made was an appeal to their last act as evidence of their claims to
our consideration. I urged upon them the importance of the decision
they were now called upon to make; the necessity of giving it, however
unexpected or disagreeable; a calm review; to think on it, and talk over
it, and listen to the pleadings of a delegation from their brothers in the
west, not brought by us, but by their anxiety to make all partakers of the
comforts enjoyed by themselves, and who were daily expected.

These people are slow to move. To them this is a great question; to
the chiefs, a question involving both life and influence.

I avoided a decision at the moment, knowing it must be refused, and
urged them to meet me again in council, to which they assented, and
time and place were appointed.

Nothing in their speeches enabled me to form an opinion of what that
decision will be; and, from the manner of Indians but little can be
drawn.

The murderers I will keep, as a means the more of working on their
feelings, and securing my communications with the nation, from which I
still hope the best results.

Since writing the above, your letter of the 5th inst. has been received.
The delegation has not arrived, nor could they have assisted by their
presence. The chief Bowlegs impressed upon us the danger they would
run by entering the nation at this time, and, stating he was a warm friend
of Coacoochee, begged he might not come into the nation until he re-
ceived assurance that he could do so with safety.

In conclusion, I have to state my belief that the people will remain
quiet until after the next council. In the mean time, I think, many of
those disposed to go may seek the protection of the troops, and that this
weakening of their numbers may produce a panic which will induce the
whole to emigrate.

I am, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General U. S. A.

Hon. Geo. W. Crawford, Secretary of War, Washington, D. C.
WAR DEPARTMENT,
Washington, October 30, 1849.

Sir: I have received yours of the 19th instant, whose intelligence had been communicated by telegraph from Savannah a few days in advance of its arrival.

Concerning the three Indian prisoners now in your custody, you will notify the executive of Florida of your instructions and readiness to deliver them up for trial for the murders and outrages committed in July last in the counties of St. Lucie and Hillsborough, and will accordingly surrender them to such persons as his Excellency may appoint to receive them. Should it so happen that the authorities of Florida may not receive these prisoners for trial before their courts, then they will be kept in close confinement until a convenient mode of sending them to their tribe west of the Mississippi river shall occur.

Should, in the course of your negotiations for the removal of the Seminoles westward, any portion of them fly to the military posts for security, protection will be given to them, and at the same time you will not permit them to rejoin their nation. On the contrary, they will be cut off from all communication with their tribe, and sent to the west. In seeking your camp and protection, the Indians will be presumed to have fled from the indignation and punishment of their brethren, in consequence of a wish voluntarily to emigrate, and of course you will see that the refugees in going forward to the west are adequately provided for.

In the prospect of embarrassments arising from the tardy deliberations of the Indians in respect to their emigration, it has occurred to the department that if the intercourse between the Indians and whites, and particularly the class called Indian traders, were cut off entirely, that at least one obstacle would be removed.

Whenever the delegation of the Seminoles shall arrive from the west, you will admonish them of the danger of entering the nation without having obtained a guaranty of their safety, such as was suggested by the chief, Bowlegs.

You can say, in your next interview with the chiefs, that the President is highly gratified with their late act in surrendering the murderers—less for the sake of punishing those who violate laws than in preventing a repetition of offences. He also sees in the act a strict compliance with the requirements of their duty, standing as they do under the protection of the government, and as the best means of enforcing their own laws. Under such circumstances, the Indians will always find in the President a firm and good friend. At a period of peace and friendship, he accordingly advises the Indians to voluntarily place themselves beyond the reach of difficulties and dangers, where their contact with the whites will not expose their authority to abuse, and their nation, as in the recent instance, to the painful necessity of capturing or even killing their people for the object of delivery up for trial by the laws of the whites.

I have the honor to be, very respectfully, your obedient servant,
GEO. W. CRAWFORD,
Secretary of War.

Brevet Major General D. E. Twiggs,
Tampa Bay, Florida.
FORT BROOKE, Florida, November 7, 1849.

Sir: Yours of the 22d October I found here on my arrival to-day. I respectfully state that I have not misapprehended the wishes of the department or the President; all my efforts have been, and shall be, solely with a view to the peaceable removal of the Indians, unless they may choose to construe my posting the troops on their frontier as an act of hostility.

I will be very careful in all my movements to give them no just cause of offence; but from their present temper, I fear they will not listen to reason, and I should not be taken much by surprise if they commenced hostilities as soon as they can get their families in some secure place.

I have the honor to be, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General U. S. Army.

Hon. Geo. W. CRAWFORD,
Secretary of War, Washington, D. C.

HEADQUARTERS WESTERN DIVISION,
Tampa Bay, Florida, November 10, 1849.

Sir: I have the honor to acknowledge the receipt of your letter of the 30th ultimo.

The Indian prisoners were surrendered to me unconditionally, and even with the belief that they would be immediately executed; but thinking it might have some influence with a portion at least of their tribe, I promised if they would consent to emigrate, I would allow them to take the prisoners with them. I have sent the prisoners to the military post on Pease creek, hoping that their families may come in; and another consideration, should a movement of troops be found necessary in their present limits, they would be invaluable as guides, as they promise to show all the hiding-places of the families.

The district judge of the State was here when the prisoners were brought to this place, and he thought it would be better to let them remain with the military to act as guides, or to be used as an inducement for the emigration of their tribes. Moreover, the fall courts are now over.

The above reasons are respectfully presented for your consideration, before the prisoners are offered to the governor of Florida.

Since writing the above, the propeller Ashland has arrived from New Orleans with the delegation from Arkansas, consisting of ten Indians and two interpreters, with Halleck Tustenuggs at their head; all in charge of Mr. Duval, Indian agent.

I have the honor to be, sir, very respectfully, your obedient servant,

D. E. TWIGGS,
Brevet Major General U. S. A.

Hon. Geo. W. CRAWFORD,
Secretary of War, Washington, D. C.
War Department,  
Washington, November 28, 1849.

Sir: I have received yours of the 7th and 10th instant.  
Your views are concurred in concerning the Indian captives, and the use to which you propose to apply them in the event of hostilities, which you seem to apprehend.

With the assurances which you have given to the Indians, that their personal rights will be respected and protected whilst in friendly intercourse, you will, on all occasions, endeavor to convince them that the extension of your posts nearer their borders is for the double protection of them and the settlements of the citizens of Florida. Whatever may be their conclusion, such, at least, is the purpose of this department.

You will take no hostile step against the Indians unless hereafter instructed, or the Indians become hostile, and then you will act according to previous instructions.

I desire to learn what progress the delegation from the west may make in influencing their brethren in Florida to rejoin their tribe beyond the Mississippi. Has the former been received by the latter?

I am, very respectfully, your obedient servant,

GEORGE W. CRAWFORD,  
Secretary of War.

Brevet Major General D. E. Twiggs,  
Tampa Bay, Florida.
Str: In Assigning you to the command of the eighth department, the President is fully aware of the important and delicate duties which will devolve on you. To defend and protect the extensive frontier from the Red river to the Rio Grande will claim your first care. As a general guide, I earnestly commend to your consideration the plan of defence as organized by the President whilst in the command of the western division of the army. It is, however, submitted to your judgment to make such changes in it as circumstances may require and your observation approve.

With neighboring Indian tribes, so wandering in their habits, and capable of ready and rapid concentration at a designated point, it is scarcely possible that this department can, at all times, be fully apprized of the necessity of an additional force to be placed under your command. I am, therefore, directed by the President to say, that in the event you should find your force inadequate to the service which you are required to perform, you will then make a requisition upon the executive of the State of Texas for a limited force of mounted men, which is to be placed under your direction for a limited period—not exceeding six months—and disbanded at the pleasure of the President.

As the raising of this additional force is in a great measure placed in your discretion, and the tendency of a large portion of the American people is to seek military employment, it is submitted whether this part of your instructions may not be considered as confidential, lest, indeed, the necessity which is now sought to be avoided may not be intentionally produced.

It has occurred to me to refer to the force now under your command—of, say 28 companies—whereof one thousand are infantry, one hundred of artillery, and three hundred of dragoons, making the aggregate 1,400 men. This force, as compared with that which was organized for the defence of Texas whilst it was a republic, was considered amply sufficient at the time of distributing the army in the several departments, in August last. In addition to this consideration, it is believed that the population of Texas has been greatly increased, and consequently her capacity of self-defence has been increased in an equal proportion.

A friendly intercourse with the Indians, it is thought, will promote a state of kindly feeling and attachment on their part, which it has ever been the policy of the United States to cherish with all savage tribes. The red man is usually alive to a sense of justice, as he is quick in the resentment of injury. To the extent of your authority you will redress his wrongs, and thereby furnish the practical proof that your acts are in keeping with your intent of doing justice. At the same time the Indians must be taught to know and respect our rights. To punish them, is not
desired; but if they are to be taught by punishment alone, let them have their first lesson with such repetitions as may be efficacious.

You will omit no opportunity to make earnest efforts to reclaim and restore all captives who have been taken and carried away by the Indians. This duty has been assumed in behalf of the Mexican people by a treaty with Mexico, which is considered as superadding only a specified obligation to the general claim which humanity imposes on all civilized nations.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

General George M. Brooke, U. S. Army,
San Antonio de Bexar, Texas.

HEADQUARTERS EIGHTH DEPARTMENT,
San Antonio, July 14, 1849.

GENERAL: I have the honor to enclose a map of the State of Texas, with a line of posts, as at present established on the frontier. The location of some of them may be changed in some slight degree, but it is believed that this line is the true one. I shall, however, in a very short time, instruct Lieut. Whiting, of the engineers, to make a reconnaissance of the line, commencing at Eagle Pass, on the Rio Grande, and terminating on the Red river. His instructions will embrace the general character of the country, the roads to be constructed between the posts, timber for quarters, fuel and water, forage and subsistence, which the country adjoining the posts can supply; noticing the amount of cultivation and population. He will also report on the military sites now established, with the necessary works applicable to each position; the number of companies in each work, which must be proportioned to the strength of the Indian tribe in its neighborhood; with the passes by which the Indians are in the habit of entering the settlements, and those particularized through which the largest bodies pass.

The Indians being excluded from title to all lands by the statute law of Texas (whose constitution assumes now to include New Mexico,) are at an entire loss to know where are to be their boundaries, and where to be permitted to hunt and cultivate. Under these circumstances, I deem it very important that a general council should be held to the perfect understanding of what is required of them, in regard to the United States government itself, and the obligations imposed on us, by treaty, relative to Mexico.

In the instructions of the honorable Secretary of War to me, of the 4th of June, he observes, that with twenty-eight companies it is presumed it will be in my power to protect this frontier, taking into view the increased population of Texas, &c., &c. With twenty-eight full companies, I should feel strongly assured of carrying out the views of the honorable Mr. Crawford; but the companies are but little more than half full, and it may be computed, at this time, that the available troops in this department do not exceed one thousand men, including non-commissioned officers, musicians, and the sick. The organization of the company is now so small, that detaching from it the necessary extra and daily-duty men, and the sick, leaves but a very reduced force. I well recollect that
a sad mistake was made in this way in General Clinch's Seminole campaign, when the number of companies did not arrive at one-half of the force apparently represented in the report of General Cass. As coincident remark, I trust that the next Congress may increase the strength of the companies to one hundred, or at least to seventy-five. On this frontier and New Mexico it is not unfair to presume ourselves nearly in a state of war, and should be at all times prepared to enforce the views of our government. The immense body of Indians, over whom we are forced to exercise a sovereignty, induced by the annexation of large States and extensive territories, and the treaty with Mexico—habituated, from time immemorial, to plunder and depredation—require now to be checked and controlled. You will perceive, at once, the importance of the matter, and the difficulties and troubles which may be readily anticipated.

It is not my wish to make requisitions upon the executive of Texas for additional troops; neither will I do it, unless compelled by an imperious necessity.

I have the satisfaction to report that no Indian depredations have occurred for some time previous to my arrival, and that all the troops in the country are actively engaged in scouting and other appropriate duties.

The battalion of the 3d infantry, I understand, is progressing well, and were on the "Los Moros," not far from the Rio Grande, on the 30th of June.

I am, very respectfully, your obedient servant,

GEO. M. BROOKE,
Brevet Major General R. JONES,
Adjutant General, Washington, D. C.

HEADQUARTERS EIGHTH MILITARY DEPARTMENT,
San Antonio, August 11, 1849.

GENERAL: By despatches received this morning from Corpus Christi, I have been informed that within four or five miles of that point several persons have been wounded, some killed, and a German boy, with a large number of horses and other property, had been carried off by a party of Comanche Indians. They were pursued and overtaken by a squad of mounted rangers, lately ordered out by Governor Wood, killing four of the Indians, recaptured the boy, all the horses except three or four, with the baggage and provisions of the Indians. This despatch is supported by petitions signed by all the most respectable persons in that neighborhood, affirming their want of protection, and the great panic which exists regarding life and property. This is the first reliable information which has been received by me of Indians (real Indians) being in that part of the country. The conflict which has taken place between the whites and Indians, in which four of the latter have been killed, compromises at once the safety of the citizens occupying the southwestern part of this State, and may probably extend to other points as well as along the whole frontier. This makes it necessary for me to avail myself of the authority granted me by the President of the United States, to call on the executive of this State for a mounted force. Under these circumstances, I have not hesitated to make a requisition for three mounted companies. My letter
to his Excellency, and the order of to-day, are herewith enclosed. How far these disturbances may extend, it is out of my power to say; but I will venture to express that, as far as my means will warrant, the most active exertions will be made to meet all contingencies.

I have the honor, General, to be your most obedient servant,

GEO. M. BROOKE,
Brevet Major General, commanding.

Brevet Major General R. Jones,
Adjutant General, Washington, D. C.

P. S.—An express is sent to Lavaca to meet the New Orleans steamer.

HEADQUARTERS EIGHTH DEPARTMENT,
San Antonio, August 24, 1849.

GENERAL: I have the honor to forward the enclosed communication from Lieutenant E. L. Viele, first infantry, commanding at Laredo, received this day by an express. You will perceive that the course of these Indians is becoming more daring and outrageous, and it appears to me necessary that a considerable mounted force should be raised, and the war carried into their own country. The expense incurred will no doubt be great; but the exigency of the times demands it. Immediately on the arrival of the express sent by Lieutenant Viele to Ringgold barracks, the mounted company of artillery at that post was put in pursuit, and I am in hopes of learning in a few days of their overtaking and punishing this barbarian outrage. Yesterday two of the companies called for by me on the governor of this State, were mustered into service at Austin. The third, I presume, will be raised during the week, and the whole of them will be ordered to that section of country; that is to say, from the neighborhood of Goliad to the Salt lake, between Corpus Christi and the Rio Grande. Brevet Lieutenant Colonel Hardee, with two companies of dragoons, will be directed to act in concert, from the posts of Leona and Seco. The horses of these two companies are in bad condition for active service, being nearly broken down in scouting and pursuing Indian trails. I have ordered a partial remount. The number of men in each company is small.

I would like to have the approval of the War Department in mounting several companies of the 1st and 8th infantry, as it is impossible to act with efficiency without a mounted force of regulars, or calling into service more companies of Texas rangers.

I am, very respectfully, your obedient servant,

GEO. M. BROOKE,
Brevet Major General.

Brevet Major General R. Jones,
Adjutant General, Washington.

CAMP CRAWFORD,
Laredo, Texas, August 18, 1849.

Sir: I have the honor to submit the following report of the movements and depredations of the Indians, since the date of my last communication
to the headquarters of the department, premising that I have carefully traced to its source every item of information that I have received, and that I communicate nothing upon which perfect reliance cannot be placed. On the 21st of July a flat-boat belonging at this post, which had been sent up the river about twenty miles in charge of some laborers (Mexicans) to procure grass, was cut loose by the Indians while the men were at work on land, the former then concealing themselves for the purpose of a surprise; but being discovered, the Mexicans made a circuit and reached the river at a point where the boat fortunately grounded. They succeeded in getting into it, and reaching the opposite bank before the Indians could get near enough to effect anything, although they were constantly shooting arrows.

On the receipt of the information, I sent every man in camp, except a guard of three, to pursue the Indians. This party, which, including soldiers, teamsters, and laborers, amounted to but fourteen, was placed in charge of Lieutenant Johns, who followed the trail of the Indians until it crossed the river a few miles above the point at which they attacked the boat. They had crossed the night before, and during the following day attacked a train of pack-mules, killed and scalped one man, and drove off all the animals. The mules were owned in this town.

On the 12th of this month, a large party of Indians were seen at the San Juanita, about 20 miles from this place on the Corpus Christi road; and having a large number of horses and mules, it was supposed they were going into the interior; on the contrary, they went down the river, and were pursued by a party of Mexicans whose animals gave out. I was unable to pursue them, as the number of sick and discharges had reduced my command to nine men. I sent, however, an express to the commanding officer at camp Ringgold; but they travelled so fast as to reach the town of Roma, 17 miles this side of that post, before the express. On their route they are reported to have taken three children from a rancho opposite Guerrero, to have outraged the persons of three women at a rancho opposite Mier, and to have shot a woman in the town of Roma. From Roma they took a direction nearly perpendicular to the river.

I have studiously avoided giving credence to the many exaggerated reports which have been circulated with regard to the depredations of the Indians, and have on several occasions traced to their source newspaper articles which have originated at this place, and found them without foundation in truth; but since the late rains, and consequent improvement of the face of the country, the previously unfounded reports have been surpassed by the reality—every rancho on the river has been attacked within the last month. The Indians move in much larger bodies than before, and evince a total want of fear. With but nine men for duty, I can do nothing. The people work in their fields with their guns on their backs, and the more distant fields are abandoned. I have heard nothing of recruits for my company; and when they do arrive, it appears to me the low standard of the companies is inadequate for frontier defence.

I am, sir, very respectfully, your obedient servant,

EGBERT L. VIELE,
Second Lieutenant First Infantry, commanding.

To Major Geo. Deas,
Assistant Adjutant General, San Antonio, Texas.
HEADQUARTERS EIGHTH DEPARTMENT,
San Antonio, August 31, 1849.

GENERAL: I have the honor to forward the enclosed communication of Brevet Brigadier General Harney, (No. 1,) accompanied by a petition of citizens of Williamson and Milam counties for a company of mounted men to be raised in their neighborhood, (No. 2.) Previous to the reception of General Harney’s letter I had determined to establish a post at the point recommended, in consequence of the want of protection along the extensive district of country between Hamilton creek and Fort Graham. The great difficulty is the want of mounted men. I have an objection to placing rangers in immediate contact with the Indians on the frontier, as I am fearful, from their feeling, and, you may say, general and natural hostility to the Indians, that they would be very apt to bring about what we wish to avoid—a general war.

Under this view I propose to transfer the company of dragoons at Fredericksburg to the contemplated new post, to be supported by one of the infantry companies at Austin. The infantry company now at Fredericksburg has twenty-five horses, for as many mounted men; and this company to be supported by another infantry company from Austin—the remaining company at the latter point to be ordered to Hamilton creek. I can see no use or propriety in the three companies at Austin and the two at Buffalo being placed at those positions.

It is true I have the authority of the President of the United States to make requisitions on the executive of this State for a force of mounted men; yet I am indisposed to call for a greater number of troops than is absolutely necessary. The calling out of the three companies already seems to have greatly increased the desire of the people of this State for the raising of more—a feeling which I have to contend against.

From the tenor of General Harney’s letter, as well as the complaints set forth in the petitions, the course and action of the Indians is strongly marked by insolence and the appearance of hostility. Indeed, it may be said that a similar feeling seems now to be expressed by the Indians generally along the whole border. Their late robberies, murders, and rapes, on the Rio Grande, with other acts of theft and crime in other places, require an instant suppression, which I fear cannot be carried into effect without a considerable increase of mounted force; whilst, at the same time, we must make preparations for what may follow the necessary chastisement which these infatuated people must be made to experience. In laying before the honorable Secretary of War the opinions and statements expressed in the letters and petition, I fear that serious disturbances, if not actual war, may be the result; and I wish to prepare the government with the belief and knowledge of what may probably be anticipated and expected.

I also forward herewith two statements (Nos. 3 and 4) from Brevet Lieutenant Colonel Hardee, captain 2d dragoons, detailing the destruction of a party of Indians who had stolen horses and mules from his post on the Leona, all of which were retaken, besides others in possession of the Indians.

I am, very respectfully, your most obedient servant,

GEO. M. BROOKE,
Brevet Major General R. Jones,
Adjutant General, Washington, D. C.
SIR: From my letter of the 19th instant, and the accompanying report of Lieutenant T. J. Wood, 2d dragoons, the commanding general has learned that the settlements in the vicinity and north of Georgetown were visited, a few days previous to the date of those communications, by a band of Caddo Indians. It is unnecessary to recapitulate that it had been reported to me that they were disturbing the quiet of the inhabitants by their presence, and that it was to remove them, and to remedy this evil, that I ordered out the party under the officer referred to. Notwithstanding the peremptory orders they then received—in effect that they should not again cross the line connecting the exterior posts, and that they would be treated as enemies in case they should be found south of that line—in despite, also, of the circumstance that they were then forced to break up their encampment and commence to move beyond the line of habitations, they have, unaccompanied by their women and children, and in increased numbers, returned to the neighborhood which they were ordered to quit, and are now engaged in depredating on the property and interrupting the safety and peacefulness of the settlers. The depredations which they most usually commit consist in entering the enclosures of the more remote inhabitants and carrying away as much corn and other produce as they desire, in occasionally killing hogs, and less frequently stealing a horse. I have been informed that the Caddoes have stolen, since they last came to the settlements, six horses. As trivial as the injury may at first sight seem, it is, to the pioneer who is dependant on the small produce of his own year's labor for his subsistence, and who has not the means, should it be destroyed, to purchase from his more prosperous and secure neighbors, a matter of serious loss to have his humble field entered by a party of forty or fifty Indians, each provided with one or more horses.

The fact that the Caddoes have so soon returned, after having been ordered out of the habited country, unaccompanied by their women and children, and with an increase to their warriors, carries with it a strong savor of defiance of authority, and seems to me to merit punishment. Were I again to send out a party of soldiers simply to order them off, I should greatly expose my conduct to the charge, on the part of our own people, of inconsistency and weakness, and produce contempt of our authority among the Indians. Before, however, resorting to extreme measures, and treating them as open and avowed enemies, I desire to have the views and wishes of the General:

Previous to the adoption of any course which might involve us in a general Indian war, there is one point which should claim the care of the General, and to which I will venture respectfully to call his attention: it is, that many of the advanced posts are so far apart, and provided with such weak mounted garrisons, that it is utterly impossible to prevent the Indians from crossing the line connecting them, and that hence many districts of the frontier settlements are almost entirely without protection; these, of course, will suffer earliest and most severely in the event of a general collision with the Indians, and, consequently, should be looked to. As an example of the inability of the troops on the frontier to afford protection to every point, I refer to the relative position of the post on the
Brazos and of the post on the Colorado. These two posts, garrisoned each by one meagre company of dragoons, are between one hundred and thirty and one hundred and fifty miles apart, separated by a tract of most wild and broken country, through which the Indians can pass to the settlements below, without the slightest intimation of their transit ever being known to the garrison at either post.

They are evidently too far apart to afford secure protection to the inhabitants south of the line connecting them. I am informed that the main trail leading from the Indian villages—Caddoes, Weechis, Ionies, Wacos, and Wachitas—on the Upper Brazos, to the southern country, crosses the Leon river near the outlet of Conyel's creek. The crossing is hence a most excellent site for the establishment of a post. A post there, garrisoned with a simple mounted company, would do much to strengthen the northeastern portion of the line of defence, and add much to the quiet of the agricultural people in their homes, and the safety of their property.

I therefore recommend to the General, if he can by any means provide a mounted company for this purpose, to establish a post at the point indicated.

I send the General a petition from the citizens of Williamson and Milam counties to have a mounted volunteer company stationed so as to afford them protection from the inroads of the Indians. The region of country selected by them for the location of the post is in the vicinity of that which I have already alluded to.

The petition contains an erroneous statement in regard to the conduct of the Indians when ordered out of the country by Lieutenant Wood; they did not refuse to go, but departed when ordered, and have since returned.

Respectfully your obedient servant,

WM. S. HARNEY,
Major Geo. Deas, Asst. Adj't General,
Col. 2d Dragoons, &c.

[Enclosure No. 2.]

To General Harney, Commander of the post at Austin, Texas:

Your petitioners, citizens of Williamson and Milam counties, respectfully represent, that there now is a large number of Indians hovering around Georgetown, and on the waters of the St. Gabriel and Lampasses rivers, stealing horses and killing stock. They commenced stealing horses, &c., early last spring. They now are plundering cornfields, and refuse to leave, at the request of the owner, until they supply themselves with corn. They killed thirty head of hogs belonging to one man. They went to the house of Mr. Roberts a few days ago, when he was absent from home; Mrs. Roberts had a bridle on a horse, and was standing in the door, when they came up and ordered her to give up the horse. She refused; one of them caught hold of the bridle and took it away from her. She caught hold of the bridle again, and the Indian struck her in the face. She remarked, "Yonder come the white men—you had better leave."
Indian let go of the horse to look for the men, when she mounted the horse and rode away, leaving the Indians in possession of the premises. They have been requested by the citizens to leave, and have been ordered by Lieutenant Wood to leave, but they refuse to do so. They have sent away their squaws, and are manifesting a hostile disposition. The citizens are fearful that serious consequences will result from them unless protection is speedily afforded by the government. Your petitioners, therefore, pray that a company of mounted volunteers may be raised, to be stationed on the waters of the St. Gabriel, or on Cow-House creek, or on the Lampasas river, to afford protection to the above-named and adjoining counties.

Your petitioners pray that you will represent to General Geo. M. Brooke our defenceless situation, and lend us your aid in procuring the desired relief.

GEO. GLASCOCK,
WM. LACKEY,
and 119 others.

[Enclosure No. 3.]

MILITARY POST ON THE LEONA; August 26, 1849.

Major: I have the honor to report that two public horses and three mules, and three private horses, were stolen from this post on the night of the 23d instant. Three of these horses and the mules were taken from under the eye of a sentinel, who discovered the marauders, and fired at them, but not in time to secure the horses and mules, which they carried off. Three or four other horses had their halters cut, and were found outside the enclosure; they had also unhobbled and herded six or eight ponies belonging to some Mexicans, who had stopped here on their way to Presidio. These horses they evidently intended to carry away, but were compelled, in their flight, to leave behind. Two of the private horses carried off belonged to a gentleman who arrived that evening for the purpose of making some surveys in the neighborhood; the other was the property of Dr. Campbell, United States army.

I started Lieutenant Neill the next morning in pursuit. I went with him far enough to see that he was on the right trail; I gave him directions to follow on as long as there was any prospect of overtaking them; and, as he has a good-guide and two good trailers, I have some hopes of his success.

I felt as secure here from robbery by Indians, as if I had been in San Antonio. I have a working party on the Rio Frio; another is working on this river above me; the hay contractor, with his workmen, is in another direction; hunters and fishermen are out constantly, almost daily, yet not a sign of Indians has been discovered in the neighborhood since my arrival. My own tent and the tents of my men are about a hundred yards from the stable; two trusty non-commissioned officers sleep within the enclosure; a sentinel guards the horses, who cries the hours regularly; the guard-house is nearer the stable than the tents; the horses are all fastened with chain halters, which cannot be broken off without noise, and yet, I regret to state, horses have been stolen in spite of these precautions. At first, I thought it could not be Indians who had committed the robbery; but if they are not, they have taken great pains to deceive me: a pair of
moccasins, a bois d'arc stick, a piece of jerked beef, all left behind, show that they were Indians, or wished to make me believe so.

An express sent by me to Eagle Pass last Monday, returned on Friday. The non-commissioned officer reports that he discovered an Indian trail near the Nueces, going towards the Las Moras; the sign appeared fresh. My express from Seco also reports that he saw the foot-prints of Indians between the Sabinal and Comanche creek. To overtake Indians, it is necessary to start with twenty days' provisions, and to have a force sufficiently large to follow them to their settlements. I have made a requisition on Major Babbitt for eighteen additional pack-mules.

Respectfully, your obedient servant,

W. J. HARDEE,

Captain 2d Dragoons, Bvt. Lieut. Col.

Major GEORGE DEAS,
Assistant Adj't General, San Antonio, Texas.

[Enclosure No. 4.]

MILITARY POST ON THE LEONA, August 26, 1849.

Major: Lieutenant Neill has just returned, and I am happy to inform you that he overtook the Indians, and recaptured the horses and mules. He killed one Indian, and badly wounded another, who was tracked some distance by his blood. There were only two Indians in the party, and only two were seen by Lieutenant Neill and his party.

I send this by special messenger to Seco, as I consider it the most important news of the day.

Respectfully, your obedient servant,

W. J. HARDEE,


Major GEORGE DEAS,
Assistant Adj't General, San Antonio, Texas.

HEADQUARTERS EIGHTH MILITARY DEPARTMENT,
San Antonio, September 20, 1849.

General: In referring to your letter of the 20th of August, I regret to perceive that in my report to Major General Scott, of the affairs of the Indian frontier of this State, the honorable Secretary of War was induced to believe that I had called into the service of the United States the two hundred volunteers ordered out by the governor of Texas. This was not the case; these men were never recognised by me; neither have they, in any way, received orders from these headquarters, although I have been repeatedly requested by the governor to receive them. They were mentioned merely as a force in that part of the country, who would assist in the prevention of further Indian difficulties.

The requisition since made on the executive of this State for three companies of volunteers was compelled, by the act of several Indians having been killed by a party of the governor's troops, and would, in my opinion, compromise the safety of the advanced settlements—an opinion which has
been verified by the great excitement which it produced among the Comanches. I have now, at every post on the chain, two companies, and (in some instances, on the Rio Grande particularly, more) the half of each mounted. No further intelligence of an increased hostility has been received, and I am strengthened in the hope, from the disposition of the forces in this department, and their perfect readiness and preparation to meet any incursion, that peace may be still preserved. There is no officer of the army more sincerely and humanely disposed towards the unfortunate savage than myself; and, whilst I am willing to prevent and preserve the olive-branch, I must, at the same time, be prepared against the most treacherous and deceitful of all the races of mankind.

Enclosed you will receive a statement of the number of persons killed, wounded, and made captives by the Indians in the neighborhood of Corpus Christi; which, as soon as the inquiries which have been ordered shall be received, of similar acts in other parts of the country, will, I fear, be greatly increased. Had such aggressions been committed by any other people or nation, what would have been the recourse of our government? War to the knife, and extermination, if it was continued. Forbearance has been shown in a degree never surpassed.

I beg leave to mention incidentally, that the two companies which have been mustered into service are equal in efficiency, and more particularly for the kind of duty to be performed, to any troops in the service. The third company I expect to-day. To show the necessity of this force, the night before Captain Ford's company arrived at Corpus Christi, seventy-five mules and other property had been stolen by the Indians; and in a few hours after the intelligence was received by the commander, his company was in pursuit, having been detained only in drawing their arms and provisions.

I have the honor, General, to be, very respectfully, your most obedient servant,

GEORGE M. BROOKE,

Brevet Major General R. JONES,

Adjutant General, Washington, D. C.
List of the names of men killed and wounded, of the women and children killed or carried off captives, between 1st January and 31st of August, 1849, citizens and residents of Corpus Christi.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name and occupation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>James Walsh, teamster</td>
<td>Killed coming from Mier to Corpus Christi in April.</td>
</tr>
<tr>
<td>2</td>
<td>Leoncio Gonzalez</td>
<td>Killed whilst escorting a team from Corpus Christi back from Mier in April last.</td>
</tr>
<tr>
<td>3</td>
<td>Francisco Vela</td>
<td>Killed at the Baranco Blanco in May.</td>
</tr>
<tr>
<td>4</td>
<td>Juan Vela</td>
<td>Killed at Casa Blanca in April last.</td>
</tr>
<tr>
<td>5</td>
<td>Julian Ortiz</td>
<td>Killed in sight of Corpus Christi in May last.</td>
</tr>
<tr>
<td>6</td>
<td>Jose Zapate</td>
<td>Killed at the Alazan in May and June.</td>
</tr>
<tr>
<td>7</td>
<td>Juan Cugillas, Herdmen</td>
<td>Killed near Corpus Christi in August.</td>
</tr>
<tr>
<td>8</td>
<td>Anastacio Trevino</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Clementi Garcia, a herdsman</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Angel Guzman, a herdsman</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Joaquin Zimora</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Antonio Cabazos</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Tomas Barrero, Herdmen</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Felipe Zalazar</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Aquirito Martinez</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>William Stewart</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Felipe Pezuela, Laborers</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Antonio Pea</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Ambrosio Vasquez</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>An American</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>An American</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Guadalupe Redouri</td>
<td>Killed coming from Guerrero to Corpus Christi in August last.</td>
</tr>
<tr>
<td>23</td>
<td>Mr. Carlite</td>
<td>Killed at the Sta Tereza on their way to Corpus Christi in April.</td>
</tr>
<tr>
<td>24</td>
<td>A Mexican</td>
<td>These two men (unknown) were found dead at the Alazan in May last.</td>
</tr>
<tr>
<td>25</td>
<td>A Mexican</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>A Mexican</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Cecelio Balero</td>
<td>Wounded at the St. Jetrudes in April last.</td>
</tr>
<tr>
<td>28</td>
<td>Anastacio Flores</td>
<td>Wounded at the Baranco Blanco in May last.</td>
</tr>
<tr>
<td>29</td>
<td>Thomas Gomez</td>
<td>Wounded at the Baranco Blanco in May last.</td>
</tr>
<tr>
<td>30</td>
<td>Juan Salazar</td>
<td>Wounded in sight of Corpus Christi in May.</td>
</tr>
<tr>
<td>31</td>
<td>Rafael Villaneal</td>
<td>Wounded coming from Guerrero to Corpus Christi in August.</td>
</tr>
<tr>
<td>32</td>
<td>Teresa Gonzales</td>
<td>Killed or made captives coming from Mier to Corpus Christi in April.</td>
</tr>
<tr>
<td>33</td>
<td>Maria Gonzales</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Josefa Gonzales</td>
<td></td>
</tr>
</tbody>
</table>
List of the names of killed and wounded, &c.—Continued.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name and occupation.</th>
<th>Remarks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Juan Balero.</td>
<td>Made captive at the St. Iturus in April last.</td>
</tr>
<tr>
<td>36</td>
<td>John Wheilder.</td>
<td>Made captive in sight of Corpus Christi in August.</td>
</tr>
<tr>
<td>37</td>
<td>Three children (unknown).</td>
<td>Made captives coming from Guerrero to Corpus Christi in August.</td>
</tr>
</tbody>
</table>

The foregoing list of killed, wounded, and captives is, to the best of my knowledge and belief, correct.

Corpus Christi, September 7, 1849.

H. L. KINNEY.
HEADQUARTERS EIGHTH DEPARTMENT,  
San Antonio, September 27, 1849.

General: I have great satisfaction in forwarding the enclosed communication from Brevet Captain Steele, second dragoons, senior officer at Fredericksburg in the temporary absence of Lieutenant Colonel Fauntleroy.

I shall reciprocate fully, this apparent friendly disposition of the Comanches, and sincerely hope that the dangers of collision have passed away.

I am at the same time convinced that the very serious talks which have been sent them, and knowing our state of preparation, added to the severe chastisement which they have lately received, in two instances, have produced their proper results.

I have the honor to be, very respectfully, your obedient servant,

GEO. M. BROOKE,  
Brevet Major General.  

Brevet Major General R. Jones,  
Adjutant General.

CAMP, NEAR FREDERICKSBURG, TEXAS,  
September 22, 1849.

Major: I have the honor to report that I have to-day received a visit from two Comanche chiefs, Pro-pro-whop, or Buffalo-hump, and Rey-turn-see, who are direct from the camp, on the Clear Fork of the Brazos, for the purpose of communicating the result of a council lately held by the whole Comanche nation, to elect a successor to Mo-per-cho-co, late head chief, he having died since our last intelligence from the camp on the Brazos.

The election resulted in the choice of Buffalo-hump, who, upon assuming the dignity, called upon all the chiefs and warriors to speak their minds freely with regard to their relations with the whites.

The council lasted ten days, when it was finally determined that they would be great fools to war with the United States. They had been to war with Texas when Texas was weak, and they had gained nothing by it; and now that Texas was joined to the United States, a war would lead to the destruction of their nation.

Buffalo-hump says, that although he may not be able to stop at once small thieving parties, he is determined to preserve peace, and he hopes that these small parties will not be considered by the whites as a cause of war.

He also wishes me to say, that in event of a council, it is the wish of the Indians that it be held at the Llano, or at this place.

I have the honor to be, with the highest respect, your obedient servant,

WM. STEELE,  
Brevet Captain, commanding at Fredericksburg.

Major Geo. Deas,  
Assistant Adjutant General, San Antonio, Texas.
HEADQUARTERS EIGHTH DEPARTMENT,
San Antonio, Texas, October 2, 1849.

General: I have the honor to forward De Cordova's map of Texas, showing you the chain of posts at present established, which I presume will remain, with possibly some slight changes, dependent on more suitable locations in the immediate vicinity, as the health of the troops, materials for building, fuel and water, and subsistence and forage, may be better and more abundant. All those posts are now occupied by two companies each, and one of them mounted, with the exception of Eagle Pass and Fort Brown, where there are four companies at the former and three at the latter, all of the first infantry, and at each one company mounted. Eagle Pass and Fredericksburg, I think you will observe, by their positions on the map, are the most commanding on the frontier. Eagle Pass should be the headquarters of the first infantry, and Fredericksburg will receive an additional company, as soon as I am able to supply them. In the event of any large and sudden incursion of the Indians, I can concentrate, at a very short notice, six mounted companies at any designated point, which will probably be a force sufficiently strong to drive back and punish any party of Indians who might dare such an outbreak. All these posts will be held secure by the infantry companies left. This line of posts is, I believe, as good a one as can be had for some years to come, and is rather in advance of the settlements, excepting in the case of Fredericksburg, where a German village, on the Llano, has been located. If any other line of frontier is advanced, the population will follow and go beyond it.

In looking at this subject, if we move further on, what lands are to be left for the poor Indian, from whom Texas has taken every foot, as she has done from the Catholic church? As a humane and just people, are we to deprive the aboriginal proprietors of their whole country, who have not as yet lost it either by conquest or purchase?

As soon as I shall be able to clear the country of the savages, thieves and murderers who now infest it from Goliad to the Rio Grande, along the coast on the Nueces and Frio Rivers, up to Eagle Pass and Leona, I request to be authorized to discharge the three companies of mounted rangers, called out by my requisition on the governor of this State of the eleventh of August last.

They are now operating very efficiently; and, for the kind of troops, are most orderly and obedient. The headquarters of each of these companies is marked on the map, and you will perceive the district of country they are intended to cover.

In ten days from this the train of subsistence, intended in part to resupply and provision, until the first of June next, the six companies of the third infantry at El Paso under escort of two mounted companies, one taken from this post and the other from Eagle Pass, will take its departure.

As I feel very little apprehension of Indian disturbances since the report of Brevet Captain W. Steele, second dragoons, which has been forwarded to your headquarters by the last mail, I have directed Lieutenant W. H. C. Whiting, corps of engineers, to commence a military reconnaissance of the whole frontier, and from whom a most interesting and important report may be expected.

Lieutenant N. Michler, topographical engineers, under instructions of
Colonel Abert, his chief, is now engaged in a survey between the south branch of the Red river and the Pecos.

Brevet Lieutenant Colonel Johnston, topographical engineers, has not yet returned from El Paso Del Norte, and will not probably arrive here before the first of next month.

I am, very respectfully, your most obedient servant,

GEO. M. BROOKE,

Brevet Major General.

Major General W. Scott,

Commanding in chief, West Point, New York.
War Department, Washington, July 11, 1849.

Sir: An appropriation of fifty thousand dollars having been made at the last session of Congress, to defray the expenses of surveys of routes from the valley of the Mississippi to the Pacific ocean, you will take the proper steps to carry out the object contemplated by Congress. For the present, operations will be confined principally to the country between the Mississippi and the Rio Grande, with a view of ascertaining the most practicable route for a railway or wagon road; and it is proposed to start from some point on the Mississippi river, and make examinations of routes not hitherto explored.

Between St. Louis and Santa Fe, it is understood, reconnoissances have already been made. Between La Vaca, on the Gulf of Mexico, and El Paso, a route has recently been explored by Lieutenant Whiting of the engineers, who has made a report thereon. It is suggested that, in the surveys now to be made, the starting point shall be somewhere on the Mississippi, between St. Louis and Natchez; and from an examination of the map of the country, it has occurred to the department that a practicable route would be found commencing at or near Vicksburg, and pursuing a westerly course, and after crossing the Red river, following on the plains, as nearly as the nature of the country will admit, the south or right bank of that river up to its sources, through the pass at Mount Guadalupe; thence following the valley of the Puerco in a southerly direction, and, crossing that river, the Rio Grande can be reached at or near El Paso through a pass in the Guadalupe mountains. Or from Mount Guadalupe, following the valley of the Puerco in a northerly direction, the Rio Grande may be reached through passes north or south of Mount de Caballas.

The Red river, west of its great bend or curve, presents a remarkable feature—that whilst it has almost a due westward course, nearly all the rivers which flow into the Gulf of Mexico through the southern portion of Texas have their sources near its right bank. Indeed, it has been represented that the ridge is so narrow, that in many places the waters of the Trinity, Brazos, and Colorado are but a few paces from those of the Red river. Assuming that the course of the latter is correctly delineated, its southern margin must be admirably adapted for a road, as combining two necessary qualities—abundance of water and shortest distance.

Another route is suggested for examination, which should begin opposite Memphis or Cairo, or at St. Louis, and proceed toward the valley of the Arkansas river, and thence up the same to the confluence of the Canadian rivers. Pursue the course of one of them, till the ridge is reached which divides its waters from those of the Puerco. This point being attained, it is believed that the valley of the Rio Grande may be thence reached by the route heretofofore indicated.

The surveys west of the Rio Grande will be confined to a space between
that valley and the Sierra de los Mimbros, with the view of finding a pass through it. Accordingly, it is recommended that the survey be extended from a point opposite El Paso to some point near Taos.

The survey which is now in progress from Fort Hall to the Salt lake, and which is finally to be completed from St. Joseph springs, near the Wahsatch mountain, to Santa Fe, will be an important auxiliary in deciding on the route to California—whether by the valley of the Gila, or the one just adverted to. Hence, I commend to your consideration the great importance of ascertaining if any pass suitable for a road can be found on the Sierra de los Mimbros, within the points herein designated.

Either in respect to a railway or wagon road, the officers detailed for the service will extend their observations so as to comprehend all objects calculated to advance or retard either work, and report accordingly.

It is important that the surveys be commenced without delay, to the end that the report may be laid before Congress at an early day of its coming session.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,

Colonel J. J. Abert,

Corps of Topographical Engineers.
OPERATIONS IN CALIFORNIA.

SIR: Your despatch from Mazatlan, dated the 15th of February last, has just been received. The want of information concerning the internal condition of California at the present time, almost excludes the idea that any special instructions can be given to you, applicable to the emergencies existing or that may exist there. The President relies with great confidence on your ability and judgment to meet such emergencies, when they arise.

Touching the internal regulations of California, it is presumed that a government de facto remains, or has been established in it; that it rests on the consent of the inhabitants under it, and that its chief authority is exercised for the protection and security of the rights of persons and property. California being a part of the territory of the United States, must be regarded as subject to the constitution, and all laws made in pursuance thereof; and hence, any regulation in opposition to them will be considered as having no binding effect. With this limitation, such a government will be respected and aided by you in the exercise of its functions.

The defence of the territory against foreign invasion, and the preservation of internal tranquillity from civil commotion, will be objects of your care, and may require the exercise of your authority. The duty of regarding the obligations of the treaty lately concluded with the republic of Mexico, is now superadded; especially those provisions which relate to the time when the resident Mexicans are required to make their election of citizenship, and others who may choose to remove with their property beyond the limits of the United States, into Mexico. The promise to incorporate the first class into the Union, with all its attendant privileges and blessings, may, and doubtless will, be a subject of deep concern to Congress, which alone can admit them as a component part of our confederacy. Your observation and intercourse will furnish ample opportunities of knowing their probable number, habits of life, and capability to receive and maintain our republican institutions.

The plan of establishing an independent government in California cannot be sanctioned, no matter from what source it may come. The territory belongs to the United States, and should be defended against all attempts to weaken or overthrow their authority. Already have the revenue laws and those pertaining to the post office been extended over them, and appropriate officers appointed to execute them. An independent government, as contemplated by your letter, would either suspend or set aside the force of these laws, and the functions of these officers. The President cannot permit the exercise of any authority in conflict with that which he is bound to maintain, by taking care that the laws be faithfully executed.
Desertions from the army in California appear to be without remedy. In other localities, where the temptation is not so great as in California, desertions are frequently occurring. Without the pride of the soldier in his corps has been awakened, the usual restraints and penalties have proved ineffectual. The proposed separation of detachments to be sent forward as far as may be practicable, consistently with the public service, from the scene of attraction, as well as all other legal measures of precaution in preserving the efficiency of the forces under your command, cannot fail to meet the approval of this department.

It is believed that the trespasses by gathering and carrying away gold from the "placers" on the tributaries of the Sacramento river, have been committed, in a great measure, by foreigners, on lands that are claimed by or are in the occupancy of Indians. The necessary control which the United States exercise over all savage tribes in their territory cannot be diminished or exposed to the hazard of diminution, by permitting foreigners to enjoy an unrestricted intercourse with them. The act of Congress passed in 1834, "to regulate trade and intercourse with the Indian tribes, and preserve peace on the frontiers," was intended to prevent, in part, the evils supposed to arise from foreign influence. The form of the remedy will appear sufficiently clear, by an examination of the several provisions of this act.

By a recent act of Congress, the Bureau of Indian Affairs has been separated from this department, and placed under the control of the Secretary of the Interior. The proper officers for the management of Indian affairs in California have been appointed by that department, who will repair with convenient despatch to the scene of their duties. With them you will consult and co-operate, in all matters relating to cases requiring joint action.

Your attention is directed to a copy of a communication lately received at this department from the Secretary of State, in which the resident consul of Peru, at Washington, has complained of certain acts of those charged with the collection of the customs at San Francisco, in June last. A copy of a communication submitted by Mr. Osma is herewith transmitted, and will furnish the necessary data for the inquiry into the cause and extent of the alleged wrong. The relation that California then occupied to the United States, as a conquered province and subjected to military powers, presents a case fit for your inquiry. The result you will communicate to this department, to the end that the Secretary of State may reply definitely to the Peruvian consul.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

General Persifor F. Smith, United States Army,
 Commands Pacific Division, California.

HEADQUARTERS THIRD DIVISION,
San Francisco, April 16, 1849.

Sir: It is no doubt a matter of great interest to the government to have some accurate information relative to the actual product and probable wealth of the gold mines in Upper California. But there are no means of
collecting facts in an authentic form in the country where the gold is found. The enormous expense attending a visit and residence there can only be incurred by some one who partakes of the advantages of laboring or trading there, and is utterly beyond the means of any whom I am authorized to send.

The estimate of the amount produced up to the 1st of this month, which I have stated in my report to the Adjutant General at about four millions, was founded on a comparison of the calculations of different persons who had been at the mines, and of those who traded with the miners. I mentioned in the report that I was collecting some facts which might fix the amount with more certainty.

These facts are set forth in the enclosed documents from the person acting as collector of the revenue here; being, first, "A statement of the quantity and value of the goods, wares, and merchandise imported into the port of San Francisco, district of California, from October 1, 1848, to March 31, 1849;" and, second, "A statement of gold dust exported from the port of San Francisco from October 1, 1848, to March 31, 1849."

By the first, it appears that the amount of goods received at this port was, during the six months mentioned, $1,089,801.85. Though some of these remain unsold because they do not suit the market, yet that amount is more than balanced by the amount of gold dust not yet brought into market. The goods which have been sold have averaged two hundred per cent. on the invoice value, though the whole amount would not give that rate, as some are unsold. The amount of goods sold would, then be, in even numbers, $3,250,000. Now, every part of this has been paid for in gold dust; for all other business has been abandoned which formerly gave a foundation for commerce. And if the amount carried out by those who first procured it be estimated at $1,000,000, as it generally is, it would show a probable yield of the mines of $4,250,000. A small trade has been carried on at Monterey and some of the southern ports, which, as this result is only approximative, need not be calculated.

By the second statement, it appears that the amount actually exported and declared in the custom-house in the same period is $2,842,040. The amount carried out by individuals without being declared-by sea, and to Oregon and Sonora by land—is estimated at $1,000,000. And there is here and near the mines about $300,000; making, in all, about $4,642,000. The estimate of what is here and at the mines is pretty accurate; if that taken out without being declared be reduced one-half—and no one puts it lower than $600,000—there will still remain something near the result of the first calculation, viz: $4,250,000, for the six months ending April 1.

But the period of low water, from June to December, is that of greatest product in the mines; and this year, the force at work there will be at least quadrupled, (if half we hear be true, it will be decupled,) and will have the advantage of better tools and machinery: so that, supposing the gold most easily got has already been gathered, the product of the next twelve months will be from twelve to twenty millions of dollars. And if it be not a scattered deposit on the surface, but the indications of deeper and richer veins, the amount must be still greater.

Two important consequences may follow a very large production of gold, viz: a large increase of the circulating medium of the commercial world; with a corresponding decrease of its value, and consequently a
rise in the nominal value of all other articles; and, secondly, a change in
the relative value of gold and silver.

I cannot believe that either of these evils will be felt very suddenly or
to a great extent, demanding special measures of prevention. As to the
second, it may be said that if gold becomes cheaper, silver will be rela-
tively worth more than it now is, and its production increased; for there
are some discoveries of silver in South America as wonderful as that of
gold here.

The discovery of the American silver mines, and the immense addition
of that metal to the circulation of the world, was many years in changing
materially the state of the market. Several hundred millions were pro-
duced before the effect was very apparent. But refer to the state of agri-
culture and manufactures at that time; see in how few channels money
could be directed with profit; and it is evident that a comparatively small
surplus would soon find obstruction, and choke up the way for its own
progress. Now, ten times the same amount; instead of waiting inactive
for investment, would be instantly absorbed by the thousand demands of
modern industry and enterprise for capital, and, instead of overflowing
and ruining the existing channels of trade and commerce, would open
many new ones, in proportion to its power of supplying them. So far
from foreseeing any evil in the augmentation of gold from these mines, I
believe it will only give new life and activity to our country, where we
have land, enterprise, industry, and skill, waiting only for capital to make
them productive. And thus a far greater benefit will ensue than if one-
half of the gold went into the public treasury.

With respect, your obedient servant,

PERSIFOR F. SMITH,

Brevet Major General, commanding division.

Hon. Secretary of War.

HEADQUARTERS PACIFIC DIVISION,
Sonoma, California, August 26, 1849.

Sir: At the time of the departure of the last mail for the Atlantic
States, I had not yet returned from a journey through the mining districts
in the mountain at the western foot of the Sierra Nevada, and was not in
communication with San Francisco until after the steamer had left. As
the return for this department for May only reached division headquar-
ters three days ago, and nothing of any moment had transpired in the
division, there was nothing of importance to communicate.

The two last companies of the 2d infantry arrived in July; they have
since lost many men by desertion. The points occupied by troops
in this department now are San Diego, Monterey; the Presidio of San
Francisco, Benicia (the general depot,) Camp Stanislus, on the river
Stanislaus, about 25 miles SSE. from Stockton; and Major Kingsbury,
with a command, is directed to occupy a point about 30 miles NNW.
from Suter's Fört. It is uncertain when he will reach it.

San Diego and Monterey are harbors. The Presidio of San Francisco,
24 miles from the town, is near the entrance of the bay, where there is
a small dilapidated work. Benicia, about 26 or 30 miles from the sea, ac-
cessible to the largest ships, just below the junction of the Sacramento
and San Joaquin rivers, is the general depot.
The other two posts on the upper waters of those two streams were intended to have an influence on the mining districts and the neighboring Indians, but principally as auxiliary depots from which expeditions could be supplied when about marching towards the mountains. They lie beyond the immense marshes surrounding the rivers, and which are often impassable; and from these posts any part of the mines, mountains, or country beyond, can be reached by troops at any season, though during the latter part of the rainy season the difficulties of travelling anywhere in the country (except on the bays and large rivers) are almost insurmountable. The cost and difficulty of transportation, and other causes, have hitherto prevented the complete establishment of these posts.

General Riley proposes to increase the number of posts. I do not think this advisable, except placing one near the Oregon frontier, between the Sacramento and the sea, when the country shall have been explored. It is preferable to have a column or two moving through the country; small scattered posts are the graves of activity and enterprise.

I have sent Captain Warner, topographical engineer, with an escort to make an accurate examination of what is indicated as the best route from Humboldt's river to the Sacramento. He is directed to ascertain if this route, especially the pass through the mountains, be practicable for a railroad. The season remaining for this purpose is very short.

There are very few houses in the country, and the expense of all kinds of labor is so enormous that it is difficult to build. Nevertheless I have directed the erection of temporary quarters and storehouses at the general depot, to cover, if possible, the garrison and stores before the rains. For the other posts, frame, or rather iron buildings should be sent from the Atlantic. None of the apparently exaggerated reports of the price of labor here reach the truth.

I start to-morrow for Oregon, and expect to be here again on the 10th of October, as my examination of the mining country will not be completed until I have visited the country near latitude 40 and 41. I postpone a general report until my return.

I have to regret exceedingly that the steamers Edith and Massachusetts have been transferred to the navy. The prevailing winds here are constant from the northwest, and sailing-vessels go northward with great difficulty. They dare not approach an unknown part of the coast to examine it, as it is rocky, without anchorage and a lee-shore.

Your obedient servant,

PERSIFOR F. SMITH,
Brevet Lt. Col. W. G. FREEMAN,
Assistant Adjutant General, Headquarters of the Army.

WAR DEPARTMENT,
Washington, June 26, 1849.

Sir: The latest despatch received from the Pacific is dated the 1st ult. Under the belief that Brevet Major General Smith will be absent on the arrival of this communication, I have addressed it to you as the military commander of the tenth department.

From all the information derived from your department, it is manifest

...
that your command will be surrounded by temptations to insubordination and desertion, which will be most difficult to resist. It has heretofore been suggested that the forces should be kept separated from the mines as far as the public service would justify; and yet it seems manifestly proper that a military force should be stationed near the mines to quell those occasional disturbances which may arise in that region, where such an immense population is flocking, and the rights of property and person are so insecure. To preserve the tranquility of the territory, and repel Indian and other invasion, will be the chief duties of your command.

In connexion with this subject, it is deemed proper that I should say that any plan or scheme calculated to weaken the authority of the United States in the territory will not be tolerated. Whatever of force may be levied or used to put aside this authority, will be resisted.

The revenue and post office laws of the United States have been extended over California; so, also, it is believed that the act of Congress of 1834, "to regulate trade and intercourse with the Indians," is of force there.

It is equally true that all laws existing and of force in California at the period of the conquest are still operative, with the limitation that they are not repugnant to the constitution and laws of the United States. In my opinion, these constitute the whole code of laws now of force in California. I should add that this opinion does not infringe on the right of communities to make necessary regulations for the police and security of persons and property. Such regulations must necessarily be temporary, as they are presumed to be voluntary, and designed to meet emergencies and difficulties which the sovereign power will take the earliest occasion to remove.

The United States are doubly bound to admit the newly acquired territories—California and New Mexico—into the confederacy of the States. It is not necessary to inquire whether the first step in view of the proposed incorporation should be taken by the people of the territories, or by the invitation of Congress. In either case, the final judgment rests with Congress. Hence, the opinion is advanced that it is the right of the people of California to assemble, by their delegates, and adopt a form of government which, if approved by Congress, may lead to their admission into the federal Union as one of the confederated States.

The Adjutant General has received the necessary instructions to communicate with you on the subjects embraced in General Smith's and your despatches.

I am, very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

Brevet Brigadier General BENNET RILEY,
Monterey, California.

CIVIL AFFAIRS,

EXECUTIVE DEPARTMENT OF CALIFORNIA,

No. 1.

General: I have the honor to transmit herewith copies of all civil correspondence and papers since the 13th of April last, at which time I relieved Colonel Mason of his duties as governor of California.
It was (with the advice of Colonel Mason) my intention, on assuming the direction of civil affairs in this country, to complete the organization of the existing government; at the same time, to call a convention for forming a State constitution, or plan of territorial government, to be submitted to Congress for its approval. But on further consultation, it was deemed best to postpone all action on this subject until I could ascertain what had been done in Congress. On the 1st instant, I received reliable information, by the steamer "Edith," that that body had adjourned without organizing any territorial government for this country; and accordingly, on the 3d instant, I issued my proclamation to the people of California, defining what was understood to be the legal position of affairs here, and pointing out the course it was deemed advisable to pursue in order to procure a new political organization better adapted to the character and present condition of the country. The course indicated in my proclamation will be adopted by the people almost unanimously, and there is now little or no doubt that the convention will meet on the 1st of September next, and form a State constitution, to be submitted to Congress in the early part of the coming session. A few prefer a territorial government, but I think a majority will be in favor of a State organization, so as to avoid all further difficulties respecting the question of slavery. This question will probably be submitted, together with the constitution, to a direct vote of the people, in order that the wishes of the people of California may be clearly and fully expressed. Of course, the constitution or plan of territorial government, formed by this convention, can have no legal force till approved by Congress.

On the receipt of the treaty of peace with Mexico, doubt was entertained, by a portion of the people here, respecting what constituted the legal government and laws of the country. A few contended that all government and all laws in California were at an end; and that therefore the people, in their sovereign capacity, might make such government and laws as they should deem proper. Accordingly, in two of the northern districts, local legislative assemblies were organized and laws enacted for the government of the people of these districts. The members of the Sonoma Assembly, however, soon became convinced of their error, and that body was dissolved. But in San Francisco the "assembly" continued its sessions, making laws, creating and filling offices, imposing and collecting taxes, without the authority and in violation of law and finally went so far as to abolish the office of alcalde, whose records and papers were seized and forcibly removed from his custody. On receiving official information of these facts, I issued my proclamation of the 4th instant. Since then I have made a personal visit to San Francisco, and find that the more respectable members of the so called district assembly are convinced of the impropriety of the course pursued by that body; and, in a very short time, I think, all the difficulties will be amicably arranged. These difficulties arose in part from a misapprehension as to what constituted the legal government of the country, and in part from the unpopularity of the 1st alcalde of that district, against whom serious charges had been made. Unfortunately, there was at the time no legal tribunal for investigating these charges; and there being no other magistrate in that district, I could not with propriety remove him from office. A new election, however, will soon be held to supply his place, and on the organiza-
tion of the "superior court," the charges against him can be properly investigated.

(The publication of a portion of the instructions received from Washington, respecting the government of this country, and the disposition manifested by the authorities here to enforce the existing laws, have done much to remove the erroneous opinions which were for a time entertained by a portion of the people of California. The civil government of this country has been and will continue to be administered on the principle laid down by the Superior Court of the United States, viz: "On the transfer of the ceded territory it has never been held that the relations of the inhabitants with each other undergo any change. Their relations with their former sovereign are dissolved, and new relations created between them and the government which has organized their territory. The mere act which transfers their country, transfers the allegiance of those who remove in it; and the law which may be denominated political is necessarily changed, although that which regulates the intercourse and general conduct of individuals remains in force until altered by the newly created power of the State."

"The treaty is the law of the land, and admits the inhabitants of [California] to the enjoyment of the privileges, rights, and immunities of citizens of the United States. It is necessary to inquire whether this is not their condition, independent of stipulation. They do not, however, participate in political power; they do not share in the government till [California] shall become a State. In the mean time [California] continues to be a territory of the United States, governed by virtue of that clause of the constitution which empowers Congress to make all needful rules and regulations respecting the territory and other property belonging to the United States."

When we take into consideration the great mass of floating population of the United States, and of other countries—people of all nations, kinds, and tongues—which has been suddenly thrown into this country, it must be acknowledged that everything has thus far remained remarkably quiet, and that the amount of crime has been much less than might, under the circumstances, have reasonably been expected. It is to be feared, however, that during the coming winter, when large numbers of the miners collect in the towns, public order may be occasionally disturbed. But it is believed that in the mean time a more complete organization of the existing government will be effected, so as to enable the authorities to enforce the laws with greater regularity and efficiency.

Rumors have reached us that there is no very amicable feeling existing between the Americans and foreigners in the gold regions, and that the former are disposed to forcibly expel the latter from the placer districts. I shall soon visit the valleys of the Sacramento and San Joaquin, and hope to be able to report upon the true state of affairs there by the August steamer. As Congress has declined passing any laws restricting the working of the placers, I shall not deem myself authorized to interfere in this matter any further than may be necessary to preserve the public tranquillity. Indeed, there is much reason to believe that Congress has pursued the best policy, under the circumstances, in leaving the placers open to all, for it would be exceedingly difficult to enforce any regulations not absolutely required by the necessity of the case; and it is more than probable that any attempt at this time to rent out the mineral lands, or to tax
their products, would involve a great expense, and it is quite possible that such an attempt would lead to very serious difficulties. Of the large numbers who have been attracted to this country by the flattering prospect of sudden wealth, and with the intention of returning to their former homes to enjoy their gains, many foreigners, as well as Americans, are becoming established in business, and will make California their permanent place of residence. It is therefore well worthy of serious consideration, whether the present system may not prove equally beneficial with that of a more exclusive policy. It certainly conduces much towards developing the resources of the country, extending its commerce, and rapidly augmenting its wealth and population. As soon as I have made a personal examination of the gold regions, I shall be prepared to express my views on this subject; but I cannot omit the present occasion to urge upon the government the importance of establishing a mint in California with the least possible delay.

Information, not official; has been received that the revenue laws of the United States have been extended over this country, and that a collector and deputies may be soon expected to take charge of the collection of revenue in this district. On their arrival, all custom-houses and custom-house property will be turned over to them, and the temporary collectors employed by my predecessor and by myself will be discharged. The moneys collected during and since the war, under the direction of the governor of California, and not required for defraying the expenses of the existing civil government, will be kept as a separate and distinct fund, subject to the disposition of Congress. The grounds upon which this revenue has been collected since the declaration of peace, are fully stated in a letter to the collector of San Francisco, dated the 24th of February last. It may be proper to add, that the course pursued by my predecessor was rendered absolutely necessary by the peculiar circumstances of the case. The wants of the country rendered it imperative upon him to permit the landing of foreign goods in this territory; and had this been done without the collection of duties, large amounts of dutiable goods would have been placed in depot on this coast, to the manifest injury of the revenue, and prejudice to our own merchants. The importers have sold their goods at such prices as to cover the duties paid, and still leave them enormous profits; and to now return these duties to the importers would be a virtual gift, without in any way benefiting the people of California. But to expend this money in objects of public utility in the country, would confer a lasting benefit upon all. I would therefore recommend that such portions of these moneys as may be left after defraying the expenses of the existing civil government, be given to California as a "school fund," to be exclusively devoted to purposes of education. No difficulty has been experienced in enforcing the tariff of 1846, and the revenue has been collected at a very moderate expense, considering the peculiar circumstances of the times. All officers of the civil government of California will be paid, out of the "civil fund" arising from the customs, the salaries fixed by law; and I would recommend that those officers of the army and navy who have been employed as collectors and receivers of customs, both during and since the war, be allowed a fair per centage on the money which they have collected and disbursed. Two and a half per cent. on the amount collected, with the restriction contained in section 2d of the act of March 3, 1849, is deemed a fair allowance for collecting these
customs; and two and a half per cent. on the amount actually expended, is deemed ample compensation for keeping and accounting for the same. It would be more just and proper to make the allowance for the actual expenditures, than for receiving and keeping these moneys; because, if the revenue rule was established, officers who have received large sums, and within a few days transferred them to others, with no other trouble than merely passing receipts, would be entitled to a higher pay than those who had all the trouble of expending this money in small sums, and in keeping and rendering accounts for their expenditures.

As soon as these "civil funds" can be collected from the officers now holding them, it is proposed to place them in the hands of some officer, or other responsible person, who will act as treasurer for the civil government, with a fixed compensation for his services. On the arrival of the regular collector and deputies, appointed according to law, a full statement will be made of all the moneys collected in California, and the papers and accounts connected with the expenditure of this "civil fund" will be sent to Washington, as heretofore, in order that all officers who shall receive or expend the same money may be held to a strict accountability.

Very respectfully, your obedient servant,

B. RILEY,
Brevet Brig. Gen. U. S. Army; and Governor of California.

Major Gen. R. Jones,
Adj't Gen. of the Army, Washington, D. C.

WAR DEPARTMENT, August 24, 1849.

Sir: Your letters to the Adjutant General, of the 11th and 19th June, together with copies of your military correspondence, have been received and carefully considered.

The department is gratified to learn that the desertions among your command, though they still continue, are becoming less frequent, and it encourages the hope that, by your judicious arrangements, the evil will be greatly checked, if not entirely eradicated. The disposition you propose to make of the deserters who have been convicted and sentenced by courts-martial is approved, and they can be either sent to the Atlantic posts, in our armed vessels returning from the Pacific, if arrangements to that effect can be made with the commander of the squadron, or they may be employed on the public works, either in California or Oregon.

A further increase of troops in California, under the circumstances represented in your communications, is, no doubt, desirable; but the exigencies of the service in other quarters, more particularly in Florida and Texas, have weakened the means of the department to this end, and no assurance can be now given that additional troops will be speedily sent to you, beyond what may be required to keep up the present companies to their legal establishment.

There should be a limit as to time in which the New York volunteers may avail themselves of the provisions of the instructions of this department in October, 1848. Such as may not already have signified their
determination to return home, will be precluded from doing so at the public expense.

Your application for topographical officers, and for additional medical officers, cannot be complied with. It appears, from information in the appropriate bureaus, that six topographical engineers are now in California, (three of whom are engaged upon the boundary,) and that one surgeon and seven assistant surgeons are also in that country, besides Acting Assistant Surgeon Booth, not yet discharged by you.

Your arrangements for the purpose of controlling the Indians, and preventing unauthorized interference with them, appear judicious; and it is hoped that the several positions of the troops, as indicated by you, will greatly contribute to preserve order and prevent future collisions. The department cannot too strongly urge the importance of so disposing your command as to be prepared promptly to check any efforts of this kind which may be likely to take place between the whites and Indians, as well as to prevent, as far as possible, any combination between the different tribes, for a hostile purpose.

Nor should I omit to state that the Indians are placed in a state of pupilage to the general government, by the constitution and the decisions of the Supreme Court. In my opinion, by the act of annexation the constitution was extended over the territory of California, and became the supreme law in all cases to which its provisions are applicable. Indeed, a careful examination will show, that even in a territory anomalously situated, like California, a large mass of personal and political rights is secured and protected by the constitution.

In view of the exercise of the most important political right which appertains to the people of California—that of forming a constitution and asking admission into the Union of these States—this department has watched with great care and solicitude the steps already taken to effect these objects. Regarding your proclamation of the 3d June last as a notice intended, in part, to render popular action uniform, in respect to the desired organization of California into a more perfect government, it is seen, with great satisfaction, that your propositions had been accepted with great cheerfulness and alacrity, except in a few instances, where it is supposed selfish and unpatriotic motives prevailed.

I am, very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Brevet Brig. Gen. RILEY,
Monterey, California.

Civil Affairs, 
No. 2

Executive Department of California,
Monterey, August 30, 1849.

General: I have the honor to transmit herewith copies of civil papers and letters issued by me since my despatches of June 30th, and to continue my report on the civil affairs of this country from that date.

Accompanied by Captain Halleck, Secretary of State for California, and Major Canby, Captain Westcott, and Lieutenant Derby, of my military staff, I left this place on the 5th July for the purpose of inspecting the military posts in the interior, and of learning from personal observation
the actual state of affairs in the mineral regions, and also of allaying, so far as I could, the hostile feeling which was said to exist between the Americans who were working in the gold placer. My report on the state of the troops, and a more detailed account of my tour, will be forwarded with my military papers.

Passing the mission of San Juan Bautista, we crossed the coast range of mountains near the rancho of Señor Pacheco, and struck the San Joaquin river near the mouth of the Merced, and after visiting Major Miller's camp on the Stanislaus, we proceeded to examine the principal placers on the tributaries of that river and of the Tuolumne. These washings or diggings have been among the richest and most productive in California. They are situated within a circuit of some ten or fifteen miles, and are known as "Jamestown," "Wood's Creek," "Sonorenian Camp," "Sullivan's Creek," "Curtis Creek," "Mormon Creek," "French Creek," "Carson's Creek," and "Angel's Creek." Some of these have become places of considerable importance and business, particularly the Sonorenian camp, which presents the appearance of a city of canvas houses.

Passing the Stanislaus river in the mountains, we proceeded to Major Kingsbury's camp, near the mouth of the American river, crossing in our route the Calaverat, Moquelume, Seco, and Cosumnes rivers, all of which have rich washings near their sources and their bars and islands. From Major Kingsbury's camp, we ascended the American river to Culloma Hills, where the first placer was discovered by Captain Sutter's employees in the spring of 1848. From Culloma we crossed the country to Stockton, a new town on an estero some distance above the mouth of the San Joaquin, and thence proceeded to Colonel Cazey's camp, at the straits of Carquinet; returning via San Francisco to Monterey, which place we reached on the afternoon of the 9th instant.

We found the country at this season dry and much parched by the sun, the heat of which became very great the moment we crossed the coast range of mountains. The thermometer ranged as high as 113° Fahrenheit in the shade, and above 140° Fahrenheit in the sun. A great portion of the valley of the San Joaquin is so barren as scarcely to afford subsistence for our animals; and can never be of much value for agricultural purposes. There is, however, some excellent land on the east side of that river, bordering its larger tributaries. A considerable portion of the valleys of the Moquelume, Seco, Cosumnes, and American rivers, is also well adapted to agriculture, and the broad plains lying between them furnish abundant pasture for raising stock. But the amount of good arable land, as compared with the extent of country which we passed over, is small. And I am inclined to believe that the richness and extreme fertility of certain localities have led to erroneous conclusions respecting the general character of the country. Certain it is, that while there may be found sufficient arable land to support, if well cultivated, a numerous population, there is also a very great extent of rough and mountainous country, and sandy and barren plains, which are of little value. The great difficulty to be encountered in agricultural pursuits in some portions of California, is the want of water for irrigation; but possibly this difficulty may be overcome in part, by resorting to artesian wells, if so much of the public land which is now unsaleable may be brought into market, and the settlement of the country greatly accelerated. I would, therefore, suggest whether it may not be advisable for our government to direct some experiments to
be made, at the public expense, in sinking wells of this character; for, if even unsuccessful as a means of irrigation, their construction will greatly assist in determining the geological character of the country. At present, nearly all agricultural labors are suspended in the general scramble for gold; but the enormous prices paid for fruit and vegetables in the towns will undoubtedly induce many during the coming year to turn their attention to the cultivation of the soil. The failure on the part of Congress, at its last session, to authorize the sale of public lands in California, has proven detrimental to the agricultural interests of the country. A large number of those who have emigrated to California are desirous to locate themselves permanently in the country, and to cultivate the soil; but the uncertainty which exists with respect to the validity of land titles in California, and what actually constitutes the public domain, serves as a serious check to the forming of new agricultural settlements. Moreover, speculators are purchasing up fraudulent and invalid titles to large tracts of the public domain, and selling them off in parcels, and at enormous profits, to those who have recently arrived in the country, and who are necessarily ignorant of the real state of the case. All the mission lands in California were secularized, or made government property, by a law of Mexico, dated August 17, 1833. And the territorial government of California, under the authority of the Mexican laws, leased and sold a portion of these lands and mission property. Another portion of this property, however, still remained unsold when the Americans took possession of the country, and it has since been left in the hands of the government agents for preservation. Erroneously supposing that these lands are subject to pre-emption laws, some of the recent immigrants have attempted to settle upon them. But I cannot deem myself justifiable in permitting this, for I do not conceive that lands which have been under cultivation for half a century, and now belong to government, can be subject to the pre-emption claims of private individuals in the same manner as the uncultivated lands of the public domain. It is, however, important for the interests of the country, that these mission lands be brought into market with the least possible delay; and also, that provision be made by law for the settlement and sale of the other public lands in California; and as disputes are almost daily occurring between individuals, respecting the extent of their several claims, and the validity of their titles, I would urge upon our government the necessity of immediately taking measures for the speedy and final settlement of these titles upon principles of equity and justice. This is absolutely essential for the peace and prosperity of the country. For information connected with this subject, I beg leave to call attention to the report of Captain Halleck, Secretary of State for California, which was forwarded to Washington by my predecessor, in the early part of April last.

Before leaving Monterey, I heard numerous rumors of irregularities and crimes among those working in the placers; but, on visiting the mining regions, I was agreeably surprised to learn that everything was quite the reverse from what had been represented, and that order and regularity were preserved throughout almost the entire extent of the mineral districts. In each little settlement or tented town, the miners have elected their local alcaldes and constables, whose judicial decisions and official acts are sustained by the people, and enforced with much regularity and energy. It is true, that in a few instances, certain local questions have produced temporary excitement and difficulties, but none of these have
been of a very important character, or led to serious results. Alcaldes have probably in some cases, and under peculiar circumstances, exercised judicial powers which were never conferred upon them by law, but the general result has been favorable to the preservation of order and the dispensation of justice.

The old placers are still exceedingly productive, and new ones are almost daily discovered on the smaller streams running from the western slope of the Sierra Nevada into the great valleys of the Sacramento and San Joaquin rivers. I am satisfied, however, from personal observation, that very exaggerated accounts have been sent to the United States respecting the case with which the precious metal is extracted from the earth, and that many who come to this country with the expectation of acquiring sudden wealth, with little or no labor will be sadly disappointed. It is true that the reward of labor in the mines is very high; but it should not be forgotten that gold digging and gold washing in that climate require strong constitutions and great physical exertion, and very few need expect to acquire fortunes by working the placers without severe labor and fixed habits of industry and temperance. The yield of different localities is, of course, very different—some of the placers being exceedingly rich, while the product of others is scarcely sufficient to pay the expenses of working. But I think the general average per diem for those actually employed in washing for gold will not vary much from an ounce or an ounce and a half per man. Some make much more than that sum, while those who are less fortunate fall much short of it. The actual number of persons working the placers will not vary much from ten thousand. The entire population now in the mining districts is much greater than that number; but many are engaged in mercantile pursuits, and in transporting goods and provisions, while many employ much of their time in "prospecting," or looking for nearer and richer localities.

I also found that the reports which had reached me of hostilities between Americans and foreigners in the mining districts were greatly exaggerated, and that, with a few individual exceptions, everything had remained quiet and orderly. In some of the northern placers, a party of Mexicans and Europeans, urged on by political aspirants, who seemed willing to endanger the peace of the country in order to promote their own personal interests, have assumed the authority to order all Mexicans and South Americans from that part of the territory. Their orders were quietly submitted to by the foreigners, a portion of whom removed to the mines farther south, where the American population manifested a very decided disposition to afford them protection, should they be further molested. The more intelligent and thinking portion of Americans regard this measure as illegal and injudicious, and will discountenance any repetition of movements so well calculated to disturb the public tranquillity, and to create bitter and exasperated feelings, where it is evidently our policy to cultivate those of the most friendly character. Some of the English, Irish, and German emigrants in the northern placers assisted in this movement against the Mexicans, Peruvians, and Chilians, and probably exerted themselves much more than any of our own citizens to create a prejudice and excitement against the Spanish race. They were probably actuated by pecuniary interest. The great influx of people from the southern portion of this continent was diminishing the price of labor in the towns near the northern mines, and the large number of pack ani-
mals brought from Lower California and Sonora was producing a corresponding reduction in the expenses of transportation. For example: the price of a pack mule in some parts of the mining districts, a few months ago, was about $500, whereas they can now be purchased for less than $150. The cost of transportation from the principal landing on the San Joaquin river to the Sonorenian camp was $75 per hundred, whereas at the present time it is only $7. This has reduced the price of provisions in the placers one and two hundred per cent. Some of the merchants who had large stocks of goods in the mines, and those who were engaged in transportation at the prices formerly paid, have suffered by the change, and it is natural that they should be incensed against that class of foreigners who have contributed most to effect it. But it is thought by others that the great majority of laborers and consumers in the mining districts have been benefited by this change, and that it would be injurious to the prosperity of the country to restore things to their former state by the expulsion and prohibition of foreigners from the mines. Americans, by their superior intelligence and shrewdness in business, generally contrive to turn to their own benefit the earnings of the Mexicans, Chilians, and Peruvians in this country; and any measure of exclusiveness, which is calculated to diminish the productive labor of California, would be of exceedingly doubtful policy. When applied to by the different parties for my opinion on the question of expelling foreigners, I have uniformly told them that no persons, native Americans or foreigners, have any legal right to dig gold on the public lands, but that, until the government of the United States should act in the matter, they would not be molested in their pursuits; that I could not countenance any class of men in their attempt to monopolize the working of the mines; and that all questions touching the temporary rights of individuals to work in particular localities, of which they were in actual possession, should be left to the decision of the local judicial authorities.

I cannot close my remarks on this subject without again calling the attention of government to the importance of establishing a mint in California at the earliest possible moment. This measure is called for by every consideration of national policy and justice to the mercantile and mining population of California.

General Kearny, during his administration of affairs in this country, appointed, by virtue of his authority as governor of California, two sub-Indian agents, who have ever since been continued in office, and their services found of great utility in preserving harmony among the wild tribes, and in regulating their intercourse with the whites. They have been paid, from the "civil fund," very moderate salaries, which will be continued until the arrival of agents regularly appointed by the general government. Notwithstanding every effort on the part of these agents, and of the officers of the army here, it has not been possible at all times to prevent aggressions on the part of the whites, or to restrain the Indians from avenging these injuries in their own way. In the month of April last, the agent in the Sacramentito valley reported that a party of Oregónians and mountaineers had committed most horrible barbarities on the defenceless Indians in that vicinity. These cruel and inhuman proceedings, added, perhaps, to the execution of a number of chiefs, some year and a half since, by a military force sent into the San Joaquin valley by my predecessor, (the details of which were reported to Washington at the
time,) have necessarily produced a hostile feeling on the part of the natives; and several small parties of whites, who, in their pursuit of gold, ventured too far into the Indian country, have been killed. My correspondence with the Indian agents and military officers stationed in the Sacramento and San Joaquin valleys will inform you of the measures taken to prevent a repetition of these difficulties. I would respectfully recommend that at least three sub-Indian agents be appointed for this country, and stationed in the valleys of the Sacramento and San Joaquin. These agents should receive ample pay, in order to enable them to defray the expenses of living in that part of the country, and should be men of the highest moral character, for otherwise they will not resist the temptation to engage in illicit trade with the natives, or to employ them for the individual benefit of the agents in washing for gold.

The election called by me for the 1st instant was held on that day, and has been attended with the most happy results. Every district has elected its local officers, and appointed delegates to meet in general convention at this place on the 1st proximo to form a State constitution or plan of Territorial government, which will be submitted to the people for their ratification, and transmitted to Washington for the action of Congress. Most of the local and judicial officers named in my proclamation of the 3d of June have already entered upon their duties, and the interest which was taken by the people in every part of the country in this election, and the zeal manifested by those elected and appointed to office, afford strong hopes that the existing government will be able to preserve order and secure the administration of justice until a new one shall be put into regular and successful operation.

In my former despatch I mentioned that the civil officers of the existing government would be paid their regular salaries from the civil fund, which had been formed, under the direction of the governor of California, mainly out of the proceeds of the temporary custom-houses established by my predecessor on this coast. It will also be necessary to use a portion of this fund in the immediate construction of jails for the security of civil prisoners. The want of such jails has already led to the most serious inconveniences. Prisoners have so frequently effected their escape, that on several occasions the people have arisen in mass, and executed criminals immediately after trial, and without waiting for the due fulfilment of all the requisitions of the law. In many cases it has been found necessary to confine civil prisoners on board vessels of war and in the guardhouses of the garrisons; but in the towns at a distance from the coast and the military posts the difficulty of retaining prisoners in custody has led, in some instances, to immediate and summary executions. This evil calls for an immediate remedy, which will be afforded so far as the means at my disposal will admit.

I beg leave, in this place, to add a few remarks on the use which has been, and will continue to be, made of this "civil fund." In the instructions from Washington to General Kearny, in 1846, for his guidance in California, the establishment of port regulations on this coast was assigned to the commander of the Pacific squadron, while it was said "the appointment of temporary collectors at the several ports appertains to the civil governor of the province." It was also directed that the duties of the custom-houses be used for the support of the necessary officers of the civil government. This division of duties, and this disposition of the
proceeds of the customs, was continued during the whole war. On the receipt of the Treasury Department regulations respecting the collection of military contributions in Mexico, officers of the army and navy were made collectors at some of the ports, but at others the civil collectors appointed by the governor of California were retained. At the close of the war Governor Mason, for reasons already communicated, determined to continue the collection of revenue in this country, on the authority which had provisionally been given to him, until Congress should act in the matter, or orders to the contrary be received from Washington. He therefore, as governor of California, again appointed civil collectors in the ports where military officers had temporarily performed those duties, and collected the customs on all foreign goods, in accordance with the provisions of the tariff of 1846, while the commander of the Pacific squadron continued the direction of all matters relating to port regulations. A double necessity impelled the governor to this course. The country was in pressing need of these foreign goods, and Congress had established no port of entry on this coast. The want of a more complete organization of the existing civil government was daily increasing, and as Congress had made no provisions for supporting a government in this country, it was absolutely necessary to create a fund for that purpose from the duties collected on these foreign goods. It is true that there was no law authorizing the collection of these duties, but at the same time the laws forbade the landing of the goods till the duties were paid. Governor Mason, therefore, had no alternative but to pursue the course which he adopted. He immediately communicated to Washington his action in the case, and as the receipt of his despatch was acknowledged without any dissent being expressed, it must be presumed that his course met with the approbation of the government. When I assumed command in this country as civil governor, I was directed to receive these communications and instructions from Governor Mason for my guidance in the administration of the civil affairs of this Territory. I have accordingly continued the collection of the revenue, and added the proceeds to the "civil fund," using that fund for the necessary expenses of the civil government. The expenses of employing civil officers in this country are very great, and as I have no authority to levy taxes, this fund forms my only means of carrying on the government. The necessity of employing these officers, and of paying them the full salaries authorized by law, under the existing state of affairs, is too obvious to require comment. I have pledged myself to pay these salaries from the civil fund, unless forbidden to do so by direct orders from Washington; and that pledge will be fulfilled. This civil fund was commenced in the early part of 1847, and has been formed and used in the manner pointed out in the early instructions to the governor of this Territory. This money has been collected and disbursed by the "governor of California," and by those appointed by him in virtue of his office. He is therefore the person responsible for this money both to the government and to the parties from whom it is collected, and it can be expended only on his orders. None of the military departments of the army, nor any army officer, simply in virtue of his commission, can have any control, direct or indirect, over it. It is true that some of this money has, from time to time, as the wants of service required, been transferred to the different military departments; but this transfer was in the form of a loan, and the money so transferred will be returned to the
civil fund as soon as arrangements can be made for that purpose. The increased expenditures for the support of the existing government will soon render this restoration absolutely necessary, especially as the transfer of the custom-houses to the regular collectors appointed by the general government will now cut off all further means of supplying the civil treasury. These collectors have not yet arrived, but are daily expected.

Detailed accounts of the expenditure of this civil fund, with the accompanying vouchers, will be transmitted to Washington as heretofore.

Very respectfully, your obedient servant,

B. RILEY,
Brevet Brigadier General U. S. A.,
and Governor of California.

Major General R. JONES,
Adjutant General of the Army,
Washington, D. C.

[No. 4.] HEADQUARTERS TENTH MILITARY DEPARTMENT,
Monterey, California, August 30, 1849.

COLONEL: I found upon my arrival at this place, from a reconnaissance of a portion of the valleys of the Sacramento and San Joaquin rivers, General Orders No. 1, from the headquarters of the army; and as I cannot have copied, in season for transmission by the steamer of the first proximo, the military correspondence from these headquarters, I respectfully submit for the information of the commander-in-chief a brief summary of the reports heretofore made in relation to military affairs in this department.

My attention was directed, upon my arrival in this country, to the unparalleled excitement in relation to the mineral regions; the imminent danger that our troops, as they arrived, would desert to the placers, and instead of giving protection to the frontiers, and aiding in the preservation of order and tranquillity, would themselves become the very worst elements of disorder; the great extent of frontiers to be guarded, and the difficulties then apprehended from the unsettled state of affairs in the gold districts. An attentive consideration of these subjects impressed me with the opinion that the policy most likely to prove advantageous to the service, would be the concentration of all the troops in the department, except the necessary guards for the depots, at one or two points in the immediate vicinity of the mining districts, from whence a portion of them might be permitted to visit the placers for the purpose of working for their own benefit. The remainder to be held embodied, in a proper state of discipline, in readiness to meet any emergency that might occur. Upon the expiration of the furloughs of the first class, a second to be furloughed; and so, in succession, with the remainder. The troops stationed at points so remote that they could not be furloughed, to be relieved by commands that had been more favorably situated. The practice of granting furloughs adopted at some of the posts in this department, with the sanction of the former department commanders, had succeeded well, and information received from the South, about the time of my arrival, confirmed me in the opinion, previously entertained, that the mania for gold hunting would exist in its most exaggerated form at points the most remote from the
placers, for experience in the hardships of gold digging speedily dispels many of its illusions. I accordingly recommended, immediately after relieving Colonel Mason in the command of this department, the adoption of the policy above indicated.

It is a matter of great regret, that the emergencies of the service have been such, that this policy could not be carried out to the extent recommended, for the experience of the past four months has satisfied me that it is the only course that can be adopted here, with any reasonable hope of success, until the situation of affairs in this country is materially changed.

In addition to the question of mere expediency, Indian difficulties that were then occurring upon the American fork of the Sacramento, and the threatening danger of a collision between the different classes in the mineral region, rendered it highly important that a strong military force should be established in that immediate vicinity.

For the disposition of the troops in the department, and the measures taken to prevent desertions, preserve discipline, &c., I respectfully refer to the department’s orders and special orders, complete files of which, from the date of your General Order No. 1, will be forwarded by the next steamer. These furnish you with a history of the operations in the department since that time. The present disposition of the troops is the same as indicated in Department Order No. 16, except that company A 2d infantry, reinforced by details from other companies, in all four officers and eighty men, have been detached under instructions from the commander of the division (Department Special Order No. 29;) and company E 1st dragoons, when en route for its station, was diverted from its original route for the purpose of securing the perpetrators of some Indian murders that had been committed on Los Reyes river.

The difficulties apprehended from a collision between the different classes of mining population have not yet occurred in the form which it was feared they would assume; and, at present, I do not apprehend any serious difficulty from that source. Some serious Indian disturbances have occurred on the American Fork, and a few isolated murders have occurred at other points. The Indians of the Sierra Nevada, although in great numbers, are of a very degraded class, and are divided into so many different tribes, or rancherias, speaking different languages, that any combination on their part is scarcely to be apprehended. Their depredations heretofore have generally been confined to horse stealing, and only occasionally have murders been committed by them. These, however, have been made the pretence, by the whites in their neighborhood, for the commission of outrages of the most aggravated character, involving, in one or two cases, in an indiscriminate massacre the wild Indians of the Sierra and the tame Indians of the ranchos.

The commanders of detachments on the Indian frontier are instructed to prevent any unauthorized interference with the Indians by the whites, and to support the Indian agents in the performance of their appropriate duties. From the character of a portion of the mining population, and the nature of their pursuits, unless a strong military force be maintained on that frontier, it will be impossible to prevent the commission of outrages upon the Indians, and these in turn will be avenged by murders committed upon isolated parties of whites. Unfortunately, the eagerness with which gold is sought after by detached parties of miners, gives many oppor-
tunities for the commission of such outrages. To seek after and apprehend the perpetrators in cases of this kind, a mounted force is absolutely necessary; and although great difficulty will be experienced in obtaining forage and replacing horses that may be disabled or lost, its services are so indispensable, that I greatly regret my inability to supply more than one company for the Indian frontier until after the company now on duty with the commissioners of the boundary survey is relieved.

I have heretofore called the attention of the War Department, and the commander of the division, to the insufficiency of the force assigned to this department by General Orders No. 49, of 1848. As it may not be possible to order any additional force to this country without the action of Congress, I respectfully invite the attention of the commanding general to the views heretofore expressed upon this subject. A map of this department is herewith transmitted, upon which I have indicated the positions or neighborhoods in which I deem it important that troops should be stationed. The amount and character of the force required is expressed in my report to division headquarters of June 11, which is also enclosed.

The embarrassments under which the service has labored in this department will be so readily appreciated at home, that it is unnecessary to refer to them here, except to say that, perplexing as these have been, they have been greatly increased by the want of line and staff officers. In consequence of the extraordinary prices of labor and the consequent enormous expenditures in this country, young officers of the line, in justice to the service and to themselves, should not be, as they necessarily have been, encumbered with money and property responsibility to very great amounts.

Experienced officers of the Quartermaster's department are required at San Francisco, San Diego, and with the commands on the Upper Sacramento and the San Joaquin rivers. I have but one officer (Captain Kane) of that department under my control, and he is necessarily retained at department headquarters in the preparation of my estimates for the service of the ensuing year. Quarters must soon be erected at several posts in this department, and I cannot spare line officers for that duty without destroying their efficiency with their companies even if it were proper to do so.

There are no topographical engineers on duty in the department; and, in consequence of the want of them, I have been able to accomplish very little of the duty devolved upon me by the third paragraph of General Orders No. 49, 1848. A reconnaissance of a portion of the valleys of the Sacramento and San Joaquin, undertaken for the purpose of determining the positions to be occupied, as recommended in my report to division headquarters of April, and to the War Department of the 25th of the same month, has strengthened my conviction of the importance of giving this country a most thorough examination before any military posts are located in the interior. The whole district of country lying between the coast range and the Sierra Nevada is exceedingly sickly at certain seasons of the year. The common timber of the country (oak) is unfit for building purposes; and I was greatly disappointed in finding that south of the Sacramento river, pine fit for lumber exists only on the spurs of the mountains, in small quantities, and in places difficult of access. Stone, as a building material, is scarce; and, at many of the points where it may be desirable
to establish military posts, grain for forage is out of the question, and grass can be found only in exceedingly limited quantities.

I expressed a hope, in my despatch of June 20, that I would be able to make an examination of the country along the western slope of the Sierra Nevada before the commencement of the winter; but the season is now so far advanced that I shall not be able to do more than determine a position to be occupied in the neighborhood of Los Reyes river. It is of great importance that this position should be determined as soon as possible; for new discoveries of gold are constantly being made in that direction, attracting thither a large portion of the mining population. The increasing population of the northern placers is gradually forcing the Indians to the south, and congregating them about the waters of the lake Buena Vista, into which the Reyes river empties. If possible this position should be occupied before the miners have become established in that neighborhood; and the necessary examinations and arrangements will be made as soon as it is possible to do so.

Since my application of April 25 for officers of the Quartermaster’s department, two officers of that corps, (Major Allen and Major Fitzgerald,) who I had supposed would be available for duty in this department, have been permanently separated from it; and the number then applied for should be increased by two. Two of the medical officers in this department are now prostrated by disease; and, as their places cannot be supplied here, there should be in this department at least three medical officers more than are actually required for duty at the different posts, to meet emergencies of this kind.

The ordnance depots at this place and San Francisco are under the charge of military storekeepers; but it is important, in order that this property should be preserved in a serviceable condition, that they should be under the supervision of an experienced ordnance officer.

With the exception of the assistant quartermasters above referred to, all of the officers enumerated have heretofore been applied for; but as none have yet, so far as I have heard, been ordered, I will state in detail what officers are required with this command, viz:

Four officers of the quartermaster’s department, in addition to Captain Kane, now on duty here;
Two topographical engineers;
Three additional medical officers;
One officer of the subsistence department;
One officer of the ordnance department.

The irregular communication with some of the interior posts creates a good deal of embarrassment, by delaying my reports of returns. In consequence of this, I am not able to render a later return than for June. The transport Mary and Adeline, with companies A and F, 2d infantry, reached San Francisco on the 8th of July. The detachments of dragoons, on their march to this department as the escort of the collector of the district, and with the Arkansas emigrants, have not yet arrived.

During the months of July and August, so far as reports have been received, there were but few desertions, except from the company detailed for the escort of Captain Warner, topographical engineers; thirty-four men, more than half the whole number reported, deserted from this company. The whole force now in the department probably does not exceed six hundred and fifty, (aggregate,) consequently, more than four hundred
recruits are required to fill up the companies to the standard authorized for this department.

A detailed report of my reconnoissances of the valleys of the San Joaquin and Sacramento will be forwarded by the next steamer. It has been delayed in order to imbibe in it information in regard to the Tulareas, which I am in the daily expectation of receiving.

The want of company officers is greatly felt; and I request that authority may be given me to break up companies whose captains are permanently absent, transferring the officers to other companies as their services may be needed.

I have the honor to be, very respectfully, Colonel, your obedient servant,

B. RILEY, Brevet Brigadier General, U. S. A.,
commanding 10th Military Department.

Headquarters of the Army, New York.

CIVIL AFFAIRS,
No. 3.

EXECUTIVE DEPARTMENT OF CALIFORNIA,

Monday, October 1, 1849.

GENERAL: Enclosed herewith are copies of all civil papers issued since the date of my last civil despatch.

The convention called by my proclamation of June 3d assembled at this place on the 1st ultimo, and has nearly completed its labors in forming a constitution to be submitted to the people for their ratification. It has been determined by the unanimous vote of this convention, (at least, so I am informed,) that the new government organized under this constitution, should it be ratified by the people, shall go into operation as soon as may be convenient after such ratification, and without waiting for the approval of Congress, and the admission of California into the Union. I have strong doubts of the legality of such a measure under the decision of the Supreme Court of the United States; but if it should be the wish of the people of California to put the new government into operation without waiting the action of Congress, I shall deem it my duty, under the circumstances, to surrender my civil powers into the hands of the new executive, unless special orders to the contrary are received from Washington.

In my civil despatch of August 30, I explained the character of the "civil funds" now in my hands, and the use which would be made of them in defraying the expenses of the existing government, and I now ask for instructions as to the disposition to be made of such portions of these funds as may be left when this government shall be superseded by that organized under the constitution now forming by this convention. Many have expressed the opinion that these funds shall be turned over to the new government in order to enable it to go immediately into successful operation. However strongly of the opinion that this money belongs, in justice, to the people of California, I nevertheless shall not deem myself authorized to turn over this money until instructed to do so by direct orders from Washington. I hope that the views of government touching this matter may be sent me without delay.

I send herewith a copy of a report of Brevet Captain Westcott, respect-
ing the missions of San Jose and Santa Clara. The temporary arrangements made by me for the care and management of this property will be seen in the copies of civil papers transmitted with this despatch.

Very respectfully, your obedient servant,

B. RILEY,
Brevet Brig. Gen., U. S. A., commanding the Department, and acting Governor of California.

Major General R. Jones,
Adjutant General, Washington, D. C.

WAR DEPARTMENT, WASHINGTON,
November 28, 1849.

Sir: The Adjutant General has submitted to this department your letter of October 1, on the subject of the civil affairs of California, in which you propose, should it be the wish of the people to put the new government into operation without waiting the action of Congress, to surrender your civil powers into the hands of the new executive of that Territory, unless specially ordered to the contrary. As the arrangement contemplated by you may already have been made, any instructions from this department contrary to your views on the subject might militate against the peace and quiet of the community and be productive of evil. The first consideration is, a due observance of law and order, and this, it is hoped and believed, will be attained under the new state of things. It is not doubted that Congress will either recognize the constitution which it is supposed the people of California have formed, and probably adopted, or provide a Territorial government for them. In either event, the officers of the army will be relieved of the necessity of participating in civil matters, so inconsistent with their appropriate public duties, and under circumstances so embarrassing by the absence of legislative authority, to guide and control.

In respect to the disposition to be made of the civil funds in your hands derived from collections, a part of which has been used in defraying the expenses of the government, whatever opinions may be entertained as to the propriety of their transfer to the executive authority of the Territory, it is deemed proper, as these funds were collected through the agency of the general government, that they should be held subject to the final action of Congress. To that end, therefore, you will cause them to be placed in the safe-keeping of the proper officers of the Treasury Department, and submit to this department an account, with vouchers, of such disbursement as may have been made by you from the funds collected.

Very respectfully, your obedient servant,

GEO. W. CRAWFORD,
Secretary of War.

Brevet Brigadier General B. RILEY,
Commanding Eleventh Department, Monterey, California.
No. 7.

REPORT OF THE ADJUTANT GENERAL.

WAR DEPARTMENT, ADJUTANT GENERAL’S OFFICE,
Washington, November 28, 1849.

SIR: Pursuant to your instructions of September 5, I respectfully submit the following annual report, together with the usual returns of the army, viz:

1. Organization of the army of the United States as established by law, A.
2. General return of the army, B.
3. Position and distribution of the troops in the eastern division, C.
4. Position and distribution of the troops in the western division, D.
5. Position and distribution of the troops in the Pacific division, E.
6. Return of the troops employed in suppressing Indian hostilities in Florida, F.
7. Exhibit of the number of recruits enlisted from October 1, 1848, to September 30, 1849, G.

The authorized military establishment consists of 870 commissioned officers, and 8,940 non-commissioned officers, musicians, artificers, and privates, and is constituted as follows:

<table>
<thead>
<tr>
<th>Designation of regiments and corps</th>
<th>Commissioned officers</th>
<th>Non-commissioned officers, musicians, artificers</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>General officers</td>
<td>3</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Adjudant General's department</td>
<td>14</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Inspector General's department</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Judge Advocate of the army</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>General staff</td>
<td>43</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Quartermaster's department</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Commissary General's department</td>
<td>8</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Medical department</td>
<td>95</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>Pay department</td>
<td>28</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>Corps of engineers</td>
<td>43</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Corps of topographical engineers</td>
<td>36</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Ordnance department</td>
<td>37</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Military storekeepers</td>
<td>17</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>310</td>
<td></td>
<td>327</td>
</tr>
</tbody>
</table>

Two regiments of dragoons......70 1,230 1,300
One regiment of mounted riflemen......35 765 800
Four regiments of artillery......208 2,600 2,808
Eight regiments of infantry......272 4,192 4,464

585 8,787 9,372
One company of engineer soldiers (sappers, miners, and pontoniers)......100 100
Ordnance sergeants......53 53

Aggregate of the authorized military establishment......895 8,940 9,835

*The actual number of commissioned officers is 870; 25 hold commissions both in the staff and line, are counted twice, and should be deducted from the number 895, obtained by adding the full number allowed to each regiment and corps. This number (895) does not include the military storekeepers (17); but these are accounted for in the column of "aggregate."
It will be seen that the authorized force (troops of the line) consists of
2,100 cavalry, officers and men; 2,808 artillery, of which eight compa-
nies are organized as light artillery, and 4,464 infantry, making in the
aggregate 9,372.

The latest returns show 9,003 men in service, including recruits and
men unassigned, being 216 more than authorized; but returns from dis-
tant regiments not being later than July and August, it is estimated that
there is a deficiency of 500. The reported strength of all the regiments
is 7,974, or 513 less than the establishment.

The number of enlisted men of the Ordnance department in service,
according to the last returns, is 535. The number is not restricted by
law.

II. The number of major generals having been reduced as contem-
plated by the act approved July 19, 1848, to one, Major General Scott,
general-in-chief, in accordance with the President’s instructions, resumed
command of the army on the 11th of May, 1849, and established his
headquarters at the city of New York.

The number of brigadier generals having in like manner been reduced
to two, Brigadier Generals Wool and Twiggs (major generals by brevet)
have been assigned to the command, respectively, of the eastern and
western geographical divisions.

III. The following is the permanent distribution of the regiments and
corps constituting the army:

**EASTERN DIVISION.**

**DEPARTMENT NO. 1.**

Ten companies of the third regiment of artillery.

- Fort Sullivan, Eastport, Maine ........................................ 1 company.
- Fort Preble, Portland, Maine ........................................ 1 company.
- Fort Constitution, Portsmouth, New Hampshire ...................... 1 company.
- Fort Warren .................................................. Boston, Massachusetts—works incomplete. *3 companies.
- Fort Independence .................................................. 13 companies.
- Fort Adams ........................................ Newport, Rhode Island .................. 1 company.
- Fort Trumbull, New London, Connecticut ........................... 1 company.

**DEPARTMENT NO. 2.**

Six companies of the fourth regiment of infantry.

- Fort Mackinac .................. do ........................................ 1 company.
- Fort Gratiot .................. do ........................................ 1 company.
- Detroit .............................................................. 1 company.
- Fort Howard, Green Bay, Wisconsin ................................. 2 companies.

**DEPARTMENT NO. 3.**

Four companies of the fourth regiment of infantry.

- Fort Niagara .................. New York .................................. 1 company.
- Fort Ontario, Oswego, do ........................................ 1 company.
- Madison Barracks, Sackett’s Harbor, do .......................... 1 company.
- Plattsburg Barracks, do .................................... 1 company.

*The forts in Boston harbor not being completed, the companies intended for their garrison
have been quartered at Fort Adams until September 22, 1849, when they were withdrawn for
temporary duty in Florida.

†Two of these companies were withdrawn for temporary duty in Florida, September 22, 1849.
Nine companies of the first regiment of artillery and one of the second.

<table>
<thead>
<tr>
<th>Location</th>
<th>Company Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Columbus, New York harbor</td>
<td>3 companies</td>
<td></td>
</tr>
<tr>
<td>Fort Hamilton,</td>
<td>2 companies</td>
<td></td>
</tr>
<tr>
<td>Fort Lafayette,</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Mifflin, Pennsylvania</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort McHenry, Maryland</td>
<td>1 light company, 24th regiment</td>
<td></td>
</tr>
<tr>
<td>Fort Washington,</td>
<td>12 companies</td>
<td></td>
</tr>
</tbody>
</table>

DEPARTMENT NO. 4.

Nine companies of the second regiment of artillery.

<table>
<thead>
<tr>
<th>Location</th>
<th>Company Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Monroe, Virginia</td>
<td>2 companies</td>
<td></td>
</tr>
<tr>
<td>Fort Johnston</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Caswell</td>
<td>2 companies</td>
<td></td>
</tr>
<tr>
<td>Fort Macon, Beaufort, North Carolina</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Moultrie</td>
<td>12 companies</td>
<td></td>
</tr>
<tr>
<td>Castle Pinkney</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Augusta Arsenal, Georgia</td>
<td>11 company</td>
<td></td>
</tr>
<tr>
<td>Oglethorpe barracks, Savannah, Georgia</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Marion, St. Augustine, Florida</td>
<td>1 company</td>
<td></td>
</tr>
</tbody>
</table>

WESTERN DIVISION.

DEPARTMENT NO. 5.

Nine companies of the fourth regiment of artillery.

<table>
<thead>
<tr>
<th>Location</th>
<th>Company Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Brooke, Tampa Bay, Florida</td>
<td>2 companies</td>
<td></td>
</tr>
<tr>
<td>Key West</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Key West</td>
<td>51 companies</td>
<td></td>
</tr>
<tr>
<td>Fort Pickens</td>
<td>2 companies</td>
<td></td>
</tr>
<tr>
<td>Fort McRea</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Morgan, Mobile Point, Alabama, Works incomplete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fort Pike, Louisiana</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Fort Wood</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>New Orleans barracks</td>
<td>1 company</td>
<td></td>
</tr>
<tr>
<td>Baton Rouge barracks</td>
<td>1 company</td>
<td></td>
</tr>
</tbody>
</table>

DEPARTMENT NO. 6.

The sixth and seventh regiments of infantry, five companies first dragoons, two companies mounted rifles, one light artillery company of the third, and one light artillery company of the fourth regiment.

<table>
<thead>
<tr>
<th>Location</th>
<th>Company Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Gaines, Minnesota Territory</td>
<td>1 company first dragoons, 1 company sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Snelling</td>
<td>3 companies sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Laramie, Oregon route</td>
<td>2 companies mounted rifles, 1 company sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Kearny,</td>
<td>1 company first dragoons, 2 companies sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Lavenworth, Missouri</td>
<td>2 companies first dragoons, 2 companies sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Scott, Missouri Territory</td>
<td>1 company first dragoons, 1 company sixth infantry</td>
<td></td>
</tr>
<tr>
<td>Jefferson Barracks, Missouri</td>
<td>1 company third artillery, 1 company fourth artillery, 1 seventh regiment of infantry</td>
<td></td>
</tr>
</tbody>
</table>

DEPARTMENT NO. 7—ARKANSAS AND INDIAN COUNTRIES.

The fifth regiment of infantry and two companies of the first dragoons.

<table>
<thead>
<tr>
<th>Location</th>
<th>Company Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Gibson, Cherokee country</td>
<td>11 companies first dragoons, 4 companies fifth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Smith</td>
<td>2 companies fifth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Washita, Chickasaw country</td>
<td>11 companies first dragoons, 2 companies fifth infantry</td>
<td></td>
</tr>
<tr>
<td>Fort Towson</td>
<td>2 companies fifth infantry</td>
<td></td>
</tr>
</tbody>
</table>

*Three of these companies withdrawn for temporary duty in Florida in September, 1849.
†One of these companies withdrawn for temporary duty in Florida September 26, 1849.
‡Withdrawn for temporary duty in the Indian country, Florida, in September, 1849.
§Withdrawn for temporary service in the Indian country October 22, 1849.
∥One of the companies not yet withdrawn from service in New Mexico.
¶Absent—not yet withdrawn from New Mexico.
DEPARTMENT NO. 8—TEXAS.

The first and eighth regiments of infantry, six companies second dragoons, and two companies fourth artillery—(one light artillery.)

1. Fort Polk, Point Isabel .............................................. 1 company fourth artillery.
   Fort Brown, Rio Grande, opposite Matamoras .................... 3 companies first infantry.
   Ringgold Barracks, Davis's Landing, Rio Grande, 1 light company, fourth artillery; 1 company first infantry.
   Laredo, Rio Grande ................................................. 2 companies first infantry.
   Eagle Pass, near Presidio, Rio Grande ............................ 4 companies first infantry.
   Leon, ............................................................. 1 company second dragoons; 1 comp'y eighth infantry.
   Rio Seco, ..................................................................... 1 company second dragoons; 1 comp'y eighth infantry.
   Fredericksburg, ......................................................... 2 companies eighth infantry.
   Hamilton creek, ......................................................... 1 company second dragoons; 1 comp'y eighth infantry.
   Leon river, ............................................................. 2 companies eighth infantry.
   Fort Graham, Jose Maria village, ................................. 1 company second dragoons; 1 comp'y eighth infantry.
   West fork of Trinity river, ......................................... 1 company second dragoons; 1 comp'y eighth infantry.

DEPARTMENT NO. 9—NEW MEXICO.

The third regiment of infantry, four companies second dragoons, and two companies second artillery.

1. Santa Fe, near the Upper Rio Grande ............................ 1 company second artillery.
   Don Fernando de Taos ............................................. 2 companies second dragoons.
  Albuquerque .............................................................. 1 company second dragoons.
   Doña Anna ............................................................ 1 company second dragoons.
   Socorro ................................................................. Detachment of company second dragoons.
   El Paso del Norte .................................................. 6 companies third infantry.
   Posts to be established ........................................... 1 company second art'y; 4 companies third infantry.

PACIFIC DIVISION.

DEPARTMENT NO. 10—CALIFORNIA.

The second regiment of infantry, three companies first dragoons, one company first artillery, and two companies third artillery.

1. Sonoma ................................................................. 1 company first dragoons.
   Presidio of San Francisco .......................................... 1 company third artillery.
   Benicia, bay of San Francisco ..................................... 2 companies second infantry.
   Camp Stanislaus, 25 miles from Stockton, on the San Joaquin, 1 company first dragoons; three companies second infantry.
   Post 30 miles from Sutter's fort, on the Sacramento .......... 2 companies second infantry.
   Monterey Redoubt .................................................... 1 company third artillery.
   San Diego .............................................................. 2 companies second infantry.
   Escort to boundary survey, *1 company first dragoons; 1 company second infantry.
   En route for service in Department No. 10, 1 light company, first artillery.

DEPARTMENT NO. II.—OREGON.

Two companies first artillery and eight companies regiment mounted riflemen.

1. Tusqually, Puget's sound ........................................ 1 company 1st artillery.
   Fort Vancouver, Columbia river ................................ 1 company 1st artillery.
   New post near Fort Hall, Oregon route ....................... 2 companies mounted riflemen.
   En route for Oregon ................................................ 6 companies mounted riflemen.

IV. The occupancy of Forts Crawford and Atkinson, on the Upper Mississippi, having become unnecessary since the emigration west of the Winnebago Indians, these posts have been abandoned, and the garrisons distributed to other stations within the 6th department, and on the Oregon route. *Fort Gaines, the new post opposite the mouth of the Nokay, (400 miles above Fort Crawford,) was occupied on the 13th April, and the in-

*The company of dragoons will be stationed at the post near Sutter's fort, and the infantry company at San Diego, when relieved from duty as escort to the boundary survey.
fantry company of the garrison has since been employed in erecting the necessary buildings. The dragoon company has been employed, with an officer of topographical engineers, in examining the country on the Red river of the North, in order to determine the expediency of establishing another military post near the boundary line of the United States and the British possessions. The expedition was commanded by Brevet Major Woods, 6th infantry.

On the recommendation of the Commissioner of Indian Affairs, Fort Howard, Green Bay, abandoned in 1841, was re-occupied (September 14) by a field officer and two companies of the 4th infantry, drawn from Madison barracks and Detroit. The measure, deemed necessary to preserve harmony between the whites and Menomonee Indians in that quarter, may be regarded only as a temporary arrangement.

Under instructions from the War Department, a detachment of dragoons and infantry left Fort Smith, the 5th April, for the protection of a party of emigrants to California, by the valley of the Canadian river and Santa Fe. An officer of topographical engineers accompanied the party, with directions to examine and report upon the facilities of the route, with a view to the opening of a new avenue to the Pacific. The party reached Santa Fe on the 28th of June, when a small escort was detailed to accompany the emigrants to California.

V. Florida.—Intelligence was received (July 25) of the depredations committed on Indian river by the Florida Indians, when several companies of artillery, acting as infantry, were ordered to be held in readiness for the field. Further reports of hostile acts at Pease creek having been received, eight companies, (in addition to the one at St. Augustine, two at Tampa Bay, and one at Key West,) and the 7th regiment of infantry from Jefferson barracks, were ordered between the 28th July and 6th of August to Florida, and Brevet Major General Twiggs specially assigned to the command. Orders were issued the 12th September for the augmentation of this force by ten companies which were withdrawn from the Atlantic stations.

VI. Texas—(Department No. 8.)—After a careful examination of the country, the troops originally assigned to this department in "General Orders" No. 49, of August 31, 1848, have been so posted as best to restrain the marauding bands of Indians who have hitherto continually annoyed the settlers. The posts on the Indian frontiers are generally beyond the settlements, and are so located as to afford the means either of combined or independent movements. The commander of the department has authority to mount, when necessary, a portion of the infantry force, which has enabled him, with a proper distribution of the regular cavalry, to concentrate six mounted companies at any point on short notice, leaving a small infantry force to guard the posts. The positions at Eagle Pass, near the high road from San Antonio to Chihuahua, crossing the Rio Grande at the Presidio Rio Grande, and Fort Brown, opposite Matamoras, have larger garrisons than either of the frontier posts, because, being the keys to the upper provinces of Mexico, they must necessarily have a strong influence in maintaining peaceful relations along the boundary line, and in protecting the revenue laws. 1,205 officers and men (regular army) are stationed within Texas, and at this time occupy thirteen posts.

VII. New Mexico—(Department No. 9.)—The troops assigned to this
department in "General Orders" No. 49, of 1848, have all reached their
destination. Six companies 3d infantry, under Brevet Major Van Horn,
marched from San Antonio June 1st, and reached El Paso September 8th,
having been 100 days en route. The distance between the two points is
reported to be 650 miles. The troops encountered many difficulties in
opening the road, but were in good health, and well provided with neces­
sary supplies. The other battalion of four companies 3d infantry, with two
companies 2d artillery, commanded by Brevet Lieutenant Colonel Alex­
ander, marched from Fort Leavenworth May 16th, and arrived at Santa
Fe July 23d. A company of the 2d dragoons marched from Fort Leaven­
worth May 17th, and arrived at Santa Fe July 11th. The two compa­
nies of the 2d dragoons, which for the convenience of the service were
broken up and transferred in California, were re-organized in June at the
Carlisle depot, and put en route for New Mexico, their destination, early
in August. The three companies of the 1st dragoons and light battery
of the 3d artillery serving in New Mexico, since the peace, have been
relieved by these companies, and are now, it is believed, in march for
their proper stations in departments Nos. 6 and 7.

In addition to the regular troops employed in New Mexico, (before the
arrival of the reinforcements,) four companies of militia, two of them
mounted, were called into service for six months, in March and April, by
Brevet Lieutenant Colonel Washington, the commander of the depart­
ment. He reports that their services have contributed towards the com­
parative quiet and security at present enjoyed in New Mexico. A com­
pany of sixty-three Mexican, and one of fifty-four Pueblo Indian volun­
teers, were also received into service and employed in a campaign against
the Navajo Indians from the 22d August to the 22d September. The
commander of the department reports that the emergency at the time re­
quired the employment of this auxiliary force.

In consequence of depredations and murders committed by the Navajo
Indians, an expedition consisting of two companies 2d artillery, (85 men,)
with four companies 3d infantry, (123 men,) one mounted company of
territorial militia, (63 men,) and one of Pueblo Indians, (54 men,) in all
325 troops, under that energetic officer Brevet Lieutenant Colonel Wash­
ington, marched from Jemes on the 22d August, for the cañon of Cheille.
After a march of eight days, the command arrived in the vicinity of the Indian cornfields at Tunacha. A
party of the Indians was here fired upon, and several killed and wounded;
among the former the head chief Narbona. The number of this tribe
is estimated at 7,000 to 10,000, of whom between 2,000 and 3,000
are warriors. They are generally well mounted, and well armed with
guns, lances, bows and arrows. The object of the expedition having
been accomplished, Colonel Washington returned by another route, and
after a march of about 550 miles, reached Albuquerque the 21st September.

Several skirmishes with the Eutaws and Apaches have also been re­
ported, in which the troops evinced their wonted skill and bravery.
The advantages resulting from these several affairs are, the recovery of
several captives and much stolen property, a knowledge of the haunts of
the savages, and the moral effect, already apparent, on finding themselves
always promptly pursued and obliged to yield the fruit of their forays.

In New Mexico, eight hundred and eighty-five troops are stationed and
seven posts occupied.
VIII. California—(Department No. 10.)—The 2d regiment of infantry, and one company of the 3d artillery, which embarked at New York in November, 1848, arrived in California in April; and two other companies of infantry, which sailed about the 24th of December, arrived at San Francisco July 8th. In addition to the troops originally assigned to California, a light artillery company of the 1st regiment has been recently ordered to proceed by sea from Fort McHenry to San Francisco.

Careful examinations of every part of this interesting section of the country are pushed as rapidly as the means at the disposal of the general commanding will permit. The stations already established are San Diego, Monterey, Presidio of San Francisco, near the entrance of the bay, and two and a half miles from the town. Benicia, on the bay of San Francisco, at the upper end of the straits of Karquines, about thirty miles from the sea, has been selected as a general depot, for which it is reported to be conveniently situated, being accessible to the largest ships, and just below the junction of the Sacramento and San Joaquin rivers, between which are the principal mining districts. Camp Stanislaus, in the valley of the San Joaquin, and the post on the Sacramento, near Sutter's Fort, are intended as auxiliary depots in the direction of the mining districts; and any part of the mines, mountains, or country beyond, can be reached from them by the troops at almost any season. These posts will also aid the Indian agents in preventing the oppression of the peaceable Indians in that quarter by lawless white men, and check the tribes living on the slopes of the Sierra Nevada, who have manifested a decided hostility to the settlers. The San Joaquin valley being unhealthy during the rainy season, the troops stationed there will necessarily be withdrawn to the seacoast when it commences, about the first of November.

IX. Oregon, (Department No. 11,) and the Oregon route.—The two companies of the 1st artillery, which sailed from New York in November, 1848, for Oregon, arrived at the mouth of Columbia river the 13th of May. One company was stationed near Fort Vancouver, and the other near Tusqually, on Puget's sound. A particular examination of the country may result in the selection of other points for the permanent posts. Astoria, although represented as unfit for a military station, may, if not unhealthy, be occupied on account of the establishment there, by law, of a custom-house, which may for a time require the presence of troops.

The mounted riflemen moved westward from Fort Leavenworth, by detachments, in May. On the occasion of the march of this regiment to Oregon, instructions were issued according to the provisions of the 6th section of the act of May 19, 1846, and the original orders of the Secretary of War, of June 1, 1847, to establish two more of the chain of posts along the route to that territory—one to be at or near Fort Laramie, a trading station of the American Fur Company, some three hundred and fifty miles west of Fort Kearny; and the other at the trading establishment at Fort Hall, on the headwaters of the Columbia river, or somewhere on Bear river or its tributaries, near enough to the Mormon settlements, in the vicinity of Salt Lake, to draw supplies of subsistence and forage, and at the same time sufficiently near the direct road to Oregon to afford a stopping place for parties of emigrants to rest, repair their wagons, &c.

Fort Kearny, opposite Grand island, on Platte river, three hundred and ten miles west of Fort Leavenworth, the first in the chain of posts to Oregon, was garrisoned at the date of the last annual report by two com-
panies of the rifle regiment. These have since been relieved by one company 1st dragoons and two of the 6th infantry; but as it may not be practicable to provide sufficient quarters for the troops the present season, the commanding officer has been authorized to order one of the infantry companies to Fort Leavenworth.

The two companies of the rifle regiment, and one company of the 6th infantry, assigned to the second post in the chain, reached Fort Laramie in June, July, and August. After an examination of the country within sixty miles, the site of Old Fort Laramie, situated on the northwest bank of the Laramie river, one mile from its junction with the Platte, was decided to be the most eligible position for a military post, there being building material, good water, grass, and fuel, within a short distance. This post is regarded as of great importance, being in the midst of several powerful tribes of Indians, the principal of which, the Sioux and Crow, have never been friendly to the whites. The Pawnees also have shown a hostile disposition on various occasions, but more recently by murdering two mail carriers on the road between Fort Kearny and Fort Laramie.

X. The recruiting service.—This important branch of the service continues to be conducted with the usual good success. The general superintendents have been reduced to two, it being found unnecessary to keep up the district established in the western division of the army during the war with Mexico. Two field officers, fourteen captains, and twelve lieutenants, are employed for the general service. 5,197 recruits have been enlisted during the year ending October 31st.

The receiving depots and schools of instruction established at Fort Columbus, New York, and Newport barracks, Kentucky, for the artillery and infantry arms, and the one at Carlisle barracks, Pennsylvania, for the mounted regiments, greatly contribute to the economy and efficiency of the service, &c.

XI. The rank and file of the army.—Reports from various commands on the frontiers reiterate in forcible terms the embarrassment now, as heretofore, felt in consequence of the meagre standard of the present company organization, which, for the most part, makes their disposable force merely nominal.

The idea of numbers—of efficient strength—in our service, cannot well be understood, when they are computed by regiments and companies. For example: the total strength of the regiment of infantry, when it left Jefferson barracks, in August last, for field service in Florida, including sick and extra-duty men, was 361; and the average number of privates in the ten companies for duty was less than twenty-three.

The late "army of occupation," encamped near Matamoros, Mexico, March 29, 1846, consisted of fifty companies of infantry, seven companies of cavalry, and sixteen of artillery—in all, seventy-three companies, (equal to seven regiments and a battalion)—making only 2,651 men for duty, including drummers and fifers. The total strength of the companies for duty averaged about thirty-six men; but the average number of privates, no more than twenty-six—and that for an army in the field. No system of recruiting, however successful, has ever been able to keep the average strength of companies present for duty, on the basis of forty-two privates, at more than thirty privates—frequently less.

The utter insufficiency of the skeleton basis, (forty-two privates,) and
the real importance of the subject, which often and so closely involves
the public interests, will, I trust, be a sufficient apology for presenting it
again for consideration; and this I cannot better do than by laying before
you the annexed extracts from my annual report to your predecessor,
dated November 30, 1848:

"I beg leave respectfully and earnestly to request early attention to the
subject of a better organization of the peace establishment, with respect
to the rank and file of the several regiments, which the whole army be-
lieve should not be less than six hundred and forty privates each; that is,
sixty-four per company. There can be no doubt that efficiency and true
economy require that the authorized strength should never be less, any-
where; while the companies on the Pacific stations, in New Mexico, and
on the Texan frontiers, ought to be at least eighty and one hundred men.

"If the provisions of the act entitled 'An act to authorize an increase
of the rank and file of the army of the United States,' approved May 13,
1846, and which fixes the minimum number at sixty-four privates per
company, could be re-enacted, the requisite amelioration would be thus
easily obtained. It should be understood that the sliding scale, which
would authorize any increase above sixty-four, would apply only to com-
panies and regiments on remote frontier stations, as in Missouri, Texas,
New Mexico, &c. I beg leave to refer you to my report of July 13 upon
this subject, of which I annex an extract."

[Extract.—1]

"* * * By the act entitled 'An act to authorize an increase of
the rank and file of the army of the United States,' approved May 13,
1846, the President is empowered to increase the number of privates in
each of the regiments of the several regiments of the old army 'to any
number not exceeding one hundred, whenever, in his opinion, the exi-
gencies of the public service may require the same, and to reduce the
same to sixty-four, whenever the exigencies requiring the present increase
shall cease.' This is the basis, therefore, recognised by the President,
recommendecl by him 'as a sufficient force to be retained in the ser-
vice during a period of peace.' The minimum standard of sixty-four
privates was at the time intended to be a permanent and fixed number,
being in accordance with former recommendations of the department,
 strenuously urged, for years previously, by all experienced and practical
men in the service who had, upon so many occasions, in the field, tested,
and woefully tested, as the annals of the War Department show, the utter
insufficiency and unreliable number of the skeleton system of forty-two
privates to a company. When General Atkinson advanced, with six com-
panies of infantry, from Jefferson barracks, to suppress the first rising of
Black Hawk, in 1832, his war spirit derided the meagre force of two hun-
dred and forty men, when he saw the 'skeleton' companies, consisting of
thirty-two privates each. Again, in the battle of Withlacoochie, December
31, 1835, General Clinch's battalion of six companies of artillery was no
stronger, the total being only two hundred and forty; and the two 'skele-
ton' companies which met their fate under the gallant Dade, December 29,
1835, had altogether but sixty-five for duty, (only forty-nine privates in
both!) though, the day they marched from Tampa Bay, their number was
increased to ninety-seven, by transfers from other 'skeleton' companies,
which, as the sequel showed, was near proving fatal to the remaining
garrison, threatened as it subsequently was by a large Indian force, &c. The like evil of this extremely reduced system was seriously felt in the first operations of General Taylor’s army.’

The like evil of this extremely reduced system was seriously felt in the first operations of General Taylor’s army. “These facts I had occasion often to repeat in person to members of Congress, and friends, members of committees on military affairs, when respectfully urging an amelioration of the system, and which, being duly appreciated, was eventually effected by the act above cited, and the reinstating the standard provided for the peace establishment under the act of March 2, 1802, to wit: sixty-four privates for the infantry and artillery companies—being an aggregate of eighty officers and men to each company. From 1802 to 1821, the authorized number of privates in a company was never below sixty-four; and for five years after the reduction of the war establishment in 1815, the number for the infantry was sixty-eight, and for the artillery one hundred privates.”

The rank and file of the line of the army now authorized by law is 8,787—being 383 less than the peace establishment of 1808, and 2,809 less than the establishment of 1815. If the several companies of dragoons, artillery, and infantry be carried up to not less than sixty-four privates each, (the number authorized in the rifle regiment,) the increase would be 3,096 men; and if carried up to eighty, say in as many as five regiments, or fifty companies, under the discretionary authority of the President, as authorized by the act of May 13, 1846, the further increase would be 800 men—making the additional number 3,896, and thus increasing the rank and file to 12,683 men; being only 1,087 more than the peace establishment for the six years ending March, 1821.

Since the peace with Mexico, thirty-two new posts have been established on the frontiers.

I am, sir, with great respect, your obedient servant,

R. JONES,

Hon. G. W. Crawford, Adjutant General U. S. Army.

Hon. G. W. Crawford, Secretary of War.

(a) “Note.—The average number of privates for duty on the four memorable occasions referred to was thirty to a company, the standard being forty-two—making a deficiency of twelve men, or nearly twenty-five per cent. Assuming this ratio of deficiency as a basis, with an organization of sixty-four, eighty, and one hundred privates, the average number of privates for duty in each company would be forty-five, fifty-seven, and seventy-one, &c.”
### Organization of the Army of the United States, 1849.

<table>
<thead>
<tr>
<th>Service</th>
<th>Total Commissions</th>
<th>Regular Commissions</th>
<th>Regular Captains</th>
<th>Payne's Commissions</th>
<th>Payne's Captains</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Staff</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Field Service</td>
<td>2</td>
<td>5</td>
<td>17</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Artillery</td>
<td>3</td>
<td>6</td>
<td>18</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>Engineer</td>
<td>4</td>
<td>8</td>
<td>24</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>Medical Department</td>
<td>5</td>
<td>10</td>
<td>30</td>
<td>33</td>
<td>38</td>
</tr>
<tr>
<td>Corps of Topographical Engineers</td>
<td>6</td>
<td>12</td>
<td>36</td>
<td>39</td>
<td>44</td>
</tr>
</tbody>
</table>

**Regiments of Infantry:**
- 35th Regiment of Infantry
- 36th Regiment of Infantry
- 37th Regiment of Infantry
- 38th Regiment of Infantry
- 39th Regiment of Infantry

**Regiments of Artillery:**
- 1st Regiment of Artillery
- 2nd Regiment of Artillery
- 3rd Regiment of Artillery
- 4th Regiment of Artillery
- 5th Regiment of Artillery
- 6th Regiment of Artillery

**Miscellaneous:**
- Asst. Adjutant General
- Adjutant General
- Secretary of War
- Adjutant General's Office
- Paymaster General

**Total:**
- Full Commissions: 86
- Regular Commissions: 100
- Regular Captains: 120
- Payne's Commissions: 104
- Payne's Captains: 128

*Note:* The numbers represent the total number of officers and enlisted personnel for each category.

R. Jones, Adjutant General United States Army.
### General Return of the Army of the United States, from the latest returns, corrected at the Adjutant General's Office.

<table>
<thead>
<tr>
<th>Category</th>
<th>Regiment</th>
<th>Sub-Regiment</th>
<th>Total</th>
<th>Aggregate</th>
<th>Present and Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Officer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enlisted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enlisted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*Footnotes:
1. High-ranking officer grades and numerous lower ranks are represented, but the regimental structure and, to some extent, the exact composition, are not included as all officers in the aggregate. 18,056. The list below is applicable to the judge advocate, who holds a certificate in the absence department.
2. The roll contains 1 Army, 2 infantry, 1 cavalry, and 1 artillery; the total is 1. The total number of months required for the entire war is approximately 1,500 months. The numbers of officers and enlisted are given in the aggregate as of this report.*
### Position and Distribution of the Troops in the Eastern Division, under the command of Heret Major General John H. Wool.

<table>
<thead>
<tr>
<th>Commands of Military Departments</th>
<th>Posts</th>
<th>States</th>
<th>Commandant of Department</th>
<th>Commandant of District</th>
<th>Regiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Virginia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Remarks
- Not present: the words not legible.
- For occurring, including the few-handed to garrison the posts in Dacca, India, etc., duties for temporary service in Florida September 24, 1849.

---

Assistant General's Office, November 24, 1849.

R. Jones, Adjutant General United States Army.
### D.

**Position and distribution of the Troops in the Western Division, under the command of Genl. Major Genl. David E. Twiggs.**

<table>
<thead>
<tr>
<th>Com Interest</th>
<th>Pocket and Distribution</th>
<th>Casualties</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes
- German soldiers in the immediate vicinity of the Pocono mountains, November 14, 1864.
- German soldiers in the immediate vicinity of the Pocono mountains, December 14, 1864.
- German soldiers in the immediate vicinity of the Pocono mountains, January 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, February 14, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, March 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, April 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, May 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, June 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, July 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, August 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, September 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, October 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, November 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, December 15, 1865.
- German soldiers in the immediate vicinity of the Pocono mountains, January 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, February 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, March 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, April 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, May 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, June 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, July 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, August 15, 1866.
- German soldiers in the immediate vicinity of the Pocono mountains, September 15, 1866.
### Position and distribution of the Troops in the Third or Pacific Division, under the command of Gen. Major General Persifer F. Smith.

<table>
<thead>
<tr>
<th>COMMANDER OF MILITARY EMBRACED</th>
<th>Posts</th>
<th>Situation</th>
<th>PERMANENT COMMANDERS</th>
<th>REGIMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Department staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of companies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adjutant-General</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

- Post not yet established.

R. JONES, Adjutant General United States Army.
F.—Return of the troops employed in suppressing Indian hostilities in Florida, under the command of Brevet Major General David E. Twiggs.

<table>
<thead>
<tr>
<th>REGIMENTS AND CORPS</th>
<th>PRESENT</th>
<th>ABSENT</th>
<th>PRESENT &amp; ABSENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of companies</td>
<td>Brigadier general (captain)</td>
<td>Assistant adjutant general (captain)</td>
</tr>
<tr>
<td>General staff</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1st regiment of artillery</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2d regiment of artillery</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>3d regiment of artillery</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4th regiment of artillery</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Aggregate of artillery</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>7th regiment of infantry</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Aggregate</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>


R. Jones, Adjutant General U. S. Army.
Statement showing the number of recruits enlisted in the army from the 1st of October, 1848, to the 30th of September, 1849, inclusive.


- Brevet Brigadier General J. Garland, colonel 8th infantry, superintendent eastern department, headquarters New York: 2,408
- Brevet Colonel C. A. Waite, major 8th infantry, superintendent western department, headquarters Cincinnati, Ohio: 586
- Brevet Lieutenant Colonel P. St. G. Cooke, major 2d dragoons, superintendent for dragoons, headquarters Carlisle barracks, Pennsylvania: 361
- Corps of sappers and miners: 63
- Detachments at West Point: 34

Total: 3,459

2. By Regiments.

- First regiment of dragoons: 56
- Second regiment of dragoons: 43
- Regiment of mounted riflemen: 669
- Total mounted troops: 727
- First regiment of artillery: 266
- Second regiment of artillery: 117
- Third regiment of artillery: 93
- Fourth regiment of artillery: 63
- Total artillery: 541
- First regiment of infantry: 12
- Second regiment of infantry: 59
- Third regiment of infantry: 58
- Fourth regiment of infantry: 120
- Fifth regiment of infantry: 21
- Sixth regiment of infantry: 127
- Seventh regiment of infantry: 104
- Eighth regiment of infantry: 19
- Total infantry: 473
- Total number of recruits enlisted from the 1st of October, 1848, to the 30th of September, 1849: 5,192

3. Recapitulation.

- For the general service: 3,355
- By regiments.—Dragoons and mounted riflemen: 727
- Artillery: 541
- Infantry: 473
- Sappers and miners and detachments: 103
- Aggregate: 5,192

4. Recruiting Funds.

- Amount of recruiting funds in the hands of officers of the army September 30, 1848: $214,754
- Amount of recruiting funds advanced to officers of the army from October 1, 1848, to September 30, 1849: 39,637
- Amount of recruiting funds accounted for within the same period: 254,415
- Balance in the hands of recruiting officers September 30, 1849: 137,456
The greater portion of this balance pertains to the funds advanced, during the war with Mexico, to recruiting officers of the late additional regiments, and volunteer corps, or subsequently transferred, &c., whose accounts are not yet finally settled.

Respectfully submitted.

R. JONES,
Adjutant General United States Army.

Hon. G. W. CRAWFORD,
Secretary of War.
**Quartermaster General’s Office, Washington City, November 10, 1849.**

**Sir:** In obedience to your orders, and in compliance with the provisions of the regulations, I have the honor to present the report due from this office for the fiscal year commencing on the 1st of July, 1848, and terminating on the 30th of June last.

When the last annual report was presented, the balances in the hands of the officers of the department to be accounted for, with the sums in transitu from the treasury, amounted to $2,101,395.34

To which is to be added—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st. Remittances, <strong>viz:</strong></td>
<td></td>
</tr>
<tr>
<td>In the 1st quarter of the fiscal year</td>
<td>$1,536,030.00</td>
</tr>
<tr>
<td>In the 2d quarter of the fiscal year</td>
<td>1,516,282.34</td>
</tr>
<tr>
<td>In the 3d quarter of the fiscal year</td>
<td>575,866.00</td>
</tr>
<tr>
<td>In the 4th quarter ending 30th June, 1849</td>
<td>976,049.93</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,604,228.27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2d. Miscellaneous items, <strong>viz:</strong></td>
<td></td>
</tr>
<tr>
<td>Proceeds of the sales of public property</td>
<td>821,343.62</td>
</tr>
<tr>
<td>Military contributions in Mexico</td>
<td>62,473.28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>883,816.90</td>
</tr>
</tbody>
</table>

Making the amount to be accounted for 7,589,440.51

From which are to be deducted—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st. Expenditures, <strong>viz:</strong></td>
<td></td>
</tr>
<tr>
<td>Prior to the fiscal year, but the accounts of which were not received in time for the last report</td>
<td>1,039,648.22</td>
</tr>
<tr>
<td>In the 1st quarter of the fiscal year, Sept’ber 30, 1848</td>
<td>2,835,196.70</td>
</tr>
<tr>
<td>In the 2d quarter of the fiscal year</td>
<td>1,342,828.79</td>
</tr>
<tr>
<td>In the 3d quarter of the fiscal year</td>
<td>804,058.22</td>
</tr>
<tr>
<td>In the 4th quarter of the fiscal year</td>
<td>833,842.29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,815,926.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2d. Repayments:</td>
<td></td>
</tr>
<tr>
<td>Amount of sums deposited to credit of the treasurer</td>
<td>3,715.83</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6,859,290.05</td>
</tr>
</tbody>
</table>

Leaving to be accounted for 730,150.46

There are accounts due from thirty-six officers, **viz:** seven officers of the Quartermaster’s department, and twenty-nine officers of other branches.
of service, who have received funds on account of the department, most
of them in Oregon, California, New Mexico, and on the extreme frontiers
of Texas, whose joint accountability amounts to about four hundred
thousand dollars. The accounts of these officers, when received, will
reduce the balance outstanding to little more than three hundred thousand
dollars. That balance is applicable to the expenditures of the present
year, and, I have no doubt, will be faithfully accounted for.

From the commencement of the movement of the troops, in conse­
quence of the menacing attitude assumed by Mexico on the annexation
of Texas, to the close of the last fiscal year, the money accountability of
the department amounted to about forty-five millions of dollars. That
sum was distributed among five hundred and sixty-four officers, dispersed
over the continent, from the Atlantic to the Pacific, and from the northern
extremity of the Union to the Isthmus of Panama; and with so much
energy and good faith have those officers, with very few exceptions, per­
formed their duties, that less than half a million of dollars of that vast
amount remains to be accounted for. The quarterly accounts during the
period stated exceeded three thousand, all of which have been examined
in this office and sent to the treasury. It is understood that more than
two thousand of these remain unadjusted in the Third Auditor’s office.
I mention this fact not to censure any one, but because I consider it my
duty to call your attention, and that of the President, to the subject, that
the remedy, due alike to the public service and to the officers concerned,
be, if possible, applied.

When the estimates for the year were presented, the balance in the
hands of officers, as well as the amount which it was believed might be
realized from the sale of public property, was taken into the calculation
as a part of the means to be applied to the service of the year. Those
means, added to the appropriations, have been found equal to the demands
of the service, though I have been called upon to make many expendi­
tures not contemplated at the time the estimates were presented.

During the year a portion of the army employed in Mexico was with­
drawn from that country; means of transportation and supplies were fur­
nished for the troops ordered to occupy the newly-acquired territories and
the frontiers of Texas, and for the escort of the American boundary com­
mmissioner; transportation was furnished for the commissioner and his
party from New Orleans to Chagres, and for other civil agents from Fort
Leavenworth to Santa Fé, and across the continent.

Supplies and means of transportation have been furnished for the army
concentrated in Florida, and, under the orders of the department, horses
and equipments have been provided for the mounting of several infantry
companies there and in Texas; and supplies have been provided for a
volunteer force in Texas and New Mexico, and sea transportation for the
troops sent round Cape Horn to occupy California and Oregon.

There were furnished, for the transportation of the detachment sent by
land to Oregon and Santa Fé, six hundred and fifty-eight wagons, two
thousand four hundred and forty mules, three hundred and seventy-four
horses, and two thousand seven hundred and ninety-four oxen; and for
that to El Paso, New Mexico, two hundred and twenty wagons, seven
hundred and fifty horses and mules, and one thousand oxen; in addition
to which, one hundred and thirty-three thousand dollars was paid on
contracts for transportation to Santa Fé, Fort Kearny, and Fort Laramie.
Extensive repairs have been made at several of the military posts, which have been re-occupied; barracks and storehouses have been erected, or are being erected at many of the new posts, and the supplies due from the department have been furnished, according to the laws and regulations, at all the posts.

Under the orders of your predecessor, twenty-two steamers and nineteen sail vessels have been sold; and under his and your orders, five steamers have been turned over to the navy, and one to the coast survey, and to the topographical engineers a barque and two schooners; to the corps of engineers a schooner, and to the coast survey four schooners; four sail vessels have been sent to the Pacific, to be used as transports on the coast of California and Oregon; five steamers have been retained for service on the coast of Florida during the operations there, and three for service on the Rio Grande, and three schooners for transports on the gulf of Mexico.

Connected with the subject of transportation, both by land and water, I consider it my duty to recommend that measures be promptly taken to improve the harbors on the coast of Texas, as well as the rivers Rio Grande, Colorado, Trinity, and upper Red river, in that State; and also, that good roads be constructed on the shortest and best routes between the several frontier posts, and connecting those posts with the interior, not only in Texas, but throughout our whole Indian territory north of that State; and that like measures be taken to improve the upper Mississippi and the Missouri rivers, with all their navigable tributaries flowing through the Indian country. I recommend these improvements as military works of more importance in the defence of the country against the only enemy likely to assail us, than the best system of fortifications that could be adopted; and they will be found equally important in their bearing on the economy of the service.

It is highly important that the principal points to be occupied in all our new territories, whether as posts or depots, be determined upon with as little delay as possible; and, as the United States own no land in Texas, and probably none in New Mexico and California at the points proper to be occupied, it is necessary that the authority of Congress be obtained to purchase such sites as may be required. This authority may be so restricted as to guard against abuse; and, if granted, will save the officers of the army from ruinous suits, and the government from heavy claims for damages.

The appropriations for the present fiscal year, it is apprehended, will be entirely inadequate to the demands upon them. The estimates upon which they were made were minimum estimates for the army, without contemplating either increased force or active operations; but a volunteer force is employed in Texas, also in New Mexico, and troops have been concentrated in Florida, in consequence of apprehended hostilities with the Seminoles. The state of things in California has also greatly increased the expenditures there. These causes, combined, have increased the cost of transportation, forage, and the hire of laborers, greatly beyond the amount estimated.

The estimates for the next fiscal year are calculated for the existing state of things. They are as low as I can venture to make them, and as low as they will probably be for some years to come, unless a change take place in California, and the new territories improve in their cultiva-
tion so as to supply the subsistence and forage, at least, required for the troops who defend them.

In my last annual report I stated that no appropriation would be required for clothing and equipage for this and the next fiscal year. At the date of that report the proceeds of the sales of public property went to reinforce the current appropriations; but an act of Congress of the 3d of March last provides that the proceeds of such sales shall be placed in the treasury. That act, depriving the department of the means relied on, renders an appropriation necessary to pay the wages of operatives, and to purchase such articles not in store as may be necessary to complete the supplies that may be required.

The attention of this office has been repeatedly called to claims against the government for supplies and money advanced for prosecuting hostilities against Mexico during the late war—principally in New Mexico and California. Many of those claims are sustained, it is said, by informal papers; and were contracted by officers not known to the government as disbursing agents; but it is believed they were generally contracted in good faith for the public service. It may be that some of the demands are fraudulent, and others exorbitant; but further procrastination leaves the door open for the multiplication of similar claims, and, what is worse, will cause the innocent to be confounded, in many cases, with the guilty. Every dictate of justice and sound policy demands that these claims should be promptly, fairly, and literally met.

It is understood that merchants who were forced to pay duties in California, before as well as after the termination of the war, are taking measures to obtain the restoration of the moneys paid, by suits against the officers employed in their collection. Those officers will be thus exposed to interminable and vexatious annoyances, in a country so remote that a speedy redress of grievances will be impossible. Some action should be taken, either to protect the officers if the collections were right, or to restore the moneys collected if they were wrong. It is understood that, without a law of Congress, the officers who made collections subsequent to the termination of the war, and prior to the extension of the revenue laws of the United States to that territory, cannot settle their accounts.

There is necessarily a very heavy expenditure for the services of mechanics, laborers, teamsters, boatmen, sailors, veterinary surgeons, farriers, and other operatives, in the extended operations carried on over our vast territory; and often, from the want of proper legal control on the part of the officers, the services are badly performed. As a measure calculated to promote both economy and efficiency, I recommend that provision be made by law for enlisting the several classes enumerated for a period of at least two or three years, subject to the laws which govern the army, and entitled to all their benefits.

I consider it my duty to recommend that such a modification of the sub-treasury law be obtained as shall enable disbursing officers to deposit their funds with the assistant treasurers, and be allowed to check for them on those assistant treasurers as on banks; or, if this cannot be done, that they be allowed, on their own responsibility, to place the funds which they receive for disbursement in any safe banks, and to check on those banks. On this subject I append to this report a paper marked A, con-
taining remarks by Brigadier General Henry Whiting, assistant quartermaster general, in whose views I entirely concur.

With high consideration and respect, I have the honor to be, your most obedient servant,

TH. S. JESUP,
Quartermaster General.

Hon. G. W. Crawford, Secretary of War.

A.

Remarks on the present mode of keeping funds by the disbursing officers of the army.

The sub-treasury law, while it guards well the public funds during the process of collection, and afterwards in the hands of the assistant treasurers, seems to be particularly deficient in guards respecting them in all the subsequent stages; that is, between the issue from the sub-treasury and the disbursement by army officers. In the vaults of the mints and of the assistant treasurers, they are secured by arrangements that meet the object in view. After the funds leave these places, however, no securities are prescribed. Each officer is to take care of them in the best manner his caution or ingenuity suggests. The clothing department at Philadelphia and New York, by an early application, obtained from the mint at the one place, and the assistant treasurer at the other, the use of a vault, in which it has kept its funds. All other officers of the Quartermaster's department (probably officers of the other disbursing departments may be included) have, it is believed, been reduced to the necessity of hazarding their funds within their own offices—which have only the ordinary strength of common houses or stores; or, of making a private arrangement with some bank having spare vault room, and being willing to appropriate it to this use. The latter course has generally been adopted from necessity. Such an amount of specie as falls into the hands of a disbursing officer at any of the large stations, if placed in the houses or stores above alluded to, with all the guards the case admits, would be, of course, constantly liable to depredation. The fact of such deposits in such insecure places would generally be known, and invite attempts at robbing by the strongest hopes of success. That the officer is held responsible to the government for these funds does not protect the government from a loss that, in most instances, could have no remedy. To instance only my own case; which is not a rare one: my expenditures within the last nine months have reached about three millions of dollars. This amount has been received in specie, and paid out as such. Had this large sum been, as the law appears to suppose, taken under my personal charge and kept even in the strongest safes in my office, it is probable that much of it would have been abstracted by violence and ingenuity. If it be said that military guards could be obtained, such guards, having no commissioned officer over them, might prove, under the strong temptations of the case, the very perpetrators of the depredation.

It may also be remarked, that the labor of counting this amount at the incoming and outgoing would require an extraordinary force, and con-
sume an extraordinary portion of time. In some instances I paid out, in the course of a day, from one to three hundred thousand dollars. With my present arrangement this disbursement was done by myself, aided by three clerks; all other duties going on at the same time. Under the supposed circumstances, it is difficult to calculate the amount of force that would have been necessary. To count out two hundred thousand dollars in gold would be the ordinary work of a day—perhaps more. Duties of this kind upon a large scale, such as is found applicable to all our large stations, could not be performed in the manner the public service requires, with such impediments in the way. Business, in all places, adapts its facilities to the wants and necessities of the case. Had I not availed myself of such facilities as the city affords in the disbursements of the large sums alluded to, the Quartermaster’s department must either have enlarged its force to an unusual extent, or it must have been behind-hand in all its duties.

What is the proposed remedy for this evil? It is merely to recognize by law that which has been resorted to from necessity. When the disbursing officer receives money, it would seem to be just and proper that he should have a prescribed and sufficient mode of keeping it, while in his hands or under his charge. No practicable mode, on the score of economy and security, can be suggested, which does not allow this money to be lodged in such vaults as are everywhere regarded as alone sufficient to meet this risk. The object of the present treasury or specie arrangement can be and will be completely attained, by allowing the use of approved banks. They will admit this specie, and agree to pay it out again: this is all that seems to be wanted. It is true that banks have not always been sound: still, such banks can be selected, in all the large cities, as have stood firm for years, and promise all ordinary security for the future; and the amount introduced in them by disbursing officers is generally too inconsiderable to affect their operations. Besides, this amount is constantly fluctuating, and remains in their vaults but a brief period.

HENRY WHITING,
Assistant Quartermaster General, U. S. Army.

ASSISTANT QUARTERMASTER GENERAL'S OFFICE,
New York, March 14, 1849.
No. 9.

REPORT OF THE PAYMASTER GENERAL.

PAYMASTER GENERAL'S OFFICE,
October 31, 1849.

Sir: I have the honor herewith to submit a report of the transactions of the Pay department terminating with the fiscal year, on the 30th of June, 1849.

My annual reports since the commencement of the Mexican war show that within the fiscal year ending 30th June, 1847, paymasters expended and accounted for $7,752,390 34, and in the year terminating 30th June, 1848, $8,488,779 53, leaving a balance in their hands of $2,040,149 75 to be applied to the payments due within the first quarter of the last fiscal year, as will be seen by the tabular statement herewith. In addition to which, paymasters received during the year from the treasury and other sources, exclusive of transfers from one to another, $5,534,817 52, making the sum to be accounted for $7,574,967 27, of which there were expended in paying regular troops $3,364,898 95.

In paying volunteers - - - $2,358,047 22
In paying 3 months' extra pay to regulars - - - 414,903 15
In paying 3 months' extra pay to volunteers - - - 1,398,731 99
In paying military academy - - - 100,079 31

Total expended - - - 7,636,660 52

Leaving a balance of - - - 238,306 75

This balance, with the exception of $8,606 59 charged to deceased and disbanded officers, has been applied to the payment of accounts that did not become due until the year expired. The accounts are probably now on their way to this place and will be noticed in my next annual report. The $8,606 59 charged to deceased and disbanded officers, includes $2,100 deficit in money received by Paymaster Singer, at St. Louis, Missouri, in boxes which were not opened until he arrived at Santa Fe. This is the only charge made by officers of the department for loss by miscount, accident, robbery, or capture pending the war with Mexico, during which they expended near $24,000,000, the greater part in the enemy's country. To this I have the satisfaction to add, that not one dollar will be lost by defalcation, as paymasters and their sureties are abundantly able to pay not only the small balances which their statements show to be due the United States, but such vouchers as may be disallowed by the Treasury Department in the settlement of their accounts, all of which have been examined in this office.

Funds have been furnished to pay all the districts up to the last of August, and to such paymasters as have rendered their accounts, to the
last of October. It is believed from the information received, that the companies are now generally paid to the last of August and the officers to the last of September.

The settlement of claims for “three months’ extra pay” was, by the joint resolution of Congress of 29th July, 1848, transferred from the treasury to the Pay department “under such regulations as the Paymaster General, with the approval of the Secretary of War, shall establish.” To effect this, transcripts from the muster rolls of volunteers on file in the Adjutant General’s office were prepared, and paymasters sent to the places where the regiments and companies were either mustered into or out of service, and the claimants notified through the public prints that their claims would be settled at such places, if presented within a given time. Such as applied were paid, and those who did not were informed that their claims would be settled at this office when presented. The regular troops disbanded at the close of the war received extra pay at that time; the claims of others have been settled at this office. It was estimated that the “three months’ extra pay” would require three millions of dollars, and Congress appropriated accordingly. Of this sum $1,813,635 have been expended; the balance, it is believed, will be sufficient to pay the remainder of such claims. The balances in the treasury to the credit of the Pay department on the first day of the present fiscal year, exclusive of specific appropriations for the year, amount to $1,258,454 33. This will be quite sufficient to pay “arrearage claims” as they are audited, and to refund advances from “volunteer” appropriations and from “military contributions” in Mexico, used in paying the troops, which can be done by warrant, as paymasters’ accounts are settled in the treasury.

The business of the office, which had accumulated during the late war, has all been brought up; accounts are now examined as soon as received, turned over to the accounting officers for final settlement, and the result of the examination in this office communicated to paymasters without delay. From a report made to the Secretary of War in 1839, it appears that there were one hundred and twenty-eight paymasters employed in the war of 1812, and that the loss sustained by the United States on the disbursements of these paymasters was equal to 2.98\% per centum. A similar loss on the amount disbursed during the Mexican war, as made out from official documents and the records of this office, would amount to $712,753.22; instead of which, there remains but $8,606 59 to be accounted for, exclusive of the funds applied to the payments of the present year.

Respectfully submitted.

N. TOWSON,
Paymaster General.

Hon. Geo. W. CRAWFORD,
Secretary of War.
Statement showing the amount remaining in the hands of each of the disbursing officers of the Pay Department and unaccounted for on the 1st of July, 1848; the amount remitted to each from the Treasury, or turned over by other agents, during the fiscal year ending 30th of June, 1849; the amount accounted for by each by accounts and vouchers of expenditure, or by evidences of transfer to other agents, or of replacements in the Treasury, and the balance unaccounted for, to be applied to payments in the first quarter of the next fiscal year.

<table>
<thead>
<tr>
<th>Paymasters</th>
<th>Balances in hand and unaccounted for July 1, 1848</th>
<th>Amount remitted from the Treasury, or turned over by other agents during the year ending June 30, 1849</th>
<th>Total received to be accounted for</th>
<th>Amount expended in paying the army</th>
<th>Amount expended in paying volunteers</th>
<th>Amount expended in paying three months extra pay to Mounted Regular Troops</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. F. Learned, deputy paymaster general</td>
<td>$644 82</td>
<td>$175,883 45</td>
<td>$176,477 74</td>
<td>$68,477 74</td>
<td>$9,399 00</td>
<td>$1,519 00</td>
</tr>
<tr>
<td>D. Randall, do..............</td>
<td>788,289 28</td>
<td>1,283,283 62</td>
<td>2,071,518 90</td>
<td>51,519 42</td>
<td>3,995 77</td>
<td>2,058 00</td>
</tr>
<tr>
<td>T. J. Leslie................</td>
<td>174,388 09</td>
<td>1,477,426 24</td>
<td>1,584,584 33</td>
<td>413,380 63</td>
<td>57,258 00</td>
<td>26,105 50</td>
</tr>
<tr>
<td>D. S. Townsend..............</td>
<td>6,069 74</td>
<td>181,073 41</td>
<td>187,146 15</td>
<td>79,002 36</td>
<td>11,297 66</td>
<td>3,644 40</td>
</tr>
<tr>
<td>C. H. Smith*................</td>
<td>3,858 25</td>
<td>142,011 12</td>
<td>145,863 24</td>
<td>90,099 86</td>
<td>7,389 31</td>
<td>6,252 00</td>
</tr>
<tr>
<td>T. P. Andrews..............</td>
<td>30,178 25</td>
<td>605,263 49</td>
<td>605,362 49</td>
<td>605,362 49</td>
<td>49,325 55</td>
<td>34,111 50</td>
</tr>
<tr>
<td>Edmund Kirby...............</td>
<td>305,666 05</td>
<td>184,948 59</td>
<td>469,615 54</td>
<td>75,356 65</td>
<td>10,096 94</td>
<td>1,597 00</td>
</tr>
<tr>
<td>A. D. Stewart...............</td>
<td>129,508 27</td>
<td>298,945 84</td>
<td>428,454 11</td>
<td>35,914 33</td>
<td>2,143 92</td>
<td>37,617 00</td>
</tr>
<tr>
<td>Christopher Andrews........</td>
<td>23,935 61</td>
<td>168,928 43</td>
<td>224,220 46</td>
<td>122,600 29</td>
<td>44,925 55</td>
<td>34,111 50</td>
</tr>
<tr>
<td>B. Walker..................</td>
<td>37,010 14</td>
<td>1,315,773 49</td>
<td>1,552,758 63</td>
<td>284,943 72</td>
<td>48,688 48</td>
<td>23,865 00</td>
</tr>
<tr>
<td>E. Van Ness................</td>
<td>1,663 61</td>
<td>569,260 89</td>
<td>510,924 50</td>
<td>318,597 42</td>
<td>86,488 48</td>
<td>23,865 00</td>
</tr>
<tr>
<td>St. Clair Denny............</td>
<td>19,492 40</td>
<td>213,138 32</td>
<td>222,631 72</td>
<td>47,194 93</td>
<td>40,295 71</td>
<td>23,865 00</td>
</tr>
<tr>
<td>D. Hunter..................</td>
<td>5,977 27</td>
<td>277,361 76</td>
<td>283,338 85</td>
<td>129,651 77</td>
<td>10,564 66</td>
<td>31,766 14</td>
</tr>
<tr>
<td>L. J. Beall................</td>
<td>1,994 21</td>
<td>345,280 21</td>
<td>346,274 42</td>
<td>93,736 68</td>
<td>50,546 38</td>
<td>5,337 00</td>
</tr>
<tr>
<td>R. S. Dixy................</td>
<td>1,158 59</td>
<td>96,216 59</td>
<td>97,375 09</td>
<td>42,180 03</td>
<td>14,050 27</td>
<td>12,432 00</td>
</tr>
<tr>
<td>A. Van Buren................</td>
<td>2,953 64</td>
<td>50,505 27</td>
<td>53,488 91</td>
<td>43,907 21</td>
<td>93 17</td>
<td>2,637 00</td>
</tr>
<tr>
<td>R. A. Forsyth...............</td>
<td>40,153 37</td>
<td>282,316 38</td>
<td>283,469 15</td>
<td>55,273 64</td>
<td>207,239 73</td>
<td>888 00</td>
</tr>
<tr>
<td>A. J. Coffee..............</td>
<td>24,364 94</td>
<td>100,913 19</td>
<td>125,277 13</td>
<td>28,357 39</td>
<td>59,267 29</td>
<td>5,538 00</td>
</tr>
<tr>
<td>Henry Hill..................</td>
<td>2,000 00</td>
<td>96,726 41</td>
<td>98,726 41</td>
<td>57,032 43</td>
<td>35,880 43</td>
<td>357 00</td>
</tr>
<tr>
<td>J. Y. Dashiel..............</td>
<td>46,788 94</td>
<td>425,979 54</td>
<td>472,763 48</td>
<td>201,371 56</td>
<td>82,203 86</td>
<td>27,728 00</td>
</tr>
<tr>
<td>S. Maclain..................</td>
<td>20,301 63</td>
<td>70,791 76</td>
<td>91,093 39</td>
<td>46,946 32</td>
<td>3,233 88</td>
<td>615 00</td>
</tr>
<tr>
<td>Name</td>
<td>Amount 1</td>
<td>Amount 2</td>
<td>Amount 3</td>
<td>Amount 4</td>
<td>Amount 5</td>
<td>Amount 6</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>A. W. Gaines</td>
<td>3,139.40</td>
<td>185,652.95</td>
<td>188,792.35</td>
<td>55,193.88</td>
<td>27,465.45</td>
<td>15,234.00</td>
</tr>
<tr>
<td>Hiram Leonard</td>
<td>1,436.59</td>
<td>93,375.55</td>
<td>94,812.13</td>
<td>2,460.74</td>
<td>22,948.77</td>
<td></td>
</tr>
<tr>
<td>R. B. Reynolds</td>
<td>23,746.77</td>
<td>353,388.97</td>
<td>377,135.74</td>
<td>9,665.31</td>
<td>160,502.29</td>
<td>2,457.00</td>
</tr>
<tr>
<td>A. G. Bennett</td>
<td>6,871.74</td>
<td>263,955.01</td>
<td>270,666.75</td>
<td>88,601.96</td>
<td>27,379.21</td>
<td>8,913.00</td>
</tr>
<tr>
<td>F. A. Cunningham</td>
<td>4,101.95</td>
<td>197,764.62</td>
<td>201,866.57</td>
<td>57,748.57</td>
<td>49,990.29</td>
<td>17,534.00</td>
</tr>
<tr>
<td>G. C. Hutter</td>
<td>500.00</td>
<td>300,469.88</td>
<td>300,969.88</td>
<td>37,390.05</td>
<td>49,204.09</td>
<td>1,767.00</td>
</tr>
<tr>
<td>A. J. Smith</td>
<td></td>
<td>8,188.20</td>
<td>8,188.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. S. Stacy</td>
<td>74,623.35</td>
<td>93,022.25</td>
<td>157,645.60</td>
<td>69,136.84</td>
<td>36,077.76</td>
<td>6,627.00</td>
</tr>
<tr>
<td>J. C. Patrtridge</td>
<td>523.18</td>
<td>315,343.38</td>
<td>318,908.56</td>
<td>50,630.22</td>
<td>154,794.37</td>
<td>477.00</td>
</tr>
<tr>
<td>C. Bodine</td>
<td>74,292.70</td>
<td>232,542.06</td>
<td>306,834.76</td>
<td>80,418.08</td>
<td>113,806.39</td>
<td>2,041.00</td>
</tr>
<tr>
<td>B. W. Bruce</td>
<td>7,720.68</td>
<td>103,823.47</td>
<td>111,544.15</td>
<td>61,639.64</td>
<td>15,523.25</td>
<td>775.00</td>
</tr>
<tr>
<td>P. J. Crutchfield</td>
<td>870.14</td>
<td></td>
<td>870.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. Singer</td>
<td>63,376.67</td>
<td>217,000.00</td>
<td>260,376.67</td>
<td>87,668.05</td>
<td>95,786.11</td>
<td>18,660.00</td>
</tr>
<tr>
<td>N. Johnston</td>
<td>98,423.80</td>
<td>142,742.60</td>
<td>214,166.40</td>
<td>39,477.47</td>
<td>77,212.93</td>
<td>1,189.00</td>
</tr>
<tr>
<td>F. Bosworth</td>
<td>1,648.17</td>
<td></td>
<td>1,648.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Spalding</td>
<td>3,000.00</td>
<td></td>
<td>3,000.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. S. Bryant</td>
<td>28,334.53</td>
<td>671,304.97</td>
<td>679,629.50</td>
<td>158,952.57</td>
<td>425,991.96</td>
<td>16,304.00</td>
</tr>
<tr>
<td>G. H. Wilder</td>
<td>85.62</td>
<td>105,192.69</td>
<td>105,278.31</td>
<td>35,294.51</td>
<td>25,346.28</td>
<td>15,370.00</td>
</tr>
<tr>
<td>A. W. Burnette</td>
<td>62,099.61</td>
<td>202,419.01</td>
<td>204,518.62</td>
<td>28,562.94</td>
<td>40,776.40</td>
<td>297.00</td>
</tr>
<tr>
<td>William Rich</td>
<td>3,815.32</td>
<td>3,815.32</td>
<td>7,630.64</td>
<td>1,583.08</td>
<td>703.26</td>
<td></td>
</tr>
<tr>
<td>V. E. Pioletti</td>
<td>832.74</td>
<td>295,758.98</td>
<td>296,591.72</td>
<td>26,550.62</td>
<td>27,630.34</td>
<td>10,677.00</td>
</tr>
<tr>
<td>J. C. Bergh</td>
<td>8,240.15</td>
<td>175,849.59</td>
<td>184,089.74</td>
<td>566.70</td>
<td>80,530.32</td>
<td>1,278.00</td>
</tr>
<tr>
<td>A. B. Ragan</td>
<td>200.00</td>
<td>123,245.36</td>
<td>123,445.36</td>
<td>36,811.77</td>
<td>22,028.47</td>
<td>24.00</td>
</tr>
<tr>
<td>R. Strange</td>
<td>240,345.90</td>
<td>240,345.90</td>
<td>56,751.48</td>
<td>49,472.67</td>
<td>11,536.00</td>
<td></td>
</tr>
<tr>
<td>J. W. Spratley</td>
<td>7,000.00</td>
<td>7,000.00</td>
<td>1,565.24</td>
<td>83.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2,040,149.75  12,348,942.81  14,398,392.56  3,364,898.95  2,358,047.22  414,903.15

*Resigned.  †Dead.  ‡Disbanded.  §Disbanded; balance since reduced to $4,482.08.
<table>
<thead>
<tr>
<th>Paymasters</th>
<th>Amount expended in paying three months' extra pay to disabled volunteers</th>
<th>Amount expended in paying the military academy</th>
<th>Amount turned over to other agencies or replaced in the Treasury</th>
<th>Total accounted for</th>
<th>Balances unaccounted for to be applied to payments in first quarter of the next fiscal year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. F. Larned, deputy paymaster general</td>
<td>$133 53</td>
<td>$13,650 72</td>
<td>$70,207 00</td>
<td>$163,387 77</td>
<td>$13,140 50</td>
</tr>
<tr>
<td>D. Randall, do</td>
<td>559 00</td>
<td>86,423 59</td>
<td>2,013,216 35</td>
<td>2,071,378 54</td>
<td>134 36</td>
</tr>
<tr>
<td>T. J. Leslie</td>
<td>21,002 00</td>
<td>985,909 01</td>
<td>179,052 92</td>
<td>1,584,584 33</td>
<td>8,083 23</td>
</tr>
<tr>
<td>D. S. Townsend</td>
<td>10,106 50</td>
<td>75,000 00</td>
<td>203,481 11</td>
<td>2,139 99</td>
<td></td>
</tr>
<tr>
<td>C. H. Smith, *</td>
<td>5,453 00</td>
<td>37,685 70</td>
<td>487,035 12</td>
<td>1,584,584 33</td>
<td>3,279 88</td>
</tr>
<tr>
<td>T. P. Andrews</td>
<td>20,107 07</td>
<td>70,863 00</td>
<td>405,384 63</td>
<td>20,819 48</td>
<td></td>
</tr>
<tr>
<td>Edmund Kirby</td>
<td>19,942 94</td>
<td>400,076 53</td>
<td>3,279 88</td>
<td>20,819 48</td>
<td></td>
</tr>
<tr>
<td>A. D. Stuart</td>
<td>49,783 76</td>
<td>209,334 00</td>
<td>3,279 88</td>
<td>20,819 48</td>
<td></td>
</tr>
<tr>
<td>Christopher Andrews</td>
<td>6,738 03</td>
<td>31,718 75</td>
<td>3,279 88</td>
<td>20,819 48</td>
<td></td>
</tr>
<tr>
<td>B. Walker</td>
<td>94,112 00</td>
<td>1,160,537 07</td>
<td>1,584,584 33</td>
<td>4,734 79</td>
<td></td>
</tr>
<tr>
<td>E. Van Ness</td>
<td>31,846 50</td>
<td>43,008 14</td>
<td>503,625 44</td>
<td>7,298 96</td>
<td></td>
</tr>
<tr>
<td>St. Clair Denny</td>
<td>25,563 21</td>
<td>97,061 64</td>
<td>214,318 48</td>
<td>18,249 24</td>
<td></td>
</tr>
<tr>
<td>D. Hunter</td>
<td>64,395 79</td>
<td>20,190 61</td>
<td>256,570 97</td>
<td>26,667 88</td>
<td></td>
</tr>
<tr>
<td>L. J. Beall</td>
<td>234,532 93</td>
<td>66,368 49</td>
<td>340,521 28</td>
<td>6,053 14</td>
<td></td>
</tr>
<tr>
<td>R. S. Dix†</td>
<td>19,044 00</td>
<td>8,653 59</td>
<td>96,239 89</td>
<td>1,135 20</td>
<td></td>
</tr>
<tr>
<td>A. Van Buren</td>
<td>2,849 00</td>
<td>6,058 64</td>
<td>53,545 02</td>
<td>25 05</td>
<td></td>
</tr>
<tr>
<td>R. A. Frazier</td>
<td>26,965 93</td>
<td>19,919 50</td>
<td>3,029 04</td>
<td>25 05</td>
<td></td>
</tr>
<tr>
<td>A. J. Coffee</td>
<td>10,258 60</td>
<td>16,138 97</td>
<td>119,550 65</td>
<td>5,727 48</td>
<td></td>
</tr>
<tr>
<td>G. H. Ringgold</td>
<td>168 00</td>
<td>400 00</td>
<td>93,387 85</td>
<td>4,887 56</td>
<td></td>
</tr>
<tr>
<td>Henry Hill</td>
<td>110,566 00</td>
<td>44,899 84</td>
<td>467,468 26</td>
<td>5,300 22</td>
<td></td>
</tr>
<tr>
<td>J. Y. Dashiel</td>
<td>27,944 00</td>
<td>8,709 75</td>
<td>87,448 95</td>
<td>3,644 44</td>
<td></td>
</tr>
<tr>
<td>S. Macklin</td>
<td>69,495 00</td>
<td>8,709 75</td>
<td>171,817 85</td>
<td>16,974 50</td>
<td></td>
</tr>
<tr>
<td>A. E. Jamison</td>
<td>25,902 63</td>
<td>8,709 75</td>
<td>94,812 13</td>
<td>5,072 48</td>
<td></td>
</tr>
<tr>
<td>A. W. Gaines</td>
<td>109,788 63</td>
<td>43,006 00</td>
<td>325,413 23</td>
<td>51,722 57</td>
<td></td>
</tr>
<tr>
<td>Hiram Leonard</td>
<td>101,314 74</td>
<td>17,259 71</td>
<td>265,192 91</td>
<td>5,672 84</td>
<td></td>
</tr>
<tr>
<td>R. B. Reynolds</td>
<td>69,394 00</td>
<td>17,259 71</td>
<td>291,966 57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Pay Stated</td>
<td>Pay Served</td>
<td>Balance Due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
<td>----------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. C. Hutter</td>
<td>47,354 45</td>
<td>62,000 00</td>
<td>198,275 59 2,694 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. J. Smith</td>
<td>7,188 20</td>
<td>7,188 40</td>
<td>157,645 60 1,000 00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. S. Stacey</td>
<td>55,504 00</td>
<td>55,504 00</td>
<td>318,868 56 306,824 76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. C. Patridge</td>
<td>13,589 00</td>
<td>89,383 97</td>
<td>111,544 15 870 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Bodine</td>
<td>1,362 00</td>
<td>110,187 29</td>
<td>306,824 76 306,824 76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. W. Breck</td>
<td>420 00</td>
<td>33,186 23</td>
<td>111,544 15 870 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. J. Crutchfield</td>
<td>38,130 43</td>
<td>34,550 00</td>
<td>274,794 59 5,582 08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W. Singer</td>
<td>24,176 00</td>
<td>100,300 00</td>
<td>241,166 40 1,648 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. Johnston</td>
<td>38,130 43</td>
<td>34,550 00</td>
<td>274,794 59 5,582 08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Bosworth</td>
<td>24,176 00</td>
<td>100,300 00</td>
<td>241,166 40 1,648 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Spalding</td>
<td>87,791 07</td>
<td>8,589 90</td>
<td>697,629 50 3,000 00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. S. Bryant</td>
<td>14,341 00</td>
<td>28,000 00</td>
<td>71,426 26 71,426 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. H. Wilder</td>
<td>20,311 00</td>
<td>9,056 52</td>
<td>105,276 91 105,276 91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. W. Burnett</td>
<td>20,311 00</td>
<td>9,056 52</td>
<td>105,276 91 105,276 91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>William Riche</td>
<td>10,542 15</td>
<td>183,942 00</td>
<td>306,120 49 306,120 49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V. E. Pleitl</td>
<td>5,344 30</td>
<td>5,344 30</td>
<td>5,344 30   5,344 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. C. Bergh</td>
<td>94,759 00</td>
<td>66,956 76</td>
<td>226,570 92 20 80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. B. Ragan</td>
<td>79,347 07</td>
<td>22,367 12</td>
<td>184,089 74 184,089 74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. H. Weightman</td>
<td>64,581 12</td>
<td>64,581 12</td>
<td>182,445 86 182,445 86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. Strange</td>
<td>41,773 00</td>
<td>80,710 68</td>
<td>240,293 53 52 07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. W. Spratley</td>
<td>3,990 00</td>
<td>3,990 00</td>
<td>3,990 00   3,990 00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Paymaster General's Office, October 31, 1849.**

N. TOWSON, P. M. G.
No. 10.

REPORT OF THE COMMISSARY GENERAL.

Office of Commissary General of Subsistence,
Washington, November 2, 1849.

Sir: I have the honor to submit the following report of the operations of this department during the past year.

At the termination of the war with Mexico, the army was distributed over the extended territory of the United States, not only occupying the posts garrisoned prior to the war, but assigned to points in Texas, Santa Fé, California, and Oregon. A large portion of the troops have been in movement towards the points to be occupied; and this, together with the want of time, prevented contracts for the past year being formed. Supplies were therefore purchased in the open market; and the effort to furnish good and wholesome provisions at every point has met with complete success.

In July last, advertisements were issued for proposals to supply by contract, for the year commencing July 1, 1850, that portion of the army then stationary; but ere the bids were opened, in October, a large part of that portion was in movement. Contracts were therefore made only for the troops at those posts which it was supposed would remain garrisoned during that year. The remainder of the army must be supplied by purchase.

The system of "contracts" is so objectionable, that I respectfully recommend that it be abrogated altogether. The bids are received, and contracts formed, nine months prior to the first, and eighteen months prior to the last delivery. During these intervals, fluctuations in the price of the rations usually occur. If the price falls, the United States lose the difference; if it rises, many contractors fail in their deliveries, and the department is compelled to purchase under the most disadvantageous circumstances, to prevent suffering to the troops. Changes are frequently made in the position of the troops during these intervals, and the department is burdened by the provisions being delivered at points where they are not required.

Thirty years' experience in directing the operations of this department has convinced me that the army is supplied with better provisions, and at a less cost to the government, by purchase in the open market, than by the system of contracts.

It affords me pleasure to state, that all accounts of officers and agents of this department, up to the third quarter of the present year, have been examined in this office, and transferred to the Third Auditor; and that, in consequence, I shall be able to dispense with two of the three additional
clerks authorized by the act of August 12, 1848. The correspondence and general business of the office still being large, the services of the third are necessary, and cannot be dispensed with.

Most respectfully, your obedient servant,

GEO. GIBSON,

Commisary General of Subsistence.

Hon. G. W. CRAWFORD,
Secretary of War.
No. 11.

REPORT OF THE SURGEON GENERAL.

SURGEON GENERAL'S OFFICE,

November 7, 1849.

Sir: In obedience to your instructions of the 5th of September last, I have the honor to make to you "the usual annual report of the operations of the medical department of the army," for the year ending on the 30th of June, 1849.

The amount of the appropriation for the medical and hospital department remaining on the 30th of June, 1848, was:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the hands of disbursing agents</td>
<td>$10,510.00</td>
</tr>
<tr>
<td>In the treasury of the United States</td>
<td>72,634.69</td>
</tr>
<tr>
<td>Add to this the amount appropriated, per act of Congress of the 14th of August, 1848</td>
<td>112,000.00</td>
</tr>
<tr>
<td>And the amount received from medical officers of the army, for medical supplies sold in Mexico</td>
<td>2,600.12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$197,744.81</strong></td>
</tr>
</tbody>
</table>

Of this sum, there has been expended on account of pay and other claims of private physicians | 29,470.69 |
| On account of medical supplies, &c., &c. | 42,433.52 |
| Leaving in the hands of disbursing agents | 10,817.37 |
| And in the treasury of the United States | 115,023.23 |
| **Total** | **$197,744.81** |

It is proper to remark here, that since the first of July last, up to which period the above statement of expenditures, &c. is rendered, a large amount of disbursements, made during the war with Mexico by quartermasters and other public agents, under the orders of military commanders, for medical and hospital supplies, the pay of private physicians, &c., &c., have been transferred and charged against the appropriation for the medical and hospital department of the army; thus reducing very materially the balance reported to the credit of the department in the treasury of the United States. And as there are other similar accounts already in the Treasury Department to be settled, and many more claims are still to come in for adjustment, it is believed that the whole amount of the balances, $125,840.60, will be required to pay off the arrearages.

I have, accordingly, made my estimate for the usual amount of funds to meet the requirements of the service for the fiscal year ending June 30, 1851.

The returns of public property, &c., required by the regulations of the army from the different military hospitals, have been regularly rendered;
and, as these papers exhibited every article of supply received, whether from the medical purveying department or obtained by special purchase, and satisfactorily accounted for all expenditures of the same, the accounts of the medical officers have been settled in this office—those at a distance to the 31st of March, and those in nearer sections of the country up to the 30th of September of the present year.

The number of officers and men remaining sick on the 30th of June, 1848, was 999; and the number of cases of disease which have occurred within the twelve succeeding months is 28,013; making an aggregate of 29,012 cases of indisposition that have been under medical treatment during the year ending the 30th of June, 1849.

Of the whole number of sick reported, 26,349 have been restored to duty; 23 are on furlough; 702 have been discharged the service; 44 have deserted, and 734 have died; leaving, on the 30th June, 694 still on the sick report.

The number of officers and men remaining sick on the 30th of June, 1848, was 999; and the number of cases of disease which have occurred within the twelve succeeding months is 28,013; making an aggregate of 29,012 cases of indisposition that have been under medical treatment during the year ending the 30th of June, 1849.

Of the whole number of sick reported, 26,349 have been restored to duty; 23 are on furlough; 702 have been discharged the service; 44 have deserted, and 734 have died; leaving, on the 30th June, 694 still on the sick report.

The mean strength of the army for the last twelve months being, according to the reports received from the different military posts, 9,148, and the number of cases of indisposition reported for the same period being 28,013, it will be perceived that the proportion of cases of disease to the number of officers and enlisted men in the service was 3.06 to one, or that, on an average, each man was sick about three times during the year; that the ratio of deaths to the number of men was as one to 12.46, or 8.02 per cent; and the proportion of deaths to the number of cases under treatment as one to 39.52, or 2.53 per cent.

Several circumstances contributed to this unusual mortality in the army, the principal of which were the prevalence of the epidemic cholera and of yellow fever at a number of the military posts and stations of the country. Of cholera, there were 616 cases and 307 deaths; and of yellow fever, there were 135 cases and 52 deaths. But by far the greatest number of cases of disease were dysenteries and diarrhœas, the sources of which may be traced to the toils and exposure of the men while serving in camp and in the field during the war with Mexico. Of diarrhœa and chronic dysentery alone, there were 7,228 cases; and of these 160 terminated fatally.

Since my last annual report, a medical board for the examination of applicants for appointment to the medical staff of the army was convened in the city of New York on the first day of May, 1849.

By this board three assistant surgeons were examined, who having fully come up to the standard of professional merit required, were accordingly recommended for promotion.

Before this board seventy-five candidates were authorized to present themselves for examination, fifty-two of whom only reported to the board.

Of the number who reported, eighteen withdrew of their own accord; the invitation of one was recalled; seven were found physically disqualified, and twenty-six underwent the examination; and of these last, nine were approved and recommended for appointment.

Not having obtained as many approved candidates as were required to fill the vacancies in the grade of assistant surgeon, another medical board was convened in the city of Philadelphia on the 15th of last month to examine applicants for appointment to the medical staff of the army; but as the board is still in session, the result of their examinations cannot be given in this report.

It is confidently expected, however, that a sufficient number of candi-
dates will be passed by the board, not only to fill the vacancies already existing in the corps, but also to meet the casualties of the current year. All of which is respectfully submitted.

TH. LAWSON,
Surgeon General.

Hon. Geo. W. Crawford,
Secretary of War.
Annual report of the sick and wounded of the Army of the United States for the year ending June 30, 1849.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TAKEN SICK OR WOUNDED IN BATTLE DURING THE YEAR.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TH. LAWSON, Surgeon General.
Sir: The following report exhibits the progress and condition of the affairs committed to this department during the past year:

FORTIFICATIONS, AND MILITARY ESTABLISHMENTS CONNECTED THEREWITH.

A careful inspection of most of the operations connected with the defences of the seacoast and northern frontiers, and an active correspondence in relation to those that I have not been able personally to examine, enable me to state that these works have advanced as rapidly, during the past year, as was practicable, within the moderate means at command, and under a deficiency in the number of officers that in some cases has been very sensibly felt. The labors have been conducted with characteristic fidelity, intelligence, and attention to economy.

During the last three years, the average of the appropriations for fortifications has been materially below that of several years preceding, and much below what would seem to have been demanded by our weakness at several important points. But, though it is certainly true that we have cause for uneasiness, and need the greater efforts, in respect to these exposed places, it is gratifying to be able to state that the condition of the defences in general is greatly advanced, affording security for a large portion of the border that, within ten years, was either wholly unprotected or incapable of resisting enterprises of even moderate force.

I cannot suppose it necessary for me to discuss here the necessity of a good system of frontier defences, especially of a system of seacoast defences. This whole subject has been frequently under consideration. It has, for a long course of years, received the support, and been deemed the settled policy, of the country, as may be seen by reference to several documents, among which I beg leave to designate one in particular, as being an interesting summary of what has been accomplished, and what was still contemplated. See Document No. 206, House of Representatives, 26th Congress, 1st session. Moreover, while there have been, among high military authorities, diversities of opinion as to the advantages of a highly-fortified frontier when extending along an imaginary line upon land, I am not aware that any doubts have been entertained by such authorities in relation to fortifying the important points of a seacoard.

We know it to have been the invariable practice of all nations possessing a seacoast, and not less of those nations boasting the highest naval power, to fortify their seaports thoroughly, and particularly to multiply those means of resistance in all their great centres of trade and commerce, and around all their naval establishments. And especially do we know
that recent improvements in cannon, and the modern application of steam to naval navigation, have led these powers to renewed anxieties as to the security of their coasts, to a formal review of their means of defence, and to an augmentation of their means of defence by fortifications. This kind of protection is not, as some have thought, an old necessity, made obsolete by modern improvements in the instruments of maritime warfare: it, on the contrary, has been made by these improvements more than ever indispensable. An enemy can now come with a suddenness forbidding the use of other kinds of preparation—even of those extemporaneous resorts to which some would intrust the protection of all the places on the coast. He can now enter by avenues before sealed up by bars and shoals. We can gain no time from adverse winds and tempestuous seasons for an organization or array of defensive means; and he will allow us to find no security in distance.

These late improvements, however, while they increase the necessity for a system of defence that shall be always ready and always efficient, do not, happily, lessen the relative power of these defences with respect to the means of attack. Additional batteries will now be required, because the shallow channels also must be commanded; but, gun for gun, the new relation is more in favor of the forts than the old, because the war steamer, which to so great an extent is now substituted for the sailing vessel of war, while she carries fewer guns, exposes a larger vulnerable surface to the fire of the batteries; and the Paixhan shell, which, in the timbers, between the decks, and among the machinery of the steamer, must be a dreadful missile, will, in return, have even less effect upon the massive masonry of the fortifications than the solid shot which it has displaced.

The superintending engineer officers, in preparing estimates for the next fiscal year, have considered severally what was required by the general system of defence, and what by the economical interests of their particular works: in other words, they have studied how best to advance the system, and at the same time lessen the final cost of the portion in their hands. It would be greatly to the advantage of the country, on the score of ultimate cost—to say nothing of an earlier state of security—to grant the full amount of these estimates. But on the supposition that the government would desire to conform more nearly to the average expenditures of former years, I have greatly moderated the demands of the officers. The estimate handed in by the Engineer Department is, by $765,628, less than the sum of those furnished by the officers. Should any political urgency arise before the action thereon by Congress, it may be necessary to ask for a considerable increase in the amounts of the estimates.

In presenting a true statement of the condition and wants of this portion of the public service, I acquit myself of my merely official duty. But, in the full knowledge of our weakness at many points, and under a deep conviction of the grave consequences likely to flow from delay or tardiness in the prosecution of the system of defence, the duty of patriotism requires that I should urge for it, with all admissible emphasis, the liberal support of the Executive and Congress.

Within the last few years, the indemnity question with France, the McLeod question, the northeastern boundary question, the Oregon question, have each in turn excited public alarm, rousing the people from a
state of indifference, if not security, to look anxiously into the preparations made by the government for their protection. And, in each instance, there has been no little clamor because so much still remained to do. This brief portion of our history is very instructive, as showing how suddenly and unexpectedly, from a state of profound peace, and in relations of amity apparently well settled with all the world, the nation may be brought into a condition where a want of those military preparations which are necessarily the work of time, is felt to be a great fault, as well as a great misfortune. In reference to this duty of preparation, I dare not assume that the present period is one not liable to any such surprise.

Besides the works finished, those in progress, and those under repair—of which more particular mention will now be made—it is of the first necessity that certain new forts should be authorized by Congress, at the earliest day practicable. These will be specified in their respective geographic positions. They have been heretofore recommended by committees of Congress, as well as by the Executive and by this department.

Fort Wayne, and barracks and quarters thereat, Detroit, Michigan.—The fort being finished, the money expended during the year has been applied exclusively to the barracks, quarters, and hospital, with the exception of a small amount necessary to preserve the slopes of earth.

The exterior of the barracks for five companies is nearly completed, with some of the interior finish; two sets of quarters are finished, a third is roofed in, and the foundations of three sets and of a hospital have been laid.

Balance in the treasury, September 30, 1849 - $6,486 43
Probable amount to be expended by June 30, 1850 - 6,486 43
Estimate of amount required to be appropriated for the fiscal year ending June 30, 1851 - 15,000 00

Fort Porter, near Buffalo, New York.—The operations of the year have been confined to slight repairs of the tower and quarters, and the erection of a fence around the public lands.

Balance in the treasury, September 30, 1849 - $22,850 00
Probable amount to be expended by June 30, 1850 - 22,850 00
No appropriation asked for next year.

Fort Niagara, New York.—Operations for the year have been confined to slight repairs. With the available balance of funds, barracks and a new hospital are to be erected, being necessary to the comfort of the garrison.

The estimate of the officer in charge for the next year, $10,000, is for the erection of barracks and storehouses, and for permanent gun-platforms.

Balance in the treasury, September 30, 1849 - $4,100 69
Probable amount to be expended by June 30, 1850 - 4,100 69
No amount is asked for the next fiscal year.

Fort Ontario, Oswego, New York.—The balance of the appropriation for this work, together with a small sum derived from contingencies of fortifications, has been applied to the repair of barracks and quarters.
No further appropriation asked.
Fort Montgomery, outlet of Lake Champlain, New York.—The work of the season may be summed up as follows: 3,452 cubic yards of masonry have been laid, principally in scarp walls and piers; 21,000 cubic yards of earth have been embanked in the coverface, and 5,000 in the parade; the piling, grillage, and masonry foundations of barracks executed; and several floors have been laid in quarters, gun casemates, and magazines.

Balance in the treasury on the 30th September, 1849  $5,000 00
Probable amount to be expended by 30th June, 1850  - 5,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 15,000 00

Fort Knox, narrows of Penobscot, Maine.—Work has been confined to blasting rock and excavation of earth: of the former, 15,050 cubic yards have been removed; of the latter, 10,070 cubic yards. This has exhausted the appropriation. With the amount asked by the officer in charge for the next year, ($75,000,) he would be able to finish the blasting, complete some of the outworks and their communications, and raise the scarp of the main work on two fronts to the height of 20 feet. The Engineer department has, however, kept its estimate much below that sum.

Balance in the treasury on the 30th September, 1849  $3,000 00
Probable amount to be expended by 30th June, 1850  - 3,000 00
Estimate of amount required to be appropriated for the fiscal year ending 30th June, 1851 - 20,000 00

Fort Preble, Portland, Maine.—The repairs of the quarters and barracks are finished; lightning-rods have been raised on magazines and buildings; drains constructed; pavement laid; a shot furnace erected; gun platforms laid; and the repairs and modifications of this work may now be considered essentially complete. No further appropriation asked.

Balance in the treasury on the 30th September, 1849  $900 00
Probable amount to be expended by 30th June, 1850  - 900 00

Fort Scammel, Portland, Maine.—Since October 1, 1848, the sodding of banquette and rampart slopes has been finished. All the traverse circles have been set except at the posterns; the main entrance built up to the height of springing lines of arch; 300 running feet of road have been graded; the masonry of the wharf completed, except setting 140 running feet of coping; the foundation of block-house has been encased with a wall; and sundry minor repairs executed.

Balance in the treasury on the 30th September, 1849  $2,300 00
Probable amount to be expended by 30th June, 1850  - 2,300 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 5,000 00

Fort Constitution, Portsmouth harbor, New Hampshire.—No repairs have been found necessary during the year, and no appropriation is required.

Fort McClary, Portsmouth harbor, New Hampshire.—Nothing more
has been done during the year than permanently marking the boundaries of the public land and applying some slight repairs to the block-house.

Balance in the treasury on the 30th September, 1849 — $1,300 00
Probable amount to be expended by 30th June, 1850 — 1,300 00
No further appropriation asked.

Sea-walls on Deer island, Boston harbor, Massachusetts.—These walls remain in good condition. There is a small unexpended balance of funds in hands of agent, applicable to any repairs that may be required. No appropriation is asked.

Protection of Lovell’s island, Boston harbor, Massachusetts.—The works are in good condition. A small balance of the appropriation is left, applicable to any future improvements or repairs. No appropriation is asked.

Sea-wall on the Great Brewster, Boston harbor, Massachusetts.—Work was commenced upon this wall during the first days of August. By the 30th September, that part intended for the protection of the “south head” was considerably advanced, for 94 feet from the north angle of the wall was completed and copped; and for 50 feet more the foundation courses were laid. In addition to this, a return was built of about 30 feet, at the north end. It is hoped, if storms do not prevent, that, by the close of the season, about two-thirds of this portion will be completed.

The officer in charge asks, for the next fiscal year, $35,000. With this he proposes to complete the two most important parts of the wall. A comparatively small additional appropriation would suffice for any auxiliary works. The Engineer department has, however, asked for a sum considerably smaller.

Balance in the treasury on the 30th September, 1849 — $27,000 00
Probable amount to be expended by 30th June, 1850 — 27,000 00
Estimate of amount required to be appropriated for the fiscal year ending 30th June, 1851 — 15,000 00

Fort Winthrop, Governor’s island, Boston harbor.—The obstacles to the rapid progress of this work have, it is hoped, been removed; and matters are now in train for energetic prosecution. The wharf has been completed; a crane placed thereon; sheds, smithies, and temporary quarters built; scale for weighing stone and sand established. The stone-cutters will be employed during the winter, in force, preparatory to active operations in the spring.

Balance in the treasury on the 30th September, 1849 — $33,500 00
Probable amount to be expended by 30th June, 1850 — 33,500 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 — 10,000 00

Fort Independence, Boston harbor, Massachusetts.—A large amount of asphalt has been laid during the year on the floors of the casemates and communications, amounting to 66 tons of mastic; the carpentry of the soldiers’ barracks, of store-rooms, and bakery, is nearly complete; carpentry of officers’ quarters and magazines about half completed; the two shot-furnaces have been finished.
Fort Warren, Boston harbor, Massachusetts.—The labor of the year has been applied as follows: Continuing and completing the parade wall; building an area-wall along basement of quarters; embanking parapet of main-work and sodding its exterior slope, adjusting ravelin slopes, and making doors, windows, &c., for quarters. The results by measurement are 2,633 cubic yards of masonry, 2,100 square yards of sodding, and 10,000 cubic yards of embankment.

Fort Adames, Newport harbor, Rhode Island.—2,200 cubic yards of masonry have been laid in the permanent wharf, gun-platforms, posterns, and terrace walls. Over 17,000 square feet of stone have been cut; 1,100 square yards of pavement laid; 4,500 square yards of masonry pointed; 2,500 cubic yards of earth removed; 500 cubic yards of embankment formed, and 500 cubic yards of stone quarried. Of the last appropriation, $10,000 were retained for the commencement of permanent quarters.

Fort Griswold, New London harbor, Connecticut.—Nothing has been done at this work during the year except pointing the breast-height walls of the battery.

Fort Trumbull, New London harbor, Connecticut.—Labour during the year has been applied as follows: Building the exterior columbiad battery and grading the ground in its vicinity; completing the asphalting of the casemate roofs; laying pavements; advancing the interior finish of the casemate quarters; completing the pointing of all the masonry; grading parade of the north exterior battery, and advancing many of the minor details of the work.

Fort Schuyler, Long Island sound, New York.—The labor of the year
has been applied as follows: 2,257 square yards of stone flagging in case-
mates, vaults, and galleries; 443 running feet of scarp coping; 1,229
square yards of scarp-wall pointed; 265 cubic yards of masonry; painting
all the wood work of the quarters and gates of the fort; grading the entire
 glacis of the water batteries, and putting up the iron railing of the case-
mate gallery and along the gorge curtain, for a length of 1,006 feet. The
 officer in charge calls for $45,000; but this department feels constrained
to reduce the amount of the estimate as below:

Balance in the treasury on the 30th September, 1849         $3,000 00
Probable amount to be expended by 30th June, 1850          3,000 00
Estimate of amount required to be appropriated for fiscal
year ending 30th June, 1851                                15,000 00

Reparos of Fort Wood, Bedlow's island, New York.—During the year
the operations on this island have been mostly confined to the barracks,
quarters, storehouses, and bakery. Every endeavor has been made to
render the fort habitable by a garrison, in order to meet the urgent wants
of the line of the army; but the work has been materially delayed, first
by the necessity of quartering troops in the barracks while still in an un-
finished state, and afterwards by the occupation of the whole island by
the commissioners of emigration of New York as an hospital during the preva-
gle of the cholera; this occupation lasted four months, during
which time, of course, nothing could be done by this department. In
addition to the accommodations provided for the troops, labor has been
applied to the following objects, viz: excavation of the ditches to an ex-
tent of 7,600 cubic yards; construction of permanent platforms for barbette
guns of the main work, and the advancement of the sea-wall and the ne-
escary embankment in rear of it.

Balance in the treasury on the 30th September, 1849         $6,000 00
Probable amount to be expended by 30th June, 1850          6,000 00
Estimate of amount required to be appropriated for fiscal
year ending 30th June, 1851, including the construction
of a permanent wharf                                       25,000 00

Fort Hamilton, New York harbor.—For two years previous to Septem-
ber 30, 1848, the principal object to be attained in the repairs of this fort
was to secure the casemates from the injury resulting from water filtering
through the masonry of the arches. This object has been accomplished,
and the operations, by which it was secured, terminated in November
last. Since that time, the main objects have been to increase the strength
of the place by establishing additional guns on its land fronts, and to render
the casemates habitable and healthy. Labor has been applied to both
these purposes, and to others subordinate thereto, since the 1st of last
July, at which time the appropriation for these repairs became available.
Before the termination of the working season, the arrangements will be
completed for mounting twenty additional barbette guns on the land fronts
of the fort and on the redoubt. Most of the material for refitting all the
casemates of the east front is purchased; most of the wood-work is got
out and ready to be put up, but funds are wanting to complete this op-
eration; and it will have to be suspended, in view of the greater necessity
of preparing for the armament.
Besides the completion of the repairs, it is proposed, with the funds now asked, to replace the decaying wharf with a new one of stone. The estimate of the officer in charge is $29,500 00.

Balance in the treasury on the 30th September, 1849 $2,000 00
Probable amount to be expended by the 30th June, 1850 2,000 00

Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 $20,000 00

**Repairs of Fort Lafayette, New York harbor.**—During the present working season, two new shot furnaces have been erected and will be completed, the doors of the two magazines have received a protection of masonry, and this arrangement will be completed by the addition of roofs.

Balance in the treasury on the 30th September, 1849 $2,000 00
Probable amount to be expended by 30th June, 1850 2,000 00

No appropriation is asked for next year.

**Repairs of works on Staten island, New York—Fort Richmond.**—During the year the works have progressed steadily and to an extent proportioned to the available means, having resulted in building up the entire scarp of the fort an average height of two feet; all the casemate piers of two fronts; half of the third front and half of the magazines of the gorge front, and average height of three feet or to the level of eleven feet above the foundations, and 240 feet in the length of sea-wall, an average height of nine feet, requiring 946 cubic yards of cut stone masonry, 931 cubic yards of rubble masonry, 507 cubic yards of concrete masonry, 47 cubic yards of brick masonry; the excavation and removal of 2,324 cubic yards of sand; cutting 21,784 cubic feet of stone, and driving 159 piles.

To progress with the construction of this work the next year, the most advantageous sum to be applied thereto would be $75,000, with which one tier of casemates and the countercarp of the gorge front could be built up; thus affording a closed battery flanking the approach to the narrows, ready to receive its armament in case of emergency, without interfering with the further progress of the work. Any sum short of this would be applied to the scarp, piers, and arches of the first tier of casemates and countercarp of the gorge front, in the order specified, and to the extent such sum would permit.

Balance in the treasury on the 30th September, 1849 $14,000 00
Probable amount to be expended by 30th June, 1850 14,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 60,000 00

**Sandy Hook, New York harbor.**—I must again advert to the necessity for the commencement of a fort at this place; and to that end, in a separate communication, the support of the government for this project will be solicited.

**Fort Delaware, Delaware river.**—During the past year the dike surrounding the island has been repaired and strengthened, and the wharves repaired. The excavation for the foundations of the work, commenced in August, 1848, was completed in April, 1849; the entire quantity of earth and old foundation removed being 39,554 cubic yards. On the completion of this, the piling was commenced and carried on as rapidly
as possible. At the close of September last, 4,356 piles had been driven. For the remainder of the piles and the grillage, the available funds will be sufficient and leave a small balance for the temporary buildings needed. To commence the masonry of the work, an additional appropriation is necessary. The officer in charge reports that $200,000 might be economically applied during the next fiscal year; but in view of the other wants of the service, I shall only ask for the amount stated below.

Balance in the treasury on the 30th September, 1849 - $38,000 00
Probable amount to be expended by 30th June, 1850 - 38,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 50,000 00

Fort on Sollers' Point flats, Baltimore harbor.—Since the date of the last annual report the scow, steam pile-driving machine, and lighter for the transportation of heavy bodies, then under construction, have been completed.

The fort has been located on the site designated for its situation, and its trace laid out and marked on the shoal. The nature of the shoal has been ascertained by boring, and a hard foundation found to exist forty-five feet below low-water level. The preparatory platforms or wharves for the construction of sea-walls have been commenced, and 100 running feet of the outer wharf completed. All the piles for the construction of the wharves for two fronts have been procured. A crane for receiving stone and other machinery has been built, ready for erection. A well has been sunk on Sollers' point, 37 feet below the stratum of salt water sand, from which a supply of fresh water is obtained sufficient for the use of the men and steam engines employed on the work, and arrangements made to convey it to the site of the fort.

Balance in the treasury on the 30th September, 1849 - $36,100 00
Probable amount to be expended by 30th June, 1850 - 36,100 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 50,000 00

Fort Madison, Annapolis, Maryland.—Not having an officer available for the superintendence of this work, the whole of the appropriation of last March remains unexpended. No further appropriation now asked.

Repairs of Fort Washington, Maryland.—The repairs of this work are completed, and it has been turned over to the line for occupation.

Fort Monroe, Hampton roads, Virginia.—During the past year the stone revetment of the glacis coupé on front No. 5 has been completed, including a surface of 15,000 feet of masonry, with an average depth of 15 inches. There have been prepared and dressed, besides, over 5,000 superficial feet of stone for the scarp-wall of the redoubt, and 1,500 superficial feet for the tide lock. The slopes of the glacis have in various parts been repaired and adjusted. Materials have been collected for the rapid construction of the redoubt when commenced, and the machinery for pumping put in order.

The officer in charge asks for the next fiscal year $40,233, with which he expects to be able to complete the work, $5,000 of it being intended
for the completion of the artesian well already commenced. But the department has felt obliged to reduce the amount asked for, considerably.

_Mill Creek bridge and road._—This bridge requires to be refloored, and the road leading thereto, from the fort, to be widened and repaired. The estimated amount for these objects is $800.

Balance in the treasury on the 30th September, 1849, on account of Fort Monroe - $11,000 00

Probable amount to be expended by 30th June, 1850 - 11,000 00

Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 20,000 00

_Fort Calhoun, Hampton roads, Virginia._—No work has been done at this fort during the past year. It is expected that the measurements of the present autumn will show such a diminution of subsidence as to justify a recommencement of operations at an early day, in which case it may be necessary to ask for an appropriation. None is asked at present.

_Fort Macon and preservation of its site, Beaufort harbor, North Carolina._—A fort keeper has been employed during the year for the preservation of the public property, but no repairs have been applied. Some will be executed during the coming winter.

The means adopted for the preservation of the site seem to be successful. Some repairs and improvements of the jetties will soon be made, out of funds now available, including the construction of a permanent wharf.

No further appropriation asked.

_Repairs of Fort Caswell and preservation of its site, Smithville, North Carolina._—Nothing has been done on this work beyond the labor of a fort keeper, who has been employed to take care of public property.

For the preservation of the site another jetty is necessary; for this, materials are now in course of collection, and the jetty will probably be finished by the close of the present fiscal year. Part of the available funds will be applied to the wharf, which will be made permanent.

No further appropriation asked.

_Preservation of the site of Fort Moultrie, Charleston, South Carolina._—The breakwater has been extended during the year 497 feet, leaving yet to be completed 360 feet. The finished part of the breakwater effectually protects the shore. It is thus far uninjured by storms. The part of the island not yet protected is wearing away at a rapid rate.

The officer in charge estimates for the completion of the work $3,500, and adds, that "if the appropriation be deferred to another year, this part of the island and the buildings thereon will probably all be carried away."

Balance in the treasury on the 30th September, 1849 - $800 00

Probable amount to be expended by 30th June, 1850 - 800 00

Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 3,500 00

_Dike on Drunken Dick shoal, Charleston harbor, South Carolina._—5,851 tons of granite have been used on the dike since the last annual report. The stones now reach the proposed terminus of the dike. All parts of the work, from that which is completed or nearly so, to that
which is barely raised above the surface of the bottom, are causing a rapid accumulation of sand, and there remains no longer a reasonable doubt that it will fulfill the objects of its construction, viz: the security of Fort Moultrie and Sullivan's island. The superintending engineer demands the sum of $65,000, which has been reduced in the estimates of this department to the same small amount that was appropriated last year.

Balance in the treasury on the 30th September, 1849 - $6,000 00
Probable amount to be expended by 30th June, 1850 - 6,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 10,000 00

Fort Sumter, Charleston harbor, South Carolina.—Since the last annual report the scarp wall of the battery fronts has been raised nearly seven feet, and of the gorge three and a half feet; the piers to the springing lines of the second story casemate arches, except those at the angles, which remain as they were. It has been ascertained that the rate of subsidence of the foundation is decreasing, although under an increasing weight.

The officer in charge estimates for the service of the next year $115,000, but I feel constrained to limit the call of the department to $40,000.

Balance in the treasury on the 30th September, 1849 - $26,500 00
Probable amount to be expended by 30th June, 1850 - 26,500 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 40,000 00

Preservation of the site of Fort Johnson, Charleston harbor, South Carolina.—The wooden revetments erected for the protection of the site of Fort Johnson are so far decayed that a severe storm would certainly carry most of them away, and endanger four public buildings, viz: the soldiers’ quarters, (a large building built of concrete,) the carpenters’ shop, smith shop, and laborers’ quarters, and with them would be washed away a large portion of the sandy foundation on which they stand; and in a few years, if not protected, the remaining buildings and the whole point would share the same fate. This point is important to the defense of Charleston, being capable of mounting more than fifty pieces of artillery, bearing effectively upon the channel. In the hands of an enemy, who might approach it from Stono river by land, it would intercept the direct communication between Fort Sumter and the city, and greatly annoy vessels entering or leaving the harbor. As a site for a general hospital for the garrisons of Fort Sumter and Fort Moultrie it has many advantages, amongst which the ample space and substantial and comfortable buildings belonging to the United States may be mentioned.

The present wooden breakwater will not stand another severe storm, and will not last more than another year, if we should escape our usual equinoctial gale. The present wharf is fast going to decay and will require to be rebuilt soon, or to be repaired at an expense almost equal to the cost of a new one.

Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - $5,000 00

Fort Pulaski, Savannah river, Georgia.—Work was resumed at this fort in December last. The labor of the year has been applied to the follow-
ing objects, viz: enlarging and raising the permanent dikes of the island; grading and adjusting the earthen slopes of the fort; repairing one of the wharves; adjusting gates to feeding canal, and making small repairs.

For the accommodation of a garrison and the preservation of this work, considerable additional labor is required. The exterior buildings should be repaired to fit them for quarters, stores, shops, &c.; the remainder of the dikes enlarged so as to give permanent protection to the island; the masonry pointed; cisterns repaired, with other small repairs and modifications. For these purposes $20,000 will be required. A permanent wharf will also in time be required, to replace the present wooden one.

Balance in the treasury on the 30th September, 1849
Estimate of amount required to be appropriated for the fiscal year ending 30th June, 1851

Repairs of Fort Jackson, Savannah river, Georgia.—The operations at this work were recommenced in November last, and continued until the 1st of June of the present year, when all work was closed on account of the unhealthy locality of the fort. The labor of the year comprises the following objects, viz: excavating for the foundations of scarp walls of land fronts, and establishing the pile and grillage foundations for the same; completing the embankment of parapet on the river fronts; covering the terreplein of water battery with asphaltum; completing the masonry and wood-work of magazine, and covering it with a slate roof; building the scarp of land fronts to the height of ten feet above its foundation; driving the piles for counterscarp of land fronts; embanking a large quantity of earth in filling up the parade; making and putting up the casings to doors and windows of store-rooms and guard-rooms; constructing the necessary machinery and receiving the required materials.

The labor upon this work was resumed on the 1st instant, and with the funds available the remaining portions of counterscarp foundations on the land and river fronts can be established, a part of the counterscarp wall finished, the scarp-wall raised a few feet higher, and the parade filled with earth to its proper level.

Balance in the treasury on the 30th September, 1849
Probable amount to be expended by 30th June, 1850
Estimate of amount required to be appropriated for the fiscal year ending June 30, 1850

Proposed fort at the entrance of Cumberland sound, Georgia.—The repeated efforts of the department during the year to complete the title to the site designed to be occupied for the defence of this entrance have failed, and consequently no labors could be undertaken.

The sum now applicable to such a work will suffice for a beginning; so that no further appropriation is asked at present.

Repairs of sea-wall, St. Augustine, Florida.—The appropriation for this work, made at the last session of Congress, not being available until the 1st of July last, no labor was expended upon it prior to that date. In the course of the summer, arrangements were made for the delivery of the necessary materials, and a portion of the required machinery has been repaired. In the course of the coming winter the repairs of the sea-wall
and battery can be completed; the amount now available for that purpose being probably sufficient.

Balance in the treasury on the 30th September, 1849  -  $4,200 00
Probable amount to be expended by 30th June, 1850  -  4,200 00

Pensacola harbor, Florida.—I beg leave to refer, as containing interesting and important statements, to several previous reports from this office on the general value of this harbor for great national purposes.

Fort McRee and preservation of site, Pensacola harbor, Florida.—The operations for the security of the site of this work have been entirely successful, and the foundations are deemed safe. The funds expended have been applied almost exclusively to this object. For any future operations the funds now applicable are deemed to be sufficient.

Fort Pickens, Pensacola harbor, Florida.—Nothing of consequence has been done for Fort Pickens during the year. A new piazza and some slight repairs are required, and will be provided for out of the fund for contingencies of fortifications.
No appropriation now asked.

Fort Barrancas and barracks thereat, Pensacola harbor, Florida. Redoubt.—Since the last report, the progress on this work has, for want of means, been small.

Barracks.—The masonry of four divisions of the barracks, and four kitchens, is now nearly complete. The lower rooms of the barracks and of two kitchens remain to be paved, as well as the walk in front and the floor of the piazza in rear. The windows of the two centre divisions of the barracks, and of two kitchens, are glazed. The carpenter's work of the interior of the barracks and kitchen has been prepared; a part of it put up, and all the remainder is in readiness to be so. The slaters are now at work on the roofs of two divisions of the barracks, and on those of two kitchens. This work will be completed in a few days.

The foundations of the remaining divisions of the northern wing have been raised to the level of the water table, and the walls of the same will be raised as rapidly as materials can be procured.

The estimate of the officer in charge, for Fort Barrancas, for the permanent barracks, and for the purchase of sundry lots and houses, was, for the next fiscal year $104,876; which the engineer department has felt constrained to reduce to $35,000, including $20,000 for the redoubt, and $15,000 for the barracks, at the Barrancas.

Balance in the treasury on the 30th September, 1849  -  $35,000 00

Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851  -  35,000 00

Fort Morgan, Mobile Point, Alabama.—Since last October the permanent wharf has been completed; the required alterations have been made in the magazines; front No. 4 has been graded and planted with Spanish bayonet; 6,841 cubic yards of sand have been added to the glacis of front No. 5; and the partition walls of the lower story of barracks have been built.
Balance in the treasury on the 30th September, 1849 - $13,252 65
Probable amount to be expended by 30th June, 1850 - $13,252 65
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851, chiefly for the construction of additional barracks - $15,000 00

Proposed new fort on Dauphin island, Mobile bay, Alabama.—No steps which it was in the power of this office to take to complete the title to the land wanted for the site of this work have been omitted; such title is not yet vested in the United States, however, and consequently operations could not be commenced. There is a balance in the treasury of a former grant which will suffice for the commencement of the work.

Fort Pike and preservation of site, Louisiana.—A very small amount of labor has been applied to this work the past year. With the funds now available it is proposed to make sundry additions for the convenient service of the fort and the comfort of the garrison, including considerable addition to the barrack-room, and to apply some repairs.

To complete the proposed improvements, an additional appropriation will be required; which includes some further work for the preservation of the site.

Balance in the treasury on the 30th September, 1849 - $8,500 00
Probable amount to be expended by 30th June, 1850 - $8,500 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - $5,000 00

Fort Wood and preservation of its site, Louisiana.—Some slight repairs have been applied during the year. The available funds will be exhausted in building an additional story to the citadel, barracks, and in other necessary improvements.

We have, besides, to provide by jetties, revetments, &c., for the security of the site, now rapidly encroached upon by the tides; also, to cope the scarp-wall, to construct a bridge over the outer ditch, and to make sundry minor improvements, which require an additional appropriation.

Balance in the treasury on the 30th September, 1849 - $7,500 00
Probable amount to be expended by 30th June, 1850 - $7,500 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - $10,000 00

Battery Bienvenue, Louisiana.—This work has been in charge of a fort keeper during the past year. The officer of engineers in charge reports the necessity of some improvements and repairs requiring a small appropriation, which is accordingly asked.

Balance in the treasury on the 30th September, 1849 - $4,000 00
Estimate of amount required to be appropriated for the fiscal year ending 30th June, 1851 - $4,000 00

Tower Duprés, Louisiana.—This work has been in charge of a fort keeper during the year.

It has become necessary to substitute stone gun-platforms for the existing wooden ones, which are now decaying. To provide for this and the
payment of a fort keeper, and small contingent expenses, an appropriation
is asked.
Balance in the treasury on the 30th September, 1849 - $2,000 00

Proposed tower and battery at Proctor's Landing, Lake Borgne, Lou-
isa.-In reference to this work, I must repeat my statement of last
year, namely, that it is indispensable to the security of New Orleans
that a work be constructed at this position without further delay. A separate
estimate of $50,000 will be handed in, in the hope that it will find favor
with the Executive and Congress.
Several previous reports from this office have urged this necessity at
some length.

Fort Jackson, Mississippi river, Louisiana.—The operations of the year
have been confined to deepening the ditch to an unfordable depth. This
has been accomplished, though the cost of it was considerably increased
by the prevalence of the cholera at the post. An unusually high stage
of water in the Mississippi river has shown the necessity of additional
levees, and the existing appropriations will be absorbed in their construc-
tion and the expenses of fort-keeping.
For the next year the officer in charge estimates for $35,000, to be applied
to the construction of a new exterior battery, to the conversion of part of
the covert-way into an additional water-battery, and to sundry minor im-
provements. I have, however, reduced the estimate nearly one-half.
Balance in the treasury on the 30th September, 1849 - $15,000 00
Probable amount to be expended by 30th June, 1850 - 15,000 00
Estimate of amount required to be appropriated for fiscal
year ending 30th June, 1851 - 20,000 00

Fort St. Philip, Mississippi river, Louisiana.—The labor of the year
has been applied as follows: Constructing a wharf, laying 28 permanent
gun-platforms in lower exterior battery-building, breast-height walls of
this battery and breast-height walls of gorge of upper battery; construct-
ing service magazines for these two batteries; collecting the timber for re-
etting the ditches of both batteries.
To complete the repairs of this fort, the officer in charge estimates an
amount of $60,000; for the next year, however, this department asks for
little more than half of the above sum.
Balance in the treasury on the 30th September, 1849 - $28,000 00
Probable amount to be expended by 30th June, 1850 - 28,000 00
Estimate of amount required to be appropriated for fiscal
year ending 30th June, 1851 - 35,000 00

Fort Livingston, Grand Terre island, Louisiana.—The settlement still
continuing in this work, it has not been judged expedient to complete it
during the past year. A small force has been employed in pointing ma-
sory, and wheeling additional earth on the glacis; and materials have
been collected for completing most of the work now remaining to be done.
It cannot yet be decided whether it will be judicious to go on with the com-
pletion of the work during the ensuing year; but it is believed that it will
not be necessary to delay it much longer. The settlement will not, in any degree, impair the efficiency of the fort.

The amount of work remaining to be done is not great. Completing the breast-height walls, (partially built;) setting gun-traverses, for which the stone is on hand; shaping and sodding the parapets, terrepleins, and glacis; fitting up the casemates, putting up bridge and draw-bridge; and a few other operations of a minor nature.

The temporary quarters also require some repairs to render them available for a garrison, and fences are in the course of construction to enclose them and the necessary grounds.

The balance of existing appropriation will suffice, it is believed, for these objects.

Balance in the treasury on the 30th September, 1849 - $21,961 62
Probable amount to be expended by 30th June, 1850 - 21,961 62

Fortifications at Key West, Florida.—During the past year the foundations of this work have been advanced to the following extent: On the three channel fronts and the southeast gorge bastion, the masonry has been raised to eight feet above the bottom, and on the curtain of the gorge to six feet, excepting an opening in the latter left for the passage of lighters into the interior; 24,700 cubic feet of granite have been laid, and 17,155 cubic feet additional have been received, ready for laying; 5,000 cubic feet of stone, found on the island, have also been worked in.

In addition to this, the breakwater covering the gorge front and its platform, together with the inner platforms on this and on the north and south fronts, have been built during the year.

The officer in charge recommends for the work of the next year the completion of the masonry of the scarp to the level of the first tier of embrasures; the filling of the interior and some accessory work. This would place the work in security from the violent storms that prevail there, and the propriety and ultimate economy of the course cannot be doubted. But it would require an additional appropriation of $100,000; and in view of the wants of other branches of the service, I feel constrained to limit my call to a smaller amount. I shall therefore ask for a smaller sum, and endeavor to effect the desired object as far as practicable with that.

Balance in the treasury on the 30th September, 1849 - $62,000 00
Probable amount to be expended by 30th June, 1850 - 62,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 75,000 00

Fortifications on Garden Key, Tortugas islands, Florida.—The operations here have been confined principally to the counterscarp wall of the work, to finishing the interior of permanent quarters for officers, and to the construction of a permanent cistern to the quarters.

The foundation of the counterscarp wall is laid by means of a coffer-dam, from which the water is pumped out; the depth being from 5 to 8 feet, according to the tide. There has been completed, during the past season, 510 running feet of coffer-dam, either entirely or partially constructed. The whole amount of masonry laid in this wall, during the year, is 1,815 cubic yards; comprising 959 cubic yards of concrete in the foundation, and 571 cubic yards of concrete, and 285 cubic yards of brick.
masonry in the superstructure. The amount of sand excavated for bed of foundation is 973 cubic yards, and has been made at an average depth of 6 1/2 feet below the surface of the water.

Balance in the treasury on the 30th September, 1849 - $37,000 00
Probable amount to be expended by 30th June, 1850 - 37,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 50,000 00

Military stations on the route to Oregon and California.—The first station Fort Kearny, at the head of Grand island, on the Platte river, 310 miles from Fort Leavenworth, by the travelled route.

In the fall of 1848, three temporary buildings were erected for quarters of officers and men (two companies)—a bakery, and stables for the horses of one company each, also temporary; and a large adobe storehouse finished.

During the present season a framed hospital has been erected, containing four rooms below, and two attic rooms; a two-story building for officers’ quarters, containing four rooms in each story, and two attic rooms, is also nearly finished; and a two-story building for soldiers’ quarters is under way, and will be finished before winter.

A good temporary magazine has also been erected, and 100,000 bricks have been burnt.

During the coming year another double block, or two single blocks, of officers’, and another block of soldiers’ quarters, may be erected; but to complete the works with quarters for two companies, another appropriation will be necessary.

The second station has been located 337 miles west of Fort Kearny, on the Laramie river, one mile above its junction with the Platte. The old adobe work called Fort Laramie has been purchased, which has obviated the necessity of wasting time on temporary buildings.

The buildings now under way, and which are expected to be ready for use before winter, are, a two-story block of officers’ quarters, containing 16 rooms; a block of soldiers’ quarters, intended for one company, but which will be occupied by two during the coming winter; a permanent bakery, and two stables for one company each.

The only buildings that can be erected next year, with the means now available, are, another block of officers’ quarters, and a hospital. To complete the post for a garrison of three companies, an additional appropriation is necessary. Indeed, the sum hitherto appropriated, $18,000, would hardly build a range of stables for two light artillery companies at an eastern post.

The events of the last eighteen months have added greatly to the importance of Forts Kearny and Laramie. Nearly 8,000 wagons, 30,000 people, and 80,000 draught animals have passed along this thoroughfare on the way to California, Oregon, and the Salt lake. The engineer officer superintending the erection of the works and buildings reports it as very desirable that all should be finished soon, and without exacting too much labor from the mounted troops, who should be held in readiness for more important duties. He also states his belief, if the requisite appropriations are made early in the next session of Congress, that both works will be finished in 1850.
Balance in the treasury on the 30th September, 1849 - $10,000 00
Balance in hands of the agent - 5,607 22

Probable amount to be expended by the 30th June, 1850 - $15,607 22
Estimate of amount required to be appropriated for the fiscal year ending 30th June, 1851, in order to complete the accommodation and the defences at the two positions mentioned above - 60,000 00

No returns have been received as to works that may be necessary at any more advanced positions.

**Barracks, Quarters, and Hospitals.**

I have to repeat from my report of last year, under this head, that the duty returns upon me of urging upon the favorable consideration of the Executive and Congress some constructions which I deem essential to the defensive system of the Atlantic coast, and also to the comfort, discipline, and health of the garrisons. A general estimate will accordingly be presented for the commencement of permanent barracks on Governor's island, Boston harbor; on Governor's island, New York harbor; for a hospital at Fort Adams, Newport harbor; and for a hospital at Fort Washington.

**Cadet barracks and other permanent buildings at West Point.**—During the past year, that portion of the barracks west of the main entrance has been entirely completed, and it is now occupied by one-half of the corps of cadets. The foundations of the remaining part of the building have been established, and about one-third of the masonry completed; the necessary drains, and one of the out-buildings, also completed, and about 1,000 cubic yards of rock removed, to form the barrack yard.

It is intended to push forward the masonry during the fall and spring, as far as the available funds will justify, and if the necessary appropriation be granted at the coming session of Congress, the entire building may be completed during the winter of 1850-'51.

Economy of construction, the discipline, instruction, and health of the cadets, require the speedy completion of this building.

Balance in the treasury on the 30th September, 1849 - $20,000 00
Probable amount to be expended by 30th June, 1850 - 20,000 00
Estimate of amount required to be appropriated for fiscal year ending 30th June, 1851 - 48,500 00

**For the hospital of enlisted men; for riding hall, and for mess hall.**—The superintendent asks that the appropriated balances of the original estimates may be granted, in order to their completion.

He also asks the sum of $3,000 for the construction of a permanent building for a guardhouse and commissary store—much needed at the post; that sum being for the total cost under the estimate and plan.

The letter of the superintendent, in explanation of his estimates for the above-mentioned buildings, and for the Military Academy generally, accompanies this report.
The board of engineers connected with the system of defence on the Atlantic and Gulf of Mexico frontiers, consisting of Colonel Thayer, Lieutenant Colonel De Russy, Major Delafield, Brevet Colonel Mansfield, and Brevet Colonel Lee, have, at such times as could be spared from the separate duties of their several important trusts, been engaged—

On projects for the defence of New Bedford harbor, Massachusetts;

On projects for the occupation of Sandy Hook, New York harbor;

On projects for the disposition of permanent barracks, quarters, and hospital at Fort Adams, Newport harbor, Rhode Island.

In the months of January, February, and March last, this board examined the coast of Florida from Pensacola (West Florida) round to Cumberland sound, Georgia, with particular reference to the application thereto of the general system of defence; and, under special instructions, moreover, to make the earliest report practicable on the reservations of land they might find it necessary for the government to make for sites of future defences. Their report on these reservations was received in this office on the 19th March last, and forwarded to you the next day, with the request that such direction should be given to their recommendations as to permit the immediate action of the General Land Office; it being stated that the reservations therein proposed were the only ones this department would have occasion to ask, for purposes of defence, on the coast of Florida, and that a previous request for a general reservation of the islands of that coast was consequently withdrawn. The general report of this board on the defences necessary to the Florida coast, was received here on the 5th October, 1849.

While the board was at Fort Adams, Rhode Island, engaged in the particular matter of selecting positions for barracks, quarters, and hospital at that place, it became necessary to detach two of the members, to wit: Major Delafield and Colonel Mansfield, to meet, under your orders, some officers of the navy, at the dry-dock in Brooklyn, and confer with them in relation to matters connected with that important structure. The joint report then made was sent to the Navy Department.

In my last annual report I stated that the Executive having determined on sending a joint board of naval and engineer officers to examine the coast of the United States lying on the Pacific ocean, with a view to reports on the sites proper for naval depots; on the harbors suitable for the accommodation of cruisers, and of vessels engaged in commerce; the defences necessary for these, and on other matters connected with those subjects; a detail of engineer officers had been made accordingly. A subsequent change placed Brevet Colonel J. L. Smith on that board instead of Major Chase—Major Ogden and Lieutenant Leadbetter still remaining members thereof.

The members of this joint commission reached San Francisco early in April last, and, while awaiting at that place the arrival from the Atlantic of the vessel designed to convey them along the coast of California and Oregon, applied themselves, under their instructions, in the explorations of that bay and the neighboring coast. In this labor they were kindly assisted by such means as Commodore Jones could, without danger of losing his men by desertion, supply from his squadron.
Colonel Smith writes, in relation to the difficulty of obtaining necessary assistance for the prosecution of their labors, that it would seem, from experience so far, that labor cannot be engaged in that country except at most extravagant cost, and that a continuance of that state of things would greatly retard the prosecution of the duties of the commission. He, however, thought it reasonable to suppose that the great excitement then existing would not endure for any length of time; and that the accession to the population to be expected from the arrival of a large number of passengers known to be on the way, would greatly abate, if not entirely allay it.

The commission would keep itself ready to take advantage of any opportunity that might be afforded them for performing their duties.

I have, in two preceding annual reports, stated the probable necessity, in case of proceeding with a system of permanent defences on the Pacific coast, of relying, for the greater part, upon an organized battalion of engineer soldiers for the execution of the works. That this would be the only certain, and by far the most economical means, as heretofore suggested on the representation of Captain Halleck, of the corps of engineers—an officer perfectly acquainted with the whole of that frontier—is likely to be fully shown by further reports from the above-mentioned commission, which has been instructed to examine and report particularly on the subject.

MILITARY ACADEMY.

I have the pleasure to transmit herewith the report of the board of visitors that was assembled at West Point during the general examination in June last, with all the papers by which it was accompanied. A perusal of the general report, and of the several subordinate reports furnished by the committees on instruction, administration, police, discipline, and fiscal affairs, will afford a clear view of the institution, as presented to these intelligent gentlemen after a minute and thorough investigation of its affairs.

Since the visit of the board, and having had before you their opinions, you have yourself had an opportunity to see something of the establishment, and of the ordinary routine of academical duties; and being thus informed as to the actual state of the academy, you will hardly desire that I should occupy your time by details in relation to an inspection made by me in the early part of October. As to which, however, I will state, in general terms, that I found all things proceeding harmoniously and successfully under the same able supervision and instruction that have for several years sustained the high character of the institution.

The several recommendations made by the board of visitors, with a view to improvements of various kinds, will receive the most careful consideration on the part of the authorities. Those, in particular, on the subject of supplies to cadets of food and other articles may, perhaps, lead to modifications that will lessen their cost to the cadets.

The estimate of the expenses of the Military Academy for the next fiscal year, handed in by the superintendent, is as follows, with the exception of an item of $8,000 for the completion of the riding hall, which has been stricken out by direction.
For current and ordinary expenses             $28,884 00
For gradual increase, and for the expenses of the library             1,000 00
For expenses of the board of visitors, including $517 47 for deficiencies of appropriations for the last fiscal year             2,517 47
To complete hospital for enlisted men             2,000 00
To complete mess hall             25,000 00
For a permanent guard-house and commissary store             3,000 00
To which the department adds for completion of cadet barracks             48,500 00

Total             $110,901 47

The following is a list of the officers, professors, and teachers of the Military Academy, constituting the academical and military staff on the 30th of September last:

Captain Henry Brewerton, corps of engineers, superintendent and commandant.

Mr. Dennis H. Mahan, A. M., professor of civil and military engineering.

Second Lieutenant Henry L. Eustis, corps of engineers, assistant professor of civil and military engineering.

Second Lieutenant Charles S. Stewart, corps of engineers, acting assistant professor of civil and military engineering.

Mr. William H. C. Bartlett, A. M., professor of natural and experimental philosophy.

First Lieutenant Joseph J. Reynolds, 3d artillery, assistant professor of natural and experimental philosophy.

First Lieutenant Daniel T. Van Buren, 2d artillery, acting assistant professor of natural and experimental philosophy.

Second Lieutenant and Brevet First Lieutenant William B. Franklin, topographical engineers, acting assistant professor of natural and experimental philosophy.

Brevet Second Lieutenant William P. Troubridge, corps of engineers, on duty in the observatory.

Mr. Albert E. Church, A. M., professor of mathematics.

First Lieutenant Samuel Jones, 1st artillery, assistant professor of mathematics.

First Lieutenant Asher R. Eddy, 1st artillery, acting assistant professor of mathematics.


Second Lieutenant John C. Clark, 4th artillery, acting assistant professor of mathematics.

Mr. Jacob W. Bailey, A. M., professor of chemistry, mineralogy, and geology.
First Lieutenant Francis N. Clarke, 4th artillery, assistant professor of chemistry, mineralogy, and geology.

First Lieutenant and Brevet Captain E. C. Boynton, 1st artillery, acting assistant professor of chemistry, mineralogy, and geology.

Reverend William T. Sprole, chaplain and professor of ethics.

Second Lieutenant George Deshon; ordnance, assistant professor of ethics.

Second Lieutenant and Brevet First Lieutenant Dabney H. Mowry, mounted riflemen, acting assistant professor of ethics.

Mr. Robert W. Wier, N. A., professor of drawing.

First Lieutenant Richard S. Smith, 4th artillery, assistant professor of drawing.

Second Lieutenant James W. Abert, topographical engineers, acting assistant professor of drawing.

Captain George W. Cullum, corps of engineers, instructor of practical engineering.

Second Lieutenant and Brevet Captain George B. McClellan, corps of engineers, assistant instructor of practical engineering.

Brevet Second Lieutenant James C. Dwayne, corps of engineers, assistant instructor of practical engineering.

Brevet Second Lieutenant Rufus A. Roys, corps of engineers, assistant instructor of practical engineering.

Mr. H. R. Agnel, professor of the French language.

First Lieutenant T. D'Oremieux, 1st infantry, assistant professor of the French language.

First Lieutenant John H. Greau, 4th artillery, acting assistant professor of the French language.

Captain Bradford R. Alden, 4th infantry, commandant of cadets, and instructor of infantry tactics.

First Lieutenant John M. Jones, 7th infantry, assistant instructor of infantry tactics.

Second Lieutenant Charles T. Baker, 6th infantry, assistant instructor of infantry tactics.

Second Lieutenant Simon B. Buckner, 6th infantry, assistant instructor of infantry tactics.

Second Lieutenant and Brevet First Lieutenant Henry B. Clitz, 3d infantry, assistant instructor of infantry tactics.

Captain and Brevet Major William H. Shover, 3d artillery, instructor of artillery and cavalry, and commandant of artillery and dragoon detachments.

First Lieutenant and Brevet Major Fitz John Porter, 4th artillery, assistant instructor of artillery.

Second Lieutenant and Brevet First Lieutenant James M. Hawes, 2d dragoons, assistant instructor of cavalry.

Mr. P. De Janon, instructor of the sword exercise.

Military Staff.

Dr. John M. Cuyler, M. D., surgeon.

Dr. Robert Southgate, M. D., assistant surgeon.

First Lieutenant Isaac S. K. Reeves, 1st artillery, adjutant.

Second Lieutenant Barton S. Alexander, corps of engineers, treasurer, and superintending the construction of cadet barracks.
I have here to offer an earnest recommendation that the professor of drawing and the professor of French may be put on the same ground, in respect to allowances, as the professors of engineering, mathematics, ethics, and chemistry. The first-mentioned gentlemen have very laborious and responsible duties; they have shown themselves to be of pre-eminent ability; they have had long experience; and in a long course of service at the academy, have displayed the greatest zeal and industry in their respective departments; and I know no reason why they should not enjoy the same remuneration that is allowed to other academical officers of the same denomination.

For like reasons, the principal assistant professors of French and of drawing should be placed on an equality with other principal assistant professors.

I have once more to urge that the adjutant of the Military Academy may have the same allowances as an adjutant of a regiment of dragoons; and on this point beg leave to refer to a letter from the superintendent to General Haralson, president of the board of visitors, dated June 12, 1847. (See page 613 of papers accompanying the Secretary of War's report, December, 1847.)

OFFICERS OF THE CORPS OF ENGINEERS AND THE COMPANY OF ENGINEER SOLDIERS.

The employment of the officers of engineers during the past year may be stated as follows:

In the office of the engineer department - - 2
Engaged in the construction and repair of fortifications and works connected therewith, 24 officers, acting as principals, and 6 officers as assistants merely - - 30
On the coast of the Pacific, as members of a joint military and naval board required to report on the necessary defences, depots, &c., of that coast - - 3
On detached duty in the military departments, under the orders of the commandants thereof - - 4
On the coast survey, - - 1
At West Point, either on duty in the Military Academy, or in the company of engineer soldiers - - 9

Total - - 49 officers.

Of the thirty officers engaged in the construction or repair of fortifications, it should be stated that five, in addition to those employments, are charged with the duties of the board of engineers; and, as such board, are engaged on the general subject of the defences on the Atlantic coast.

In speaking, at the opening of this report, of the progress of the system of defence during the year, and praising, as I could not do too highly, the devotion and ability of the officers, I alluded to a deficiency in the number of officers for the proper execution of the labors committed to the corps; and to this point it is my duty now to revert more in detail. This deficiency has been the more sensibly felt, from the late extension of our geographical limits; and it must be more and more so, as population and the business and enterprise of the country shall spread themselves out toward the new borders.
There has been an addition of about four hundred miles to our coast upon the gulf of Mexico within a few years, including a number of ports, to the defence of which Congress must soon be called to assign a fair portion of the public treasure.

Upon the Pacific we have, within a still more recent period, acquired an extent of seaboard equal to the whole seacoast of the old thirteen States, comprising several harbors which demand protection at the earliest day practicable. Their distance from the seat of population and strength, exposing them, in a particular manner, to become the objects of an enemy's enterprises, will require that they should possess within themselves the means of protracted resistance. To our commerce in that sea, likely to be vastly expanded within a brief period, there can be no other refuge, at the breaking out of a war, than these harbors properly fortified. Our military posts upon these shores, never likely to be kept during peace upon a strong footing, must have the means of maintaining themselves, and affording something like protection to the settlements till reinforcements can reach them; and the naval forces that may be cruising in that sea at the opening of a war will not probably be of strength adequate to protect the depots and other establishments that the necessities and economy of that service shall have planted there; but, on the contrary, may be so comparatively weak as to be themselves, or some of them, in need of shelter.

Even the completion of the great railway by which some persons hope, at an early day, to open a quick communication with that coast, will augment the importance and necessity of such defences. How completely would all the speculations that rest on this becoming the channel of great trade with the East, be frustrated by the harbors of that coast being occupied by an enemy's squadrons! The contemplated railroad would be an important auxiliary to such defences, greatly increasing their strength and their utility; but without the safe use of these harbors, it could maintain no connexion with the commerce of that sea in time of war. This is not the place, however, to discuss this subject generally; and the preceding remarks on the defences needed on the Pacific, have been made merely to show that it will soon be necessary to detach a considerable number of engineer officers, to be employed there as a board of engineers, and as constructing officers.

Of the officers of engineers (about thirty) now engaged in constructions, five, being officers of rank, have, as before stated, additional duties to perform as members of the board of engineers; nineteen of the superintending engineers have no officers serving with them as assistants; and it has not been possible, for some time past, to give to any of the remaining superintendents, no matter how large and important their works, more than one assistant each. This deficiency of officers is a great detriment to the public interest, because the quality and the quantity of work performed will always depend on the constancy of supervision. The superintending engineer officer is by law the disbursing agent also, and is held accountable for the nature and extent of the expenditures, and for the safety of the public funds. This pecuniary responsibility encroaches sensibly on his time, leaving less of his personal attention applicable to the labors of supervision, and constraining a greater reliance on hired persons over whom, from the nature of things, he can have no control that may not be shaken off by the employee at any moment of pique or caprice. Whenever character and qualifications justify, in a degree, the trust the
superintendent is obliged to repose in such subordinates, a high compensation has to be paid, often much greater than the public allowances to such grades of officers as would be employed as assistants; so that, besides the chances of incompetency, and the want of guaranties as to fidelity, a real extravagance must attend this kind of aid, compared with the expense of maintaining the same number of officers.

Many of the superintending engineer officers, to whom it has been impossible to assign any assistants, have charge, each, of several independent works, in some cases several miles apart; in some cases, separated by hundreds of miles. In all these, it is unavoidable that important public interests are left in the hands of persons without official accountability, and who can be subjected to occasional visits and inspections only. It cannot be necessary to insist on the disadvantages of such a practice.

It seems to be indispensable to a good and responsible supervision, that at each work where the expenditures are more than very moderate, there should be constantly one officer of engineers, at least: if there be any exception to this rule, it would be only where two or three works are in close proximity, so that all may be seen to during the day. In every work of magnitude, or where the daily expenditure has been considerable, experience has shown it to be indispensable to an effective supervision, that there should be, besides the superintending officer, not less than one assistant. Reckoning on these rules, taken at their minimum, and without supposing any works added to those now actually under way, I find twenty additional officers necessary, at this moment, to their proper and economical execution. It is true that some of these works will pass out of our hands, but only to be replaced by others: two or three new ones are even now authorized, for which no officer can yet be spared; and there is good reason to suppose that the approaching session will authorize some others of great importance to the security of the coast, as has been before represented. In making this calculation, moreover, I refer only to the portions of the coast of the United States heretofore included in the system of defence. All that shall be added to the duties of the corps of engineers in consequence of the new acquisitions of territory, will increase the necessities of the corps in respect to an accession to its numbers.

It is an important remark to make here that this deficiency involves, inevitably, the employment as superintendents of important and expensive operations, officers who, however proficient in the studies of their profession, have not had the experience in constructions and in out-door business that should precede such responsibilities.

I could add many forcible considerations to those above presented, if I thought they could be necessary. There is one point, however, not yet touched, which is important, and the force of which makes an immediate commencement of the plan of increase requisite: it is this—that an increase of the corps will not be attended with the desired advantages, unless it be made gradually, and by annual additions of a limited number of officers of the lowest grade from graduates of the Military Academy. The law should do three things. It should insist on all the additions being made to the foot of the corps from graduates of the academy. It should restrict the number of additions to be made annually, and it should restrict the promotions within the corps in a corresponding degree. A good selection of officers would thus be secured, and a proper experience would precede
advancement to the higher grades. By this process, and at a very small annual cost, since all the additions would be made from officers who would otherwise be appointed as brevet second lieutenants into some other corps, it would require from four to six years to fill up the corps of engineers to the extent demanded by the wants of the service.

The company of engineer soldiers (sappers, miners, and pontoniers) has during the year, under the careful drill and instruction of its able and zealous officers, diligently applied itself to the special exercises of this branch of the military force.

The company has not, however, yet had much time to perfect itself therein. Sent a few months after the first enlistments, and while yet but partially instructed except as infantry, into the war of Mexico, although much distinguished for its bravery and good conduct on all occasions, it had few opportunities to display its appropriate characteristics; in those that presented themselves, however, the great value of even the small amount of technical instruction it had received was very apparent. Since its return to West Point, its numbers have been gradually filled up; and having been carefully drilled and instructed, the company shows a proficiency and a soldier-like deportment, creditable alike to officers, non-commissioned officers, and men.

In addition to daily infantry drills, the company has, during the milder season, been much practised in preparing materials for, and executing various kinds of trenches, saps and other field works, and in laying pontoon bridges.

Every year, while the cadets of the Military Academy are encamped, it is intended that they shall witness the field labors of the engineer soldiers, and, to a certain extent, participate in them, as being the only means of giving them practical information in military field engineering. And this course was, as far as practicable, adopted last summer.

As this sapper, miner, and pontonier force is new to our service, I may be excused for a remark or two in relation to it, which I shall endeavor to make very brief.

Besides thorough instruction as infantry and light infantry soldiers, which the engineer soldier needs in order to his efficiency when serving in the line of battle, he has a great deal to learn that is peculiar to his arm. He has to lay and take up ponton and other temporary bridges; to form rafts and to provide or prepare, according to the occasion, all other means of crossing streams. He has to remove obstacles from the path of the army when advancing, and to create and arrange them upon its rear when in retreat; to construct batteries, trenches, and intrenchments; to remove or overcome obstacles in assault, piercing through walls, breaking open gates, scaling ramparts; to plant mines for the overthrow of the enemy's defences, and counter-mines for the protection of his own. He has to labor with his own hands at all such operations, at one moment; at another, to assist in directing the similar labors of thousands.

There is a proper, an expeditious, and a certain manner adapted, moreover, to the means at hand, of executing every such military operation, and it is the function of the sapper, miner, and pontonier to understand and to practise them all.

As the occasions for these operations are constantly recurring in the course of a war, the army of every nation having any experience in war has a portion of this special force, which, as it demands a more varied and
lengthened course of instruction than any other part of the military force; diligent care is taken to train during peace. Equal forecast on our part will cause, at an early day, a material augmentation of our roll of sappers, miners, and pontoniers, because time is indispensable to their formation; and in case of war, every division should be supplied with a number not less than one whole company, thoroughly instructed. It will do little good to add, under that denomination, a company of raw recruits. Under the strongest conviction of this necessity, I trust soon to see at least three companies added to the present one, as has been heretofore recommended.

It may be said of this description of force, that though it will have frequent occasion to co-operate with every other arm of service, it can in no case, either in peace or war, interfere with any. Its functions are of a nature never likely to be assumed by the other arms, because no other could properly execute them, without first going through a special and protracted course of instruction totally different from their own—without, in fact, learning a new and difficult art.

I append to this communication a report from Lieutenant W. H. C. Whiting, of the engineers, on a reconnaissance of a new route from San Antonio de Bexar to El Paso, accompanied by a sketch.

I have the honor to be, very respectfully, your most obedient,

JOS. G. TOTTEN,

Brevet Brigadier General and Chief Engineer.

Hon. Geo. W. Crawford,

Secretary of War.

REPORT OF THE BOARD OF VISITORS OF THE MILITARY ACADEMY AT WEST POINT, 1849.

West Point, June 18, 1849.

Sir: The undersigned, the board of visitors invited to attend the examination of the cadets of the Military Academy, commencing on the first Monday of the present month; and to take into consideration the various matters suggested in your letter of invitation, met at this place at the time appointed; and, having performed the duties devolving on them, make the following report:

The object of the institution being the education of young men, with a view to their becoming officers in the different arms of the military service of the country, the effort of the board has been to ascertain whether this was accomplished in the manner designed by government; whether the system pursued for the purpose was a proper one; and if so, whether anything was wanting to make it more efficient and available.

The education of the cadets is of two kinds—scientific and military. In some arms of the service both of these are directly brought into requisition; in all arms the union of the two may become valuable and important. The same course of study, therefore, is pursued by all the pupils of the institution; and those who cannot, from want of capacity, or will not, from negligence, attain the excellence in their respective studies which has been fixed upon as the standard, are dismissed from the academy, as their deficiency is from time to time ascertained. But as the degrees of excellence must be as various as there are individuals who accomplish the course prescribed, the opportunity is always afforded, in the
distribution of a graduating class among the different arms of the service, of giving to each the individuals whose acquirements are peculiarly adapted to it. A system of rewards is thus created, under whose strong influences the pupil finds himself from the time he enters the academy until he receives his promotion. A better system could not well be devised, or one more likely to produce constant exertion, either to attain an honorable position or to avoid a dismissal, which, however mild may be its form, must be, at all events, an unpleasant memory, if not an obstacle to success, in after life.

This possibility of dismissal scarcely seems to be sufficiently considered by those upon whom the appointment of cadets depends; and young men are too often sent to the academy who are so totally unfit as to make it a cruelty to subject them to the course of study necessary to qualify them to enter any one corps in the army. Sometimes they are dismissed at once; sometimes they struggle on, year after year, only to be dismissed at last, and after they have acquired habits inconsistent with the pursuits of civil life. Sometimes after dismissal they are returned to the academy by superior authority, only to be dismissed again. Sometimes this occurs more than once in the case of the same individual; and last the army may receive an officer whose ignorance or insubordination as a cadet has furnished ample proof of his want of ability to command with intelligence or success.

These considerations have suggested to the board to recommend thus prominently in their report, greater care in the bestowal of appointments than has heretofore in all cases been observed, as well to save the cadet from mortification and injury, as the government from discredit and loss; and especially to urge, as vital to the well-being of the institution, that the sentences of dismissal pronounced at the academy should be considered as final and conclusive, unless upon the clearest and most satisfactory evidence that gross wrong has been done to the individual. Unless this last recommendation should be acted upon uniformly, there is much reason to fear that all the salutary influences of a rigid discipline will be lost to the institution, and the authority of the academic board grow into a matter of contempt.

The board have attended regularly the examination of the cadets in their respective studies from day to day, and have compared the impression made by their several performances with the record showing their standing from week to week during the term. They have also, as far as they have deemed it necessary, by a change of propositions and the suggestion of incidental questions, tested the character of the examination, and have come unhasteningly to the conclusion that the method of instruction is admirable and the instruction itself most thorough and full. To pass the examination at West Point, the cadet must understand what has been taught him. No exercise here can be committed to memory and glibly parroted as a string of words. The commendations of the board, thus cheerfully expressed, are not due merely to the smooth recitations of the cadets, or any of them, who were examined before them. On the contrary, it more frequently happened that the most satisfactory examination was one where the individual hesitated at first, and perhaps throughout, but who finally and slowly came to the correct conclusion, as he stood before the board, by the strong and concentrated mental effort which he
was most evidently making, not to remember words, but to collate ideas whose comparison and adjustment would bring him to the right results.

The board are quite aware that a single examination can afford but imperfect means for ascertaining the proficiency of any one individual examined, and that the determination of this must necessarily be left to the judgment of the academic board. But no such difficulty exists in forming a judgment of the merit of the professor, whose examination of his pupils continues from day to day in the presence of the board, who are thus enabled to see the extent of his knowledge, his facility in imparting it, and his manner and his temper in performing the duties of an instructor; and when the board have observed that the dull have caused no impatience, that the inaccurate have not been permitted to slur their ignorance, and that the intelligent and quick, while they have been tested by varying questionings, have been treated with no more consideration than the heaviest scholars in the class, they would be withholding the meed of a just praise if they did not, on this occasion, commend in the highest terms the professors whose classes have been examined before the board.

There is one matter, however, which, in the opinion of the board, is not as it should be, and which might be considered as almost a characteristic of the examination. They refer to the indistinct utterance of the cadets. They stood with the erectness, firmness, and respect of soldiers; with what, indeed, might generally be called a gallant bearing; while in too many instances they spoke, even when they were most familiar with the subject, in a manner almost inarticulate; so that it was necessary for their instructor to tell those to "speak out" who were shortly to be called to command men in situations where the tone of the voice would be one of the most potent means of inspiring confidence. To these remarks the board are glad to say there were many exceptions, which of itself induces the board to believe that, if a clear and distinct utterance is made a part of the instruction which a cadet receives, along with his mathematics or philosophy, these exceptions will become in a little while the general rule of the institution.

The board see no reason to recommend any other change in the course of study than that of substituting physiology for logic, as recommended in the report of the committee on instruction, and for the reasons there given at length. That the cadets should have been able to pass the examination which they did in pure logic, was most creditable to them and their instructors. But useless, or comparatively useless knowledge, may be ably taught and thoroughly acquired; and the board cannot help thinking that logic falls into this category, as regards young men whose powers of close reasoning would seem to have been improved by other studies, taught as mathematics and natural philosophy are taught at the Military Academy.

Among other matters which have been suggested to the board for consideration has been the expediency of increasing the length of the term of instruction at West Point to five years, which would be adding a year to the time which is now required to complete the course. The great argument in favor of such an addition, should exist in the fact that so many of the cadets come to the academy wholly unprepared to commence the present course of studies. To such, the additional year would afford an opportunity of properly qualifying themselves for admission into the present fourth class. But then, to those who are qualified before their ap-
pointment, this year would be a total loss; perhaps worse than a mere loss of time in the idle habits which it might establish. If it were attempted to obviate this difficulty, by leaving it to the academic board, upon an examination of the new cadet, to determine whether he should enter the fourth or the fifth class, then the number of the fifth class, the extent of accommodations required for them, the teachers necessary to instruct them, would be so uncertain as to make provision for the class, in these particulars, a matter of difficulty, involving an expense greater perhaps than the object in view might justify. The board are also aware that the additional year has been looked upon as permitting additions to the present course rather than as facilitating the preparation of cadets to commence it. Still, in neither view of the case do the board feel quite prepared to recommend it; and while they are ready to admit that much may be said in its favor, and while they express their views on the subject with diffidence, they nevertheless would prefer that, for the present at least, there should be no change in this respect. They would rather rely upon the strictness of the examinations, and especially the January one of the first year, as recommended by the committee on administration, to obviate, both as regards the individual and the country, the difficulty growing out of an imperfect preparation for the course pursued here. The recommendation of the committee on administration, that the academic board should dismiss, whenever in their judgment it might be necessary, as well at the January as the June examination of all the classes, is fully approved by the undersigned. The practice now, except in the case of the fourth class, is to dismiss at the June examination only, which leads too often, as explained by the committee, to carelessness on the part of the cadet for the first six months of his second, third, and fourth year's courses, in the expectation that, by dint of extra exertion, he will be able to retrieve himself in the second six months. In other words, the preparations, in the opinion of the board, for the January as well as for the June examinations, should be made under the salutary apprehension of dismissal in the event of failure.

Again, and in conclusion of this part of their report, the board cordially adopt the recommendation of the committee on instruction, that the duties at present performed by the chaplain, and which include not only ethics, which are peculiarly appropriate to his sphere and calling, but also constitutional and international law, should be divided, and the two latter given to a separate professor, whose previous studies and other qualifications might fit him for the place. Under such a person the course of law might be extended, so as to embrace the rules of evidence and matters relating to courts martial, without materially trenching upon the time now given to other studies.

The military education of the cadets appeared to the board to have been well attended to; and they derived great gratification from their drill as infantry, cavalry, light artillery, and heavy artillery. Their instruction in all matters peculiarly connected with their future calling seemed in every respect satisfactory; and it gave the board great pleasure to observe that all this proficiency had been obtained while the cadets were at the same time acquiring, in an admirable manner, the best scientific education that our country can afford. Indeed, the bodily exercise of the one seemed to accord well with the mental labors of the other, counteracting the evil consequences to health which the sedentary life of a mere student
generally gives rise to—the result being an appearance of strength and activity surpassing, or at least equalling, the most favorable anticipations of the board.

It has been suggested to the board that more attention should be paid to particular arms of the service in the military education of the cadets; but the board see difficulties in the way of recommending any change in the existing state of things in this respect. They would recommend, however, that all the *materiel* required for their instruction as they are now taught should be put upon the best footing, so that every weapon and muniment of war should be of the best kind and kept up with the very latest improvements. The combination of scientific with military studies and exercises in such just proportions that neither would interfere with the other, and that the result should be the well-educated soldier which West Point now produces, has doubtless been a matter of difficult adjustment, and the board would be unwilling to recommend, even by way of experiment, anything that might, by possibility, interfere with what seems already so well ordered.

There is, nevertheless, a deficiency in the means of military instruction which was most apparent to the board. The number of horses is quite insufficient, and their character is far from what it should be. Of the forty horses with which the cavalry and light artillery exercises were performed, thirty at the time been condemned; and although their places were to be supplied by others, as the board understood, yet it was evident that the more judicious course would have been to supply the place of a defective horse by a good one whenever it was necessary, instead of waiting until such numbers of them became disabled. Involving, as this matter does, and as the board themselves saw that it did, the lives of the cadets, they would be remiss in their duty if they did not press it upon your consideration. The number of horses should be so increased that it should be unnecessary to use at any time a weak or inefficient animal in the cavalry or artillery exercise of the cadets. For this purpose it has been suggested that eighty or one hundred horses would be necessary.

In connexion with the scientific and military education of the cadets, the board have considered their discipline. The report of the committee on discipline is so full that it is unnecessary to do more in this place than to refer to it for all the details connected with the subject. As there stated, the cadets are divided into four companies of infantry, forming a battalion, with the proper officers: each company having its captain, subalterns, and non-commissioned officers, and the whole being under the charge of an officer of the army, whose title is the commandant of cadets, with four assistants taken from the line. The government is of course a military one. Minor offences are punished by the superintendent by confinement to quarters, extra guard duty, reprimand, &c.; graver ones are tried by courts martial—the highest punishment being that of dismissal from the academy. There is also a system of punishment which consists in what are termed demerit marks, varying in number according to the nature of the offence; the sum of which is taken into consideration on determining the situation, at the annual examination, which a cadet shall occupy in his class; so that, to hold the highest place, the individual must combine subordination and good conduct with talent and industry. The board have every reason to believe
that the government of the cadets, so far as it depends upon the officers
of the institution, is kind and just; and that the necessary severity of
military discipline is properly tempered in the hands which are here in-
trusted with its administration. The system in this respect presents no-	hing which the board would desire to see changed. On the contrary, they
would take this occasion to reiterate what they have already said in re-
gard to the necessity of maintaining the authority of the academic board
at West Point, by respecting, except for very weighty considerations, the
sentences of dismissal which are pronounced here.

The general administration of affairs at West Point has been examined
by the board with particular attention; and for all matters of detail con-
ected with it, such as the organization of the academic board, the number
of professors and assistants, as well as for suggestions in regard to
certain alterations, the board refer to the report of the committee on
administration, which will be found in the appendix. In what they have
already said, the board have testified their sense of the kindness, justice,
and ability with which the affairs of the Military Academy are adminis-
tered; and it is only necessary to add, on this point, that they fully accord
with what the committee has said upon the subject.

There are, however, some matters to which the board have thought it
proper to call your particular attention. These relate to the manner in
which the cadets are supplied with board and necessaries. Under the
present system, there is a purveyor who receives a regular salary, and
whose business it is to buy whatever may be required for the mess-house,
see to its proper preparation, control the waiters, laundresses, &c.; and,
in fact, attend to all matters connected with this part of the establish-
ment. The amount expended by him is ascertained every two months,
credit is given for whatever may have been sold, such as offal, &c., and
the balance is charged to the cadets; whose board accordingly varies with
the markets from time to time; the average being about nine dollars per
month. From the very minute investigations that have been made into
this subject, by a committee of the board, there is some reason to believe
that this average may be sufficiently reduced to justify the experiment of
a change in the present system—not that the board would be understood
to doubt the propriety of the purveyor's conduct in the responsible posi-
tion which he holds; but the present system is itself an improvement,
and a very great one too, on that which preceded it, and the board see no
reason to think that the minimum cost of supplying the cadets, with a
fare equal in all respects to that which they now have, has been attained.
The change which they would recommend would be the employment
here of a commissary, an officer of the army, who should have the whole
matter in charge, with such assistance as might be necessary for the pro-
per management of the mess-house. The board believe that, in this
way, the expenses of the mess-house may be brought more nearly on a
par with similar expenses in many of our colleges. The board are aware
that there is a difference of opinion on this subject. They hold, how-
ever, that the experiment which they now recommend is worth the
making.

In like manner, the board would recommend a change in the mode
adopted for supplying the cadets with such necessaries as they from time
to time require. At present there is a single store on the Point, the prices
of which are regulated by the council of administration, who, upon the
production of the storekeeper's invoices, add to them such profit as they deem reasonable, and he makes his charges accordingly. This seems perfectly fair, and in accordance with the general army regulations on the subject. But there is no reason why the cadets should pay this profit. They now obtain their clothing at the cost of making it. The materials are purchased by the quantity, of the best sort; the expense of the manufacture is added; and the cadet is clothed, as he should be, at prime cost of the article. There is no reason why the same system should not be pursued in regard to the few articles (comparatively speaking) other than clothing, which the cadet now purchases from the store, and for which he must have the previous order of the superintendent. The present storekeeper has been here many years, and, from all the board can learn, is a worthy and estimable man, in whom all reliance can be placed. But the reasons for the present recommendation are independent wholly of the individual.

In connexion somewhat with this part of the subject, and as materially affected by what has just been spoken of, the board, with a single exception, would recommend an increase of the pay of the cadets. They believe that, with the strictest economy, the present pay is not sufficient for their support. Those who have friends at home who can assist them do not feel this as those do who have nothing but their pay to feed and clothe them. That all may be on an equality, the pay should be increased. If it is not, West Point will remain an institution of a republican government, maintained at the public expense for the public good, where the boundaries of wealth are clearly and painfully drawn, and where the poor man's son, whatever may be his talent, whatever may be his future usefulness to his country, is subjected to constant mortification, and is daily made to feel that, in contradiction of the theory of his government, its practice is to permit distinctions, for the sake of an unwise parsimony, between the different classes of its citizens and their children.

The pay of the cadets amounted formerly to $28.20 per month. A few years since it was reduced to $24. The board recommend that it be raised to what it was formerly. They have examined the expenditures of the cadets; (it being easy to do so under the admirable system which exists in regard to them,) and they find that, after they have paid the two dollars per month which is required as a contribution to a fund for their equipment after graduation—a sound and wise provision—there does not remain sufficient for their decent support. True, matters would be better with them if the boarding were reduced and their purchases at the store cost less; but no probable reduction would suffice to make their present pay equal to their necessary wants.

In connexion with this part of their report, the board of visitors would reiterate the recommendation made by their predecessors in their report of June, 1848, that the pay of the superintendent be made that of a colonel of engineers. At this time it is the pay due to the rank of the officer in command. The present incumbent being a captain only, his pay is less than that of his subordinates—the professors and the commandant of cadets. His position as the head of the institution subjects him to charges from which, upon other duty, he would be exempt, and which, in the opinion of the board, the pay of a captain is inadequate to meet.

The board have carefully examined the old and the new barracks for
the cadets. The first are utterly unfit for occupation, and but one-half of the new barracks has been completed. It is unnecessary for the board to dwell upon the necessity of finishing the latter at the earliest day, for everything is being done, and well done, to this end; but they cannot refrain from expressing their satisfaction at the present escape of a part and the prospective escape of the entire corps from quarters which have for years been evidently in no condition for use.

The new barracks, the board are glad to say, are everything that could be desired, the arrangement being in all respects perfect, and the execution of the work itself being such as was to have been expected from the intelligence that has directed and superintended it.

Immediately in front of the new barracks stands the old mess-house, an unsightly edifice, very ill adapted to the purposes to which it is applied. This, however, is to be removed, and a new mess-house, in a more eligible situation, erected in its stead. When this shall be done, and the present building torn down, along with the old north and south barracks, and a new riding and drill house erected, for all which appropriations have been made in whole or in part, the accommodations of the academy may be considered as completed, for the first time, in a proper manner. For a more detailed account of the new barracks and the objections to the old ones, the board refer to the report of the committee on police, which will be found in the appendix.

As already mentioned in a previous part of this report, the board have been struck with the healthy appearance generally of the cadets. In connexion with this, they have carefully examined into the hospital department of the institution. They found everything here in excellent order, and apparently in very efficient hands. The change of the road in front of the hospital building, suggested in the report of the committee on police, will, when made, give a privacy to the hospital which it at present wants. There should also be a better supply of water, and hot and cold and shower-baths should be added to the establishment, if for no other reason than in reference to their character as curative agents. In the opinion of the board, a change in the mode of ventilating the building might also be made with advantage.

The alterations and additions here suggested have reference to the improvement of the present hospital; but the board are of opinion that a new building, on a better general plan, with better ventilation, in a more quiet place, and with all proper conveniences connected with it, should be erected; and they recommend the expediency of doing this to your consideration.

In what the board have said of the health of the cadets, they have spoken from their personal intercourse with them, and from their appearance during the examinations before them. The subject of health was one of such importance, however, that the board deemed it proper to make special inquiries of the surgeon in regard thereto; and they annex to their report the letter addressed by him to the chairman of the committee on police, to which they particularly invite your attention, and the suggestions of which have the full concurrence of the board.

They confide in the medical suggestions which are made by the surgeon, not only because they proceed from high medical authority, but because they have on their face the evidence of their correctness. A suggestion, however, which the surgeon makes, and which is uncon-
nected with mere medical experience, has struck the board as well deserving of notice. It is, that the causes of the complaints of the cadets should not be considered as communications protected as professional confidences, in those cases which show them to have been violations of the express regulations of the academy. The board refer particularly to the use of ardent spirits and tobacco. If it is the duty of an officer other than the surgeon to report the cadet whom he finds drinking or smoking, there is no reason why the surgeon's duty should not be the same. They can appreciate the high and honorable feeling which controls the surgeon; but there are cases where it may work great evil, and this is one of them.

The board could say much more on this subject, but they content themselves with again commending the communication of the surgeon to your most favorable consideration. It strikes the board as being complete with valuable suggestions.

It only remains for the board to call your attention to the fiscal affairs of the institution. These are included under the heads of, first, the Engineer department; second, the Quartermaster's; and third, the Treasurer's.

1. The Engineer department has charge of the erection of the new barracks, for which the appropriations by Congress, up to the 1st July, 1850, amounted to $147,500; and the expenditures, up to June 1, 1849, to $102,380 28; leaving an unexpended balance at the last date of $45,119 72. There is yet required for the completion of these barracks, together with the necessary out-buildings, according to the estimate of the engineer, the further sum of $48,500, to be supplied by an appropriation by Congress. Partial appropriations have, in like manner, been made for the commencement of the riding-house, the mess-hall, the barracks for the sappers and miners, and an hospital for the soldiers stationed at the post—all of them buildings which should be commenced and completed at the earliest day.

2. The accounts of the Quartermaster's department exhibit the appropriations for the academy, other than the pay of the cadets, and the disbursements therefrom. These appropriations, with an unexpended balance in hand, amounted, for the fiscal year ending June 30, 1849, to $34,029 62; of which there remains on hand at this time the sum of $9,132 78. The board have examined the expenditures under this head, and believe them to have been wisely and prudently made, and essential to the interests and prosperity of the academy.

3. The accounts of the Treasurer exhibit the disbursement of pay to the cadets; and here the system seems to have been made eminently simple and efficient. The book of a cadet shows, at a glance, the condition of his account and the objects of his expenditure during his entire term; and the examination of a number of these books, taken at random, satisfied the board that the money of the cadet was most carefully husbanded, and none of it allowed to be spent in idle extravagance, or indeed for anything not absolutely necessary. The board make particular reference to the report of the committee on fiscal affairs, and the documents accompanying it, which will be found in the appendix.

In concluding this report, the board of visi tors would reiterate the expression of their satisfaction with the condition of the institution. It has so happened that five of the attending members of the board, now and for many years engaged in the business of civil life, have at different times been pupils of the Military Academy; so that the board has had within itself an experience of affairs here, commencing upwards of thirty years
since, and continuing, at different periods in the interval, down to the present time. This has not been without its value in the investigations in which the board have been engaged. Means of instituting a careful comparison were always at hand; and with this, and a thorough examination of affairs, facilitated, in every particular, by the officers having charge of them, the board are able to bear testimony to the fact that the progress of the institution, through successive years, has been one of constant improvement, keeping pace with the times, often ahead of them, taking the lead in whatever was liberal and enlightened, and fulfilling, in all particulars, the great and important national purposes for which the Military Academy was originally founded. It has, in its practical operation, sown broadcast over the land an amount of knowledge of military affairs which has stood in the place of a standing army, when the exigencies of the republic required more men than the regular garrisons of its posts could furnish. It has established relations among its pupils from the remotest districts which may be ranked among the conservative influences affecting our union as one people; and, situated as it is among scenes consecrated by the cherished memories of our revolutionary day, and on the spot hallowed by the presence of Washington, it has, it is believed, created and maintained, in the bosoms of all who have been educated within its walls, a sacred love of country; and the great proportion of its pupils feel that it has also created a love of all that is truly good and great, and an abhorrence of all that is mean and vile.

All which is respectfully submitted.

JOHN H. B. LATROBE, of Maryland,
PRESIDENT OF THE BOARD.

JOHN S. ABBOTT, of Maine.
HORACE MANN, of Massachusetts.
DANIEL TYLER, of Connecticut.
JEROME FULLER, of New York.
JOHN L. GOW, of Pennsylvania.
PATRICK M. HENRY, of North Carolina.
J. McCaleb Wiley, of Alabama.
R. W. BURNET, of Ohio.
H. A. BULLARD, of Louisiana.
W. T. STOCKTON, of Florida.
H. HOUGHTON, of Iowa.
A. H. KENAN, of Georgia.
RUFUS KING, of Wisconsin, Secretary.

Hon. Geo. W. Crawford,
Secretary of War.

Memorandum of matters specially suggested in the report.

Care in the selection of cadets, in reference to the capacity and previous acquirements.
Maintaining the authority of the academic staff and the discipline of the institution, by respecting, except in cases of clear wrong, sentences of dismissal.
Substituting physiology, to a limited extent, in place of logic, in the course of studies.

Dividing the duties now performed by the chaplain, and giving the course of international and constitutional law to a separate professor, who might instruct in regard to courts-martial and rules of evidence.

Putting the materiel of military instruction on the best footing, and increasing the number of horses to one hundred.

Changing the system of supplying the cadets with boarding and necessaries, in the manner recommended.

Increasing the pay of the cadets to what it was formerly—$28 20 per month.

Giving to the superintendent the pay of a colonel of engineers.

Dismissing, for deficiency in all the classes, at the January as well as the June examination.

Making it the duty of the surgeon to report the causes of disease among the cadets, when he becomes aware that they are to be found in the use of tobacco or liquor.

A new hospital, on a better site, and on a better plan of construction.

APPENDIX.

The committee to whom was referred the subject of the instruction and education of the cadets at West Point, so far as their course of study coincides with that pursued at common literary or scientific institutions, and is exclusive of what is peculiar to the academy as a military school, submit the following report:

This subject may be considered under two heads:

1st. With reference to the efficiency of the instruction given to the cadets; and,

2d. With reference to the extent or comprehensiveness of the course which is studied by them, and the relative eligibility of the studies which the course embraces.

Methods of instruction are as various as teachers are numerous. The pupil soon learns the method adopted by his teacher; and, having learnt it, he conforms his course of action to it. The teacher's habitual method of questioning, or examination, is as present with the pupil when studying his lesson, as it is when he witnesses that method in full operation in the recitation or class room. The pupil remembers the manner in which he has been examined, and so anticipates the manner in which he will be. If the instructor's questionings are expected to have reference only to the words of the lesson, as contradistinguished from its ideas, then the pupil will seek to remember only the words, and become heedless as to the ideas. If a verbatim recitation is demanded, the words and the order of the sentences will be committed to memory; and with these the effort and the ambition of the pupil will cease. If leading questions are put by the teacher, or if all his questions are cast in the same mould, and indicate what answer is expected, then the pupil will watch the manner of the teacher, and will divine or prognosticate the answer which is to be given, not from any knowledge he has of the subject, but from the man-
ner in which the subject has been presented. If indefinite and ambiguous answers are accepted by the teacher, then the pupil will strive to conceal his ignorance under indefiniteness and ambiguity, and will endeavor to frame his replies in such a manner that, when the truth is at last discovered, his answer will be the oracle that had declared it. If the pupil is allowed to say, "I have the ideas, but cannot express it," or, as the schoolboy once said, "I know when you don't ask me," then all manner of excuses will be invented, all subterfuges will be resorted to, to avoid the one all-important, all-essential quality in study and recitation—exactly defined and clearly-expressed truth; in fine, that will be done by the student, out of the recitation room, which it is supposed will meet the demands of the teacher in it. If the teacher is known to demand ideas, and not forms of words; if he is known to be inexorable in this demand; if it is known that he will grant no dispensation beforehand, nor pardon afterwards, then the whole effort of the pupil's mind will be concentrated upon the subject-matter of his study; he will seek to understand it, not only in its direct and immediate, but in its collateral and remote relations; and the mere words of an author, excepting those technical terms or phrases which are necessary to precision, will cease to be material. The idea, the sentiment, the thing as it exists in nature, will be sought out with assiduity and with energy. A merchant will as soon carry base metal to an assayer, and expect it to be received as genuine, as a pupil will carry words and sounds to a teacher who demands ideas, or will expect to tickle his ear with atmospheric vibrations, when it is known that he will listen to nothing but the eternal verities of science.

The effect of these different courses is indescribable: the one leads outright to a knowledge of the history of men and the works of God; the other leads to the land of dreams and shadows, to nothingness, and to shams, which are worse than nothingness. If a teacher allows a pupil to recite superficially, he encourages and invites him to study superficially; and a superficial student becomes a superficial man. Thus the teacher is responsible for sending out into the world superficies of knowledge, instead of cubical or solid contents. On the other hand, the pupil, accustoming himself at first, perhaps from necessity, to master his studies, will soon find unwonted pleasure in the exercise; for the pleasures which nature affixes to any acquisition always bear a proportion to the dignity and elevation of the faculties employed in acquiring; and the faculty of knowing things is indefinitely higher than that of remembering words. At last, habit and enjoyment will bind him to that superior method which the necessity imposed upon him by a faithful teacher may have begun.

The committee have had no opportunity to witness recitation or class exercises; but they have attended the general examination from day to day, and can say, without hesitation, that the mode of questioning which is pursued, and of study which is indicated, seem to them to be of the highest order. Of course, as the committee hold that the style of answering will correspond, in a great degree, to the style of questioning, it follows that the appearance of the cadets has generally done them great credit. With very few exceptions, (from which no institution can be wholly exempt,) the committee have rarely, if ever, seen anything better; and very rarely, too, have they seen anything so good. The entire self-possession of the cadets; their command, not merely of their mind, but of their muscles; their firm, erect, and manly bearing; the entire absence of all fidget-
ing and restlessness, of shuffling and shrugging, of shifting their weight from foot to foot, and from point to point, as though the centre of gravity beneath them was changing its place, and they were striving to find it: these and similar characteristics of self-dependence and manliness have been, in the highest degree, remarkable and creditable; and it is earnestly to be wished that, whatever opinion the instructors in other institutions may have of the peculiar character and objects of this, they would, in this respect, find a model here, and reproduce it in their own seminaries. It is most agreeable to see a scholar who has the self-possession of a soldier; who can fix his body to one spot, as well as his mind to one subject; and who can pay attention so exclusive and devoted to the thing in hand as to have no surplus attention left for annoying others or discomposing himself. It is believed that such physical habits would greatly add to the student’s power of mental concentration.

In regard to the extent of the course pursued by the cadets, it seems to be sufficiently full; and when their age and their limited attainments at the time of admission are considered, it seems to be sufficiently severe. The committee see no opening through which they can wedge in a new study. If new studies are introduced, the only alternative is to displace some of the old ones. Notwithstanding this, the committee are constrained to say that there are some points in which the culture of an officer and a gentleman should be more extended and more critical. In the first place, there seems to have been at this institution no systematic cultivation of the voice. Hence not only a loss of those agreeable tones and modulations of which the human voice is capable, but an articulation so indistinct as often to be unintelligible. Neither does any standard for pronouncing our language seem to be recognised. The cadets, coming from the thirty different States of the Union, bring with them the various pronunciations and the provincialisms of each; and if not corrected here, they will carry away as many as they bring, fastened upon them as habits for life. Among accomplished English scholars, whether found in either of the three kingdoms of Great Britain or its colonies, or in any part of the United States, there are comparatively but few points of difference in orthoepy, or in enunciation. In a national institution like this, therefore, great departures from the common usage of the best English and American scholars and speakers is not creditable; and it would be a subject for regret if young gentlemen, so highly accomplished in many respects as the cadets certainly are, should carry out into the world provincialisms or vulgarisms of speech or of pronunciation, to be worn, like some unsightly blotch or tumor upon the face, and to give offence in educated and cultivated circles, wherever they may go.

But there is one branch of study of which no trace seems now to be found in the course, but which the committee deem to be pre-eminently worthy the attention of those who have the direction of this subject: it is that of human physiology, or the laws of health and life. Modern observation and research have made it certain that good and ill health, that longevity and premature death, are the consequences of fixed laws. These laws are as immutable in their operation, and as infallible in their results, as those which determine the order of the seasons, or the occurrence of eclipses. If the antecedents vary, the consequents vary also. Most of these laws are now discovered; hence the means of securing health and of enjoying long life, in the great proportion of cases, are also
discovered. Hence, too, in an equal proportion of cases, mankind are responsible for the want of health and of fullness of days; and those who have the power of teaching these laws, but abstain from it, may be justly held accountable for the cost, the pain, the loss of utility and the loss of life, consequent upon their neglect. Many of the ablest physicians in this country have certified it to be their opinion that, even in the present state of physiological science, at least one-half of all sicknesses and diseases; and of all premature deaths, are the result, not of any necessity, not of any fatality, but of sheer ignorance; of such ignorance as belongs to brutes, operating in conjunction with passions that belong to men. Sickness and bereavement are supposed to be what eclipses and earthquakes were once supposed to be—the effect of some arbitrary interference by a superhuman power, for some special purpose, and not as the invariable results of unchanging laws. But modern science has rescued this whole subject of health and life alike from the domain of chance, and from the dominion of arbitrary will. In the majority of cases, it has shown us why we are sick and how we may be well; why so vast a proportion of the human race die at an untimely age, and how their lives might have been prolonged. If we would have it well with us morally, everybody understands that we must obey the moral law; so, if we would have it well with us physically, it is just as certain that we must obey the physical law. In both cases, knowledge is a preliminary to obedience. We have no right to charge upon the providence of God what comes from our own improvidence.

The soldier is exposed to peculiar hardships and privations. In this wide-extended country, he is liable to be transferred from the climate of his birth and residence almost to another of the zones. He may be carried from the cold and bracing winds of the north, to the sultry and enervating heats of the south; from the seaboard to the interior; or from open, cleared, and highly cultivated regions, to those where the atmosphere is heavy with the miasma of stagnant waters in unbroken solitudes. It often happens that the soldier cannot command the kind of provisions most conducive to health. Many diseases are best treated, not by medicine, but by regimen; and the administration of this remedy requires a constantly presiding intelligence. Often the shelter of the soldier fails to protect him from the inclemency of the weather, and almost always is he exposed to more or less of dampness by night, which is a prolific cause of chronic, and, eventually, fatal distempers. The soldier, therefore, above all other men in the community, ought to be supplied with the shield of knowledge to ward off the dangers of his vocation. The mortality of the camp is found to be greater than that of the battle-field. This needs not to be so; and, with intelligence on the part of the soldier, in regard to the laws of living, it would cease to be so.

If these views are applicable to soldiers, they apply with greatly increased force to officers, who are to command soldiers. In selecting salubrious or insalubrious spots for an encampment; in directions given to the purveyor of provisions; in the time allowed and occupied not less than in the time selected for taking meals; in causing all noxious and fermenting substances to be far removed from quarters; in securing the personal cleanliness of the men by frequent ablution; in alternating exercise with rest, and selecting the appropriate seasons for each;—in these, and in kindred respects, the officer has as much power over the lives of
his men when pursuing a march, or reposing in a camp, as on the day of battle; and it seems hardly more preposterous to send a commander into the service who knows nothing of the profession of arms, than to intrust the lives and health of men to one who is ignorant of hygiene. The committee, therefore, would earnestly recommend the incorporation of human physiology into the course of studies pursued at the academy; and, as some existing study must give way for its admission, they would propose the discontinuance of what is now taught at the academy under the name of logic.

The committee have listened attentively to the examination of the cadets on the subjects of constitutional law, on the law of nature and nations, and on ethics. These branches are all taught by the chaplain of the academy, or under his supervision. The last, that of ethics, falls most appropriately within his sphere of duties; but if there is any reason for having the military art taught by a military man, there seems to be a reason at least of equal cogency for having constitutional law, and the law of nations, taught by a jurist. The committee intend not the slightest disparagement of the reverend chaplain by these remarks: he seems to have done even better than could have been reasonably anticipated. But this admission, which the committee most cheerfully and conscientiously make, takes but little from the weight of their suggestion. The duties of the chaplain, as a minister of the Gospel and as a teacher of morals, are abundantly sufficient to occupy the whole time, and to exhaust the whole energies of any one man; and the committee are of opinion that studies widely diverging from his profession, and requiring such a broad basis of legal knowledge, should not be imposed upon him. In ethics, the text-book of Dr. Weyland is used; but, in compliance with an order issued by some former department of the Executive, the chapter on war is omitted. If any difficulties are presented by considering the profession of arms, in its relation to the moral law, it seems not soldierly to avoid them, or go round them. From an enemy it may be lawful to escape; but not from obligations that are interwoven with the heart of man, and bind him, in indissoluble and eternal connexion, with the throne of God. If anything pertaining to war deserves to be studied and pondered long and deeply, those considerations which show its relations to morality, and to the Gospel, deserve attention first and last, and most.

On the subject of our duties to our fellow-men, the committee would have been highly gratified could the examination have been more full. On the second of those great commandments, without which neither the law nor the prophets have any support—the commandment that we shall love our neighbor as ourselves—and upon the point, also, that within the true scope and meaning of this command, the border Samaritan, however despised or however despicable he may be, is our neighbor—upon these points nothing was said. This may have been accidental, but we deem it an omission; for it is incompatible with the highest obligations of a Christian people to support any institution which cannot bear exposure to the clearest and directest light of Christian ethics. If what Lord Wellington is reported to have said in the British House of Lords be true, namely, that a man of refined, religious sensibilities has no right to be a soldier, then ought the business of the soldier to be forever struck from the catalogue of human vocations.
In conclusion, the committee would express the opinion that when they consider the length of the course and the severity of the studies pursued at the academy, they have rarely, if ever, seen anything which equalled either the excellence of the teaching or the proficiency of the taught.

HORACE MANN.
RUFUS KING.
H. A. BULLARD.

Report of the Committee on Administration.

The administration of the United States Military Academy is conducted by a military and academic staff, composed as follows, viz:

1 captain of engineers, superintendent.
1 professor of engineering, and two assistants.
1 professor of natural and experimental philosophy, and three assistants.
1 professor of mathematics, and six assistants.
1 professor of chemistry, &c., and two assistants.
1 professor of ethics, and three assistants.
1 professor of drawing, and two assistants.
1 instructor of practical engineering, and four assistants.
1 instructor of infantry tactics, and four assistants.
1 instructor of artillery and cavalry, and two assistants.
1 professor of French, and two assistants.
1 surgeon, and one assistant.
1 adjutant.
1 instructor of the sword exercise.
1 treasurer.

Of these forty-six persons forming the staff, thirty-eight are officers of the army, and are employed in discharging various duties connected with the institution.

The organization of the academic and military staff seems well adapted to the wants of the institution, and the system of calling to the aid of permanent professors officers of the army as assistants, commends itself to your committee as one of great wisdom, and as conferring great benefit not only to the officer, who returns to the institution to revise and extend his course of studies, but to the cadet, who receives instruction from officers who combine both the theory and practice of the profession.

The administration of the academy is closely connected with the discipline, and it seems difficult to draw a dividing line between the different committees without possibly omitting matters of great importance to the institution. Your committee would refer to punishment awarded by courts martial, (which may be treated by the committee on discipline,) and on mature consideration they are obliged to come to the conclusion that in every case where dismissal is awarded, the sentence should be carried into full execution. It is no great hardship for a young man from 16 to 20 years of age to change his occupation and settle himself in private life; while it is believed that every suspended or dismissed cadet who returns to the academy, inflicts an injury which is felt by the institution. As the expense of the education is borne by the country, and as the applicants pressing into the institution exceed by far the wants of the army,
it is right and best that every young man unwilling to submit himself unreservedly to the regulations of the academy, and to exert himself to acquire a full knowledge of the course, should return to private life, where the injury which results from insubordination and indolence will be less felt than at the Military Academy.

Your committee, in connexion with the administration of the institution, has been led to examine into the expense that would attend increasing the number of cadets so as to add two for each State. As the law now stands, each Congressional district is entitled to send one cadet, and the good effect of this provision is very manifest. Not only every State is represented, but the sections of each State; and your committee would suggest that an additional expenditure of $20,000 annually would give to each State a number of cadets equal to its senators and representatives in Congress. It remains with the Executive to determine whether the increase will be called for by any prospective increase of the army which the extended territories of the Union may demand: but your committee beg leave to express to the board the opinion that every dollar expended in sustaining and extending the institution to the full extent of its wants of the army, and, to a partial extent, to the wants of the militia, will form part of a judicious investment made for posterity.

In looking into the administration of the academy, the attention of your committee has been called to the expenses incident both to the government and the cadet, and the conclusion is forced on it that, if the government intend to place an education here within the reach of every young man joining the institution, and to put the cadets, rich and poor, on a perfect equality, that object is not now accomplished. Means beyond the pay allowed by the government are absolutely necessary to support a young man at the institution for four years, even provided he denies himself the high privilege of visiting his friends once during that time. One hundred dollars appears the least possible amount, over and above the pay allowed, (viz: $24 per month,) to carry a young man respectably through; and small as the sum is, instances are within the knowledge of your committee where it could not be had. While it is hard for the young man who has rich parents to curtail his expenditures, as he is obliged to do, to articles strictly necessary for his support, it is harder still for the high-spirited young man, whose friends may be poor and unable to assist him, to lack those things absolutely necessary to feed and clothe him.

The subject of compensation does not seem to come naturally in charge of the committee on administration; but from the system of supply which is thought necessary to carry out "the administration, &c., of the academy," this subject presents itself to your committee as one for its consideration. So long as but one storekeeper, one tailor, one baker, and one butcher, is allowed, each monopolizing in his own business all the transactions of the place, take such measures as you will, there will be a monopoly, which will affect the pockets of the population.

The effect here now is to make New York a standard for prices; and the butcher, storekeeper, tailor, and shoemaker here, where he pays no rent, demands the prices, and more, that he would in New York. This system operates severely on all connected with the Military Academy—commandant, professors, officers, and cadets—each paying in proportion to his necessary expenditure. This works injuriously, as well as unjustly; and it
does appear to your committee that the system of furnishing should be changed, to meet the case. It has suggested itself to your committee that the commencement should be made by bringing to the academy an additional commissary of subsistence, to be put on the academic staff, and to have charge of providing the cadets with provisions and such things as are now furnished from the store; and, as the system shall be perfected, to extend all the privileges to the professors and officers at the institution. There may be difficulties in working out the system, but your committee believe it to be practicable; and if it is put into the hands of a competent commissary, who would feel that it was practicable, it is believed it would eventually be perfected. At all events, the effect of bringing the entire responsibility on one man, and he a commissioned officer, would prepare the way for a successful change in these matters, which interest not only the government, but every person at West Point.

Whether this system is carried out or not, it does appear to your committee that the pay of a captain is in no way adequate to the support of the superintendent, and that, if more rank is not to be accorded to the meritorious officer now in command, and the pay consequent to that rank, additional pay in some way or other should be accorded, to enable him to meet the expense necessary to sustain him respectably in the position in which the government has placed him.

The pay of regimental adjutant should be allowed, as a matter of justice, to the post adjutant, whose duties are by far more onerous and responsible than that of any regimental adjutant in service.

One of the most important subjects in the administration, as it strikes your committee, is connected with the examination, which takes place every six months, of all the classes at the Military Academy. At these examinations, not only the relative positions of the cadets are fixed with great justice by the academic board, but the cadets found deficient, who are either turned back or discharged, are designated. On a careful review of the examination just passed, the opinion has fixed itself on your committee that cadets found deficient in January, on their first examination, should be discharged, and that the examination should be close and rigid. In very few instances do those cadets approaching deficiency in January pass the June examination; and your committee would recommend, as an act of kindness to the young man, that where the prospects of passing are decidedly against him, he should be returned as early as possible to his home. Six months' absence will hardly have changed his home relations, and he returns to them as from a visit, benefited, no doubt, by the instruction he has received, and immediately resumes his previous avocations. Keep him a year or eighteen months, and the case is changed, and it is with difficulty he resumes his previous position and pursuits. It is believed by your committee that the best interests of the government and the cadet demand that the connexion which is not to be to a degree permanent should be severed at as early a day as practicable.

While on this subject, your committee would recommend that dismissal in the different classes for deficiency should be made by the academic board in January, as well as in June. Under the impression that the January examination is of little account, many young men of fine talents neglect their studies during the first six months, with the intention of making it up on the last. Sometimes they are successful; but example has a bad effect on their fellow-students of less capacity, and is injurious
to their own character. The habit of unequal exertion in every profession is a bad habit; and the young men who in early life may be successful in the practice of it seldom arrive at any subsequent distinction. In every view of the case, your committee would recommend that the January as well as the June examination should decide whether a young man is to remain at the academy.

The laws, and their resulting regulations, which govern the administration of the Military Academy, seem to your committee admirably adapted to the nature and purpose of the institution; and everything at the present moment seems to have assumed a permanent shape, and only awaits that development which time and progress will give to make the institution all that the government or the country can wish. Your committee cannot see at this time that any further legislation is required. The firm, steady, and uncompromising support of the academic authority, with judicious and liberal appropriations, seems all that is required to work out the progress and perfection of the institution. Should any change be made, by adding another year to the course of studies or otherwise, no additional legislation will be required, as this is entirely within the control of the Executive; and no additional professorships will be required, as the additional studies can be conveniently divided among the present professors.

In closing this report, your committee would remark that the main object of the administration, as a whole, is to conduct and complete the moral, military, and scientific education of the cadets, so as to fit them to conduct the military affairs of the republic. Your committee, on full examination, believe that it effects this important purpose, and that at no previous time has this great object of the academy been better cared for and secured than at the present. The zeal and talents of the superintendent and of the academic board, the great interest expressed and shown by all concerned in the administration, show that the trust is reposed in safe and able hands; and the events of the late conquest of Mexico have demonstrated that heretofore the practical results of the institution have conferred honor and glory on the country; and we believe that the future is full of hope and confidence.

All which is respectfully submitted.

DANIEL TYLER,
JEROME FULLER,
JOHN S. ABBOTT.

Report of the Committee on Discipline to the Board of Visitors, West Point, June, 1849.

The committee appointed to inquire into the discipline of the United States Military Academy respectfully submit the following report:

No department of the academy is more important, or demands higher requisites in its administration, than that which is charged with the military instruction and discipline of the cadets. Their first and strongest impressions of military life are received from the deportment of the officers placed over them. To this source they look for those examples of morali-
ty and gentlemanly bearing so becoming the profession of arms; while their efficiency and standing in the public service must depend, in no small degree, upon the fidelity and capacity of those at whose hands they receive their earliest instructions. Impressed with this belief, your committee have deemed it their duty to inquire minutely into all matters pertaining to this department; and they take pleasure in saying that they have been greatly aided in their researches by the members of the academic staff, who solicited, and seemed anxious for, the most thorough and comprehensive investigation. The deliberate judgment at which your committee have arrived is, that no system of discipline could be established on sounder principles, or administered with greater kindness, discrimination, and decision, than that now in force at the Military Academy. The rules for conferring rewards, or inflicting punishment, are clear, explicit, well settled, and well understood by the cadets, and none can incur censure without previous and ample warning. While power is exercised in the most paternal manner, and with the strictest justice, it is gratifying to know that the professors and officers are very generally respected and esteemed by the cadets. The strict and uniform observance of the articles of war, the regulations of the army, so far as applicable to this institution, and the regulations for the government of the academy itself, as adopted by the academic board and approved by the President of the United States, has contributed most efficiently to the high discipline of the corps. Some indeed have questioned the policy of throwing so many restrictions around the cadets; but, after a careful examination of the rules referred to, your committee feel it their duty to testify to their general excellence, and their peculiar adaptation to the wants and purposes of the institution. Without the restraints thus imposed, there could be no discipline; and without discipline, the academy would be well nigh, if not altogether, useless to the country.

The military instruction of the cadets, more especially in the light artillery, cavalry, and infantry branches of the service, was the subject of minute inquiries on the part of your committee. As it is the design of the academy to provide the country with officers competent to the duties of the different arms of the service, your committee are of opinion that more extended facilities should be given for instruction in light artillery and cavalry. There should be at the academy a full set of equipments, horses, &c., for a company of light artillery. There are, at this time, some forty-five horses and thirty dragoons at present at the Point employed in the practical instruction of the cadets. But these horses are also used in the cavalry drill of the corps; and, being overworked and employed in both branches of instruction, cannot be properly trained or efficiently used in either. Nevertheless, under all these disadvantages, the proficiency of the cadets in the light artillery drill is quite remarkable; and their instruction in the management of the field-piece and the movement of the battery is thorough and practical.

Your committee attended a platoon drill of cavalry in the field, as well as the riding exercises of the first class in their hall. The same disadvantage exists as to the instruction in cavalry drill, that has already been adverted to in relation to the light artillery. There are too few horses to serve the wants of the class; and those now here, being used both for cavalry and artillery drill, are unfitted for either. It would re-
quire one hundred horses to supply the wants of the corps in this respect, and to extend the riding exercise occasionally to all the cadets. Your committee would, therefore, suggest to the board that they recommend the purchase of an additional number of horses—say sixty—for the use of the corps. It affords us pleasure to say that, notwithstanding these drawbacks, the cadets display great proficiency in the cavalry drill, ride with ease and confidence, sit well and firmly in their saddles, and manage their horses and weapons with creditable skill. All this has been accomplished with insufficient means and in limited time, and in a riding hall wholly unsuited to the purpose for which it was designed. It is to be hoped that an addition to the number of horses and the erection of a new riding hall will enable the academic board to place this necessary branch of military education on a proper footing.

For the purpose of instruction in infantry tactics and the discipline of the cadets generally, the corps is organized into a battalion of four companies—each having a captain, three lieutenants, four sergeants, and four corporals. There is, besides, a battalion staff, consisting of an adjutant, a quartermaster, a sergeant major, and a quartermaster's sergeant. These commissioned and non-commissioned officers are all appointed by the superintendent upon the recommendation of the commandant of cadets; and those are selected to fill these honorable stations who have been most active and soldier-like in the performance of their duties, and most exemplary in their general deportment. The captains and lieutenants are taken from the first class, the sergeants from the second class, and the corporals from the third class. The instruction of the cadets in the school of the soldier, of the company, and of the battalion, is careful and thorough. Your committee had the pleasure of attending a battalion drill and frequent parades and reviews of the corps, during the past fortnight; and they cannot refrain from expressing their high admiration of the proficiency and skill evinced by the corps generally, and of the military bearing, the easy and graceful movements of the cadets individually. Thus carefully instructed themselves, the cadets in turn are prepared to teach others, when occasion serves or duty requires, and to set in their own persons, examples of gentlemanly conduct and soldier-like qualifications to all with whom they may be associated in the service of the republic.

As coming properly under their notice, your committee made various inquiries into the modes and degrees of punishment inflicted upon the cadets for disobedience of orders, disrespect to superior officers, or any other violations of the regulations of the academy, as military law and usage. The cadets are subject to the rules and articles of war, and may be tried by regimental or garrison courts martial. The punishments to which they are liable are thus classified:

1st. Privation of recreation, extra guard duty, reprimand, arrest, and confinement in room or tent.

2d. Confinement in light or dark prison.

3d. Dismission, with privilege of resigning; public dismission.

The punishment of the first class may be inflicted by the superintendent, or with his approbation; but those of the other classes only in virtue of a sentence of a general court martial, except in cases of breach of arrest or mutinous conduct. As to rewards for good soldiership, the only system practised is that of bestowing appointments, as commissioned or non-
commissioned officers, upon the most soldier-like and most exemplary in their general deportment—a system which creates a very commendable spirit of emulation among the cadets. Personal difficulties among the cadets are of rare occurrence, and in several instances have been adjusted by the kind interposition of the commandant of cadets. No cadet is permitted to send, accept or carry a challenge, written or verbal, nor in any way be a party to, or promote, a duel, on pain of dismissal from the service of the United States; and any cadet using provoking or reproachful gestures to another, or who shall strike, or traduce, or defame another, is liable to be dismissed, or otherwise less severely punished, according to the nature of the offence. All combinations are strictly forbidden—an excellent feature in the code of regulations prescribed for the government of the corps. Your committee are satisfied, from their investigation, that the present high discipline and general good conduct of the cadets results not only from a rigid enforcement of these various rules, but also from the kindly intercourse between the academic staff and the corps, and the excellent relations existing among the cadets themselves. Occasionally, the necessity arises of inflicting the punishment of dismissal upon the delinquent. This, though always to be regretted on account of the friends of the delinquent, and sometimes of the delinquent himself, involves a duty to the country which ought not to be neglected. It cannot be supposed that officers who feel so deep an anxiety in the success of this institution would thoughtlessly or wrongfully send home a young man in disgrace to his parents or guardians, to poison their minds against the academy. Your committee cannot, therefore, doubt that the academic staff are guided in these, as in all other instances, by a high sense of duty and the strictest justice; and they are strongly of opinion that, when such a decision has been pronounced against a delinquent cadet by competent authority, it should not be interfered with. Nothing is so well calculated to beget a feeling of insubordination among the cadets as the setting aside the findings of courts martial, or the decision of the superintendent and officers in charge, upon insufficient grounds; satisfied, as we are, that the authority vested in the officers of the academy is exercised with the kindest feelings and the best motives, and that the infection of one insubordinate cadet works infinite mischief in the whole corps. Your committee are decidedly and unanimously of opinion that, except in extraordinary cases, the degrees of courts martial, and the decisions of the academic staff, ought not to be set aside or altered.

Your committee have received no little aid in their inquiries from the full and satisfactory statements furnished by the academic staff, touching the principles upon which every part of the instruction and discipline of the academy is conducted. In all these details they see little or no ground for improvement; and the excellence of the general system is abundantly proved by its fruits. Your committee observe, with great satisfaction, the correct deportment and manly bearing of the cadets whilst undergoing their several examinations; their confidence in themselves and in their professors, the good order and cleanliness of their quarters, and the neatness of their dress and persons. The employment of time during the day was carefully looked into, and your committee think it so well systematised, as to render any suggestions from them unnecessary. The excellent methods of classifying the cadets according to their proficiency in their studies and general correctness of conduct can-
not be improved. In fine, your committee are unanimously of opinion
that the military instruction, general discipline, and internal police of
the academy, at the present time, are in the best condition; and, while
they contribute most efficiently to the public interest, reflect the highest
credit upon the faithful and competent officers who are charged with their
supervision.

One or two general remarks will close our report. While many regard
standing armies as dangerous to a nation's liberties in time of peace, few
will question their advantages in time of war. To reconcile the dangers
and advantages, then, of standing armies, they should be so organized
that, from a very moderate, they may, upon emergency, be increased to
a very large size. This desideratum can only be obtained through the
medium of a military academy, where the strictest discipline is enforced,
and the highest branches of military science are carefully taught. The
knowledge thus imparted, if not immediately available by reason of a
general peace, is diffused among the people, and while highly useful
when war does break out, becomes at once a valuable auxiliary in the
prosecution of those various works of internal improvement upon which
the growth and prosperity of our country so largely depend. Those who
remember the humiliating disasters, the loss of life and treasure, at the
commencement of our last war with Great Britain, and contrast with
these the brilliant results, uninterrupted by a single reverse, of the late
campaigns in Mexico, will need no other arguments than these facts and
the inferences fairly deducible from them furnish, to make them appre­
ciate properly the advantages of such an institution as the academy at
West Point. Through its agency, a knowledge of the science of war, in
principle and practice, is imparted to a sufficient number of our citizens
to enable us to cope, on a footing of equality, with the most powerful and
skilful enemy. Nor are the benefits of the academy confined to the regu­
lar army. It is all-important as a seminary for the instruction of officers
of the militia. If we observe the organization of the volunteer and uni­
form corps in the principal cities of the Union, we find among their best
officers graduates of the Military Academy, who, after a longer or shorter
period of public service, have retired to the pursuits of civil life, only,
however, to be sought out there and summoned to take high and respon­
sible stations in the line and staff. The recent campaigns in Mexico
afford frequent and gratifying instances of graduates of the academy
returning from private life to the public service, and by their brave and
skilful conduct as officers of volunteers, and in other capacities, repaying
the debt they owed their country, and reflecting lustre upon their alma
mater.

In conclusion, your committee desire to bear the strongest testimony
to the admirable organization and management of the academy, and to
the fidelity and ability with which the officers intrusted with this respon­
sible duty discharge their several trusts; and they entertain an abiding
conviction that, while it continues to fulfil, as well and satisfactorily
as now, the purposes for which it was established, it will enjoy, as it well
deserves to do, the good opinion and the liberal support of the American
people.

All of which is respectfully submitted.

J. McCaleb Wiley, Chairman.
Rufus King.
Patrick M. Henry.
The committee to which was assigned the duty of examining into, and reporting upon the system of police adopted by the various departments of the United States Military Academy, beg leave to report:

That the various officers to whom they have applied for information in relation to their appropriate duties, have not only treated them in the most courteous and gentlemanly manner, but extended to them every facility necessary for the accomplishment of their object.

Your committee beg leave to report, for the information of the board, that the old north barracks, which will necessarily be occupied by the cadets until the completion of the new quarters, are in a dilapidated condition. Owing to the natural decay of timber, bad ventilation, and the immediate vicinity of out-buildings provided for the use of the corps, an atmosphere is generated which is quite offensive, and necessarily prejudicial to the health of the young men, in spite of every precaution which can be used. Particularly will this apply to the lower floor. In this connexion, your committee would suggest that the board should urgently recommend to the attention of Congress the necessity of an appropriation, at its next session, sufficient to complete the new quarters. No reference is necessary to the old south barracks, which have been so much objected to by previous boards, as they will be so soon vacated. The new quarters, as far as completed, are built of the best materials, and in a style which reflects honor upon the government and credit upon the projector. From information obtained from the officers in charge of the building, your committee would state, that one wing or portion of the new barracks, containing one hundred rooms (for officers and cadets,) will be completed on or before the first day of September next, and the remaining portion in a year, or at most eighteen months, if a sufficient appropriation be made by Congress at its next session.

The basement story contains a room for fuel, bath rooms, and a furnace, all of which are well constructed. The apartments for the officers and cadets are peculiarly calculated for their health, comfort, and convenience. Especially would your committee refer with high approbation to the recesses in the rooms for sleeping and dressing. The arrangement enables the cadet to maintain a privacy well calculated to inculcate and preserve feelings of delicacy and propriety so characteristic of gentlemen. Independent of the furnace, which is intended to convey heated air, by means of flues, to every part of the building, the rooms are furnished with fireplaces, which are designed to be used in the event of the failure of the furnace or any part of the apparatus. Your committee cannot dismiss this subject without again referring to the baths, which they deem of great importance in a sanitary point of view, as they are so constructed that either the cold or warm bath can be used at pleasure. They would, however, recommend, in addition to those already supplied, a shower bath in each bathing room, as the cost would be very trifling; and in the event of a partial failure of the water, they could be substituted for the other baths.

The mess hall is in a state of decay, and insufficient for the health, comfort, and convenience of the cadets; and, although every means are
used to remedy the defects, your committee are of the opinion that it cannot be accomplished. A new building for the purpose is the only resource. With regard to the hospital for the cadets, your committee were pleased to find the rooms in admirable condition, and the bedding and furniture ample, and in good order. Your committee were satisfied, from their own observation, as well as from information supplied by the accomplished surgeon in charge, that every attention was rendered to the sick with reference to their comfort and restoration to health. It is deemed indispensably necessary that baths should be arranged in the hospital, not only as a sanitary measure; but as a remedy for many diseases incident to the cadets.

In consequence of the proximity of the road to the hospital, the condition of the sick is at times extremely unpleasant on account of the noise and dust; your committee would suggest, therefore, the propriety of changing it, so as to have it more immediately under the brow of the hill, which they are informed can readily be done.

The quarters of the engineer, artillery, and dragoon detachments were inspected, and found in excellent order; their food is of good quality, very substantial, and, from information derived from the men themselves, well prepared for the table.

But, unfortunately, there is no hospital to which they can be removed when sick; consequently, the indisposed are subjected to privations, and the surgeon of the post to great inconvenience. In the event of an epidemic or general disease, it would be impossible to provide them with quarters. Your committee would, therefore, earnestly recommend to the consideration of the board the necessity of establishing suitable buildings, as above indicated.

As an appropriation has already been made for a new riding hall, it is to be presumed that the government will prosecute it to completion without unnecessary delay. Your committee would, however, remark that the building now occupied for that purpose is insufficient and hazardous to both men and horses, and would therefore recommend to the attention of the board the necessity of abandoning it as soon as practicable.

The attention of your committee has been called to the importance of erecting a suitable guard-house for the soldiers on duty at the Point. Its best location would probably be at the public dock. There is a large amount of public property, for the protection of which there is no shelter. There is no sufficient place of confinement for soldiers who have made themselves liable to punishment for violation of orders or insubordination. For these reasons, your committee believe that the erection of a suitable building is necessary.

Your committee are pleased to observe the order and neatness maintained in the public buildings and grounds.

Though last, not least in importance, your committee are highly gratified by the general appearance of the cadets, not only as regards their health, but also that soldier-like and manly bearing which accords so well with those elevated qualities of the mind which pre-eminently fit them for usefulness to the country and ornaments to society.

In conclusion, your committee would remark, that they have given the subjects committed to their charge a full and thorough investigation. The
result is, the report which they now beg leave to submit to the consideration of the board.

West Point, June 15, 1849.

H. HOUGHTON,

W. T. STOCKTON,

R. W. BURNET.

West Point, June 15, 1849.

Sir: Since I had the pleasure of conversing with you, on the morning of the 12th instant, in reference to matters connected with the medical department of West Point, it has occurred to me that it was my duty to enter more fully into the character and causes of the complaints, on account of which cadets are most usually excused from duty, inasmuch as I feel persuaded that some of the causes may be measurably obviated, and as I am satisfied that their removal would cause the number of those who report sick to be diminished, and exert a salutary influence upon the character and standing of many of the young gentlemen assembled at this institution.

It has been a source of regret, and I may add of vexation, to every medical officer who has been stationed at West Point, to observe how large a number of the cadets evince a disposition to get excused from their military and academic duties, on the plea of indisposition, so trifling as hardly to be evidenced by any of the signs of disease. It has, moreover, been the experience of every medical officer, that the most faithful students and best soldiers are the most rarely to be seen at "surgeon's call," and it would hardly be an error to assert that, as a general rule, they who have the largest number of "demerits" most frequently request relief from duty on account of trifling indisposition—so trifling, if it really exists at all, as not to merit the appellation of disease. It gives me pleasure, however, to express my belief that a large majority of the corps of cadets stand on more elevated ground; and, doubtless, there are many who prefer attending to their duties, although even more unwell than those excused by the surgeon. The former usually take a high stand as soldiers and scholars; whilst the latter are found deficient, or, if they linger on through the period of four years and receive commissions, too often look back with regret at time misspent and opportunities for improvement neglected.

It has frequently been a subject of serious consideration with the medical staff of the Military Academy, whether any means could be devised to break up this system of running to the surgeon on every trifling occasion—a system injurious to the cadets who adopt it, unfair for other cadets upon whom additional duty is thereby imposed, and a tax upon the patience of the medical officer, which, in addition to his other arduous duties, is well calculated to disgust him with his position and induce him to seek a change.

A reference to the register of sick, kept at the hospital, will show that "headache" stands opposite to the names of nearly one-fifth of the number recorded. In the spirit of the most extended charity, let us suppose that four-fifths of the cases reported as headache are bona fide cases of
that complaint! To what causes may they be legitimately referred? There are several which doubtless exert an influence. At the head of these may be placed the use of tobacco. This powerful narcotic-acrid luxury is, it is to be believed, in very general use by the corps of cadets, although positively forbidden by the academic regulations. How often may its noxious odor be detected in the breath of cadets who report "sick." To communicate the fact to the superintendent, when it is believed to be the cause of a cadet's indisposition, would seem to be nothing more than the duty of the medical officer. Unfortunately, an erroneous custom has acquired, by long continuance, the footing of a principle with the medical officers of West Point. The surgeon is looked upon as confidentially intrusted with the secrets of sick cadets, so far as their illness is concerned; and if an inquiry into the etiology of disease, with a view to its more successful management, should lead to the discovery that either the use of tobacco or of intoxicating drinks was the exciting cause, he is expected to confine the knowledge within his own bosom. A confidential friend, the medical officer should assuredly be, under all proper circumstances; but never if that confidence induces him to run counter to the laws of the institution and the interests of cadets themselves. It is my deliberate opinion that this time-honored principle should be annihilated by an academic regulation making it a point of honor, from which there can be no appeal, for the surgeon to report every such case to the superintendent. It is due to the cadets themselves, to the discipline of the institution of which they are members, and to the government, the recipients of whose bounty the young gentlemen here assembled most certainly are. To enlarge upon the deleterious influence of tobacco upon the economy of man, especially whilst that economy is in process of development and before it has attained its full maturity, would here be out of place. Suffice it to say, that the most reliable authority will sustain me in asserting that its influence upon the nervous system of animal and organic life is primarily exciting, secondarily depressing—that it vitiates the character of the salivary secretion; impairs the functions of the stomach; produces mental as well as physical unsteadiness; creates a thirst for other stimulants; induces a desire for slothful indulgence, and, with few exceptions, slowly but surely disarranges the nervous harmonies of the system.

It is my professional conviction that if the use of this noxious drug could be effectually suppressed, the cases of headache would be very materially diminished. Another cause which I believe to be influential in the causation of headache, is the injurious tightness around the waist of the cadet uniform. I mention this with no wish to go beyond the limits of my peculiar province; but, satisfied as I am that it is a powerful predisposing and exciting cause of this complaint; I deem it my duty to embrace it in this communication. The erroneous notion that a small waist is essential to a correct military figure, seems to be very generally entertained by the corps. Hence, comfort is too often sacrificed to attain this, to them, most desirable object. The uniform coat is in a great many cases so confined in its dimensions around the waist that a mechanical obstacle is presented to the free play of the thoracic and abdominal organs. Hence result imperfect circulation through the chest and fullness of the vessels of the head, giving rise to headache, occasional feelings of vertigo, and other uncomfortable sensations. In addition, as a result of the same cause, we have
impeded action of the stomach and bowels, leading to constipation—itself a most efficient cause of headache. It is my conviction that if the waist measure of the cadet uniform were taken during a moderately full inspiration, so that their clothing would not produce injurious compression around the chest and abdomen, and the use of tobacco at the same time effectually suppressed, headache would nearly disappear from the corps. It is true that the exercise of the brain in the severe studies of the academy, for which many have but little natural aptitude, would occasionally produce it, but it would rarely attain that severity which would induce them to apply for relief from all duty, academic and military.

The next most common complaint appearing on the register is catarrh. This, depending on atmospheric changes, is but little subject to our control; but it is believed that it will be much less common when the cadets shall occupy the new barracks now in progress of erection, especially as they will have the benefit of occasional bathing, which, by its salutary action upon the skin, will unquestionably diminish the tendency to catarrhal disorders. Constipation is likewise a very frequent subject of complaint, and was referred to incidentally, whilst on the subject of headache, as standing in the relation of cause and effect with that very common complaint.

In addressing you, sir, it is not necessary to dwell on the influence of this form of functional derangement upon the moral, intellectual, and physical condition of man. There are few individuals who have not had a personal experience of its depressing influence over the powers of the mind, its saddening effects upon the spirits, and its enerating power over the physical health. When we reflect that it has its seat in that system of organs which, by their associated action, constitute the great laboratory in which are prepared all the elements for the building up and repair of the system, that any derangement of that system irradiates an unwholesome influence throughout the whole economy, its great importance in relation to individual hygiene will be at once appreciated. It is obvious that in the corps of cadets there are causes in operation very influential in producing the derangement under consideration. It has always been the bane of the student's life; and to obviate it, and insure a regular functional action, requires a religious observance of custom which few have the firmness to persist in.

So vitally important, however, do I deem it to be in relation to health, and so common is habitual constipation in the corps, that the question may be seriously entertained whether it is not the duty of those charged with the various interests of cadets to prescribe some regulations which might indirectly aid in the removal of this very common and distressing complaint. An enlarged view of our responsibilities to the young men here assembled, would certainly induce us to look to all their interests, moral, intellectual, and physical; and as they are at a period of life when habits are being formed which will tell for weal or wo upon their future career, it is certainly our duty to promote the formation of such as will best secure their own health and happiness, and render them most useful to the country for whose service they are educated. Constipation, I am satisfied, would not be so frequently complained of; if the use of tobacco were effectually suppressed; and it is believed that the addition to the cadet fare of stewed fruits three times a week would be of great advan-
tage in promoting that regular condition of the alimentary canal so vitally essential to the maintenance of general health.

Such an addition to their diet would, it is believed, measurably obviate that tendency to painful boils which interferes so frequently with their military duties.

Inflamed corns and excoriations of the feet mostly complete the catalogue of their ills. These depending in a great measure upon the faulty construction of their shoes, a diminution of them would speedily follow a more correct manufacture of that article of uniform. A superficial view of the matters above referred to might lead to the impression that they are but of little moment. But an experience of nearly four years at the Military Academy has satisfied me that the standing of many cadets is influenced by the facility with which they secure an excuse from duty for their many complaints, some of them of a very trifling character; a habit of running to the medical officer is contracted; studies are neglected at night because there is a "surgeon's call" in the morning to which they can flee for refuge. A slight headache, or a trifling feeling of indisposition, is sufficient to make them close their text books. This is, perhaps, the commencement of a retrograde movement in their studies: they proceed slowly, but surely, from bad to worse, until finally it is to be feared that, in some cases, painful as the supposition may be, deception is deliberately practised, in order to secure an excuse from duty. A cadet who can so far forget himself as to practise such deception, surely should not be deemed a person fit to hold a commission in his country's service. Let the provisional code of honor established for his guidance, and as a shelter for his conscience, be what it may, the practice of such deception evinces a perversion of the moral sense which augurs no good for the future.

I look upon our whole system as radically defective. "Surgeon's call" is plainly an inducement for the indolent to indulge their indolence. "Sick in quarters" is an absurdity which should no longer be tolerated. With our present box of a hospital, it cannot be otherwise. There should be constructed a building on the proper plan, large enough to accommodate the maximum number of sick. Every cadet who reports sick should at once be sent to hospital, and there remain until fit for duty. All unnecessary visiting to sick cadets should be positively forbidden. In case of serious illness of a cadet, the presence of his select friends would be always permitted, to comfort and nurse him. If such a system were established, I am satisfied it would exert a salutary influence. They—and, unfortunately, there are some, who avail themselves of an excuse from duty to pursue their own pleasures—would avoid the confinement of a hospital. The really sick would gladly seek the comfort and repose of a well regulated establishment. If any reported sick without cause, they could be safely subjected to the treatment appropriate to the sickness of which they complain. There would be nothing harsh in this system, and I am persuaded that it would speedily commend itself to the good sense of the corps.

I know, for a certainty, that there have been sensitive and highly organized young gentlemen at the institution who have suffered from indisposition for fear of being confounded with those who they knew were trifling.

When it is considered that, during each quarter of the year, some four
hundred and fifty report sick, and this in a corps every individual of which undergoes a strict physical examination previous to admission, and at a post notorious for its salubrity, the suggestions I have made will not be deemed unworthy of consideration. I am convinced that great benefit would result from a change of system; that much precious time would be saved to the cadets; that habits of indolence would not be so frequently contracted, and that many who, under the present system, are forming habits which may tell most unfavorably upon their prospects of success, would take a stand honorable to themselves, and creditable to the institution of which they are members. The position of a medical officer at West Point is one of great delicacy; he has to deal professionally with a large number of young men of various dispositions, temperaments, and moral feelings, who have left their homes and entered upon untried and trying duties. They must be treated with firmness, yet with kindness. Great allowances should be made and are made for them. But experience unfortunately teaches that some will deliberately deceive and impose upon the medical officers of the post. How to discriminate the innocent from the guilty is a most difficult matter. If the approaches of disease were not often insidious, but always assumed a distinguishable garb, our embarrassment would not be so painful. As it is, our duty plainly is to err on the side of safety; but in so doing, I am satisfied we indirectly encourage habits which militate powerfully against the success of many cadets at this institution. Were the proposed modification adopted, so far as allowing none to be "sick in quarters," and placing every one reporting sick immediately under hospital surveillance, the difficulty would be in a great measure obviated. It had been my intention to touch upon some other matters which appertain to my department; but this communication has been already so extended as to trespass, I fear, upon your time.

After a long delay, justice has at length been done to the enlisted men at this post. An appropriation for the building of a hospital has been secured, which it is hoped will soon be used in its construction. I have latterly most painfully felt the want of suitable accommodations for the sick soldier, who is as fairly entitled to them as a cadet or a commissioned officer.

A severe epidemic of small pox appeared last winter in miserably crowded barracks, during the prevalence of which, for four weeks, I was compelled to breathe the concentrated poison of virulent small pox. My own personal exposure was a matter of small moment compared with the amount of suffering I witnessed at that time, which I felt was much aggravated by the want of suitable accommodations for the sick.

I cannot conclude without alluding to the growing evil of the vast accumulation of families in Logtown and Camptown, dependencies of this post. Every enlisted man feels himself privileged to get married, and no check or limit is opposed to it. The consequence is, that the quarters are crowded with women and children—the latter, from the very necessity of the case, feeble and unhealthy. The humanity of the medical officers is painfully taxed in giving medical attendance to so many who have no official claims upon them; and their time, which is clearly their own when not officially employed, is so cut up that no systematic course of study can be prosecuted with a view to professional improvement. But this is part only of the evil resulting from the existing state of things. I am
convinced that contagious and infectious diseases have been occasionally introduced at West Point through the visits of acquaintances and friends of the families of enlisted men; these acquaintances and friends frequently levying an additional tax upon the time and attentions of the surgeon and assistant surgeon of the post. The commencement of this evil dates very far back, and no one now at the academy can be considered responsible for it; but it has now attained such dimensions as imperiously to demand the pruning-knife of reform. The surgeon and assistant surgeon are prepared to respond to all reasonable calls upon their humane feelings; but there is a limit beyond which endurance ceases to be a virtue, and it is time for them to act in self-defence. In justice to myself, and those who may succeed me at this post, I would suggest either that the number of families of enlisted men at this post should be reduced to the legal standard; or, if it should be deemed expedient that all now present should remain and an increase still encouraged, that medicines and suitable medical attendance be provided for them out of the funds of the Military Academy. The duties of medical officers at West Point are sufficiently arduous without having extra burdens imposed on them; and simple justice requires that some steps should be taken, if not to diminish the evil complained of, at all events to arrest its further progress.

I have the honor to be, with high respect,

ROBERT SOUTHGATE,
Assistant Surgeon U. S. A., acting Surgeon Military Academy.

Dr. H. Houghton,
Chairman of the Committee on Police, &c.

Of the Fiscal Affairs.

The undersigned committee, appointed by the “board of visitors,” to investigate and report upon the fiscal concerns of the United States Military Academy, respectfully report:

That, in accordance with the duty imposed upon them, they proceeded to make such inquiries, at the proper offices connected with the academy, as were naturally indicated by their appointment; and have the pleasure to state, that in the discharge of their functions they have received from every department and from the several officers in charge every facility of investigation, accompanied on their part by a deportment and civility becoming the officers of such an institution, beyond which in commendation nothing need be said.

The information sought has been developed under three distinct branches; that of the engineer department, the quartermaster’s, and the treasurer’s.

The engineer department has charge of the erection of the new barracks, and the disbursements necessary therefor.

The appropriations by the government for this purpose, up to the 30th June, 1849, make the aggregate amount of $107,500 00

Add to this the amount appropriated for the fiscal year ending 30th June, 1850 40,000 00

Making 147,500 00
The amount of the appropriations expended to the 1st of June, 1849, was $102,380.28

Leaving an amount of former appropriations remaining on hand on the 1st June, 1849, of 45,119.72

Although your committee are aware that the completion of the new barracks is not a subject strictly within their purview, they cannot refrain from expressing their opinion upon the excellence of the work—now so far advanced as to afford accommodation for 18 subaltern officers and 128 cadets, besides an office for the commandant of cadets, guard rooms, bathing establishments, &c. The building, so far as erected, your committee conceive to be worthy of the United States. Built of hewn granite and elegant in its architectural proportions, it is light, airy, every way convenient, and by reason of any common casualty indestructible.

There is yet required for the completion of these barracks, and the necessary outbuildings, agreeably to the estimate of the engineer, the further sum of $48,500; and we would suggest to the board, therefore, an urgent recommendation to Congress for a speedy appropriation for the completion of the work. When finished agreeably to the plan designed, it will accommodate 128 cadets more, and furnish a large hall for the Dialectic Society connected with the institution.

The department of the quartermaster exhibits the amount of appropriations for the academy, (not including the pay of the cadets,) and the disbursements of the same; being for repairs and improvements of the buildings, fuel, apparatus, forage, postage, stationery, &c.

Added to these are the miscellaneous and incidental expenditures of the different departments of engineering, mathematics, philosophy, chemistry, &c., all of which are particularly set forth in the paper (marked A) herewith submitted to the board.

The aggregate amount of appropriations for the fiscal year ending June 30, 1849, is $31,655; in addition to this there was unexpended at the close of the fiscal year the sum of $2,374.62; of this amount there is unexpended and available for the residue of the fiscal year $9,132.78.

These appropriations your committee regard as wisely made, prudently expended, and essential to the interests and prosperity of the academy.

All the items of expenditure are subjected to rigid investigation, even to the passing of every individual account. The vouchers of disbursements from the quartermaster’s office are forwarded to the office of the Chief Engineer, at Washington city, where they are critically examined; after which they are sent to the Third Auditor and again examined; then to the Second Comptroller for adjustment, by whom they are returned to the Third Auditor, in whose office they are retained; and if not found correct, a statement of differences or errors is immediately forwarded to the office here for explanation or correction.

The treasurer’s office exhibits the disbursement of the pay of the cadets. The pay of the cadet is $24 per month without rations, and the disbursements embrace his board, clothing, and incidental expenses of every kind.

Each cadet on entering the institution is required to deposite his money on hand with the treasurer, for which he receives a check and credit upon his account. And thereafter the cadet is not allowed to be supplied with
pocket money or funds from home or elsewhere, for any purpose whatever, except with the approbation of the superintendent, who has the personal inspection and control of the expenditures of each individual cadet, however small.

All the members of the institution, whether rich or poor, are thus placed upon an equality. All the wants of the cadet are cared for and supplied to the extent of their means, but all supplies are furnished under the discretion and order of the superintendent. The further operation of this rule is not only to exclude all unnecessary and improper indulgences, but to inculcate and enforce those principles of rigid economy not more essential to the welfare of the individual, than to the character of every one intrusted with the concerns of others, and more especially the financial interests of the government, however humble the sphere in which he may be called to act.

Paper B, hereto also appended, sets forth the various items, or branches of expenditure, absorbing the pay of the cadet. It is an exhibit of the settlement of accounts every two months, and running through an entire year from the 1st May, 1848, to 1st May, 1849. From this is readily obtained the average monthly expenses of board, clothing, and incidentals, arranged under the respective heads, of the whole corps of cadets, and the average amount for two months paid and retained from each, the whole number being 230.

So far as the mode of keeping the accounts in this department is concerned, your committee cannot but regard it as well ordered and effective, presenting proper aggregate results and accurate in detail; but, from their investigations in the treasurer's department, they are satisfied that the pay of cadets, under their present expenditures, is generally insufficient for their support. A large portion of the cadets, notwithstanding the most rigid economy and the constant and careful supervision of the superintendent, find themselves in debt more or less at the close of their academic career.

This committee therefore hope that the committee of administration, who have this subject under their special charge, may be able to report some method by which the boarding of the cadets may be reduced in price, without reducing its quality or abridging in any way the comforts of the corps.

If this should be thought impracticable, your committee are decidedly of opinion that the board of visitors should recommend the restoration of the former pay of the cadets, which is understood to have been $28 per month.

All which is respectfully submitted.

JNO. L. GOW,
JEROME FULLER, Fiscal Committee.
H. HOUGHTON,

West Point, June 13, 1849.
Statement of funds available and disbursements made by Captain Henry Brewerton, Corps of Engineers, Superintendent United States Military Academy, for the fiscal year ending June 30, 1849.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair and improvements</td>
<td>$527 91</td>
<td>$3,000 00</td>
<td>$36 14</td>
<td>$9,586 65</td>
<td>$7,700 91</td>
<td>$1,886 96</td>
<td>$1,173 55</td>
<td>$712 42</td>
</tr>
<tr>
<td>Fuel and apparatus</td>
<td>7,200 00</td>
<td>637 89</td>
<td>7,837 89</td>
<td>5,426 63</td>
<td>2,412 25</td>
<td>750 00</td>
<td>1,627 26</td>
<td></td>
</tr>
<tr>
<td>Forage</td>
<td>1,700 00</td>
<td>22 43</td>
<td>1,722 43</td>
<td>1,241 06</td>
<td>481 35</td>
<td>481 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postage</td>
<td>50 00</td>
<td>50 00</td>
<td>50 00</td>
<td>22 37</td>
<td>27 69</td>
<td>8 00</td>
<td>19 69</td>
<td></td>
</tr>
<tr>
<td>Stationery</td>
<td>1,500 00</td>
<td>17 18</td>
<td>1,517 18</td>
<td>1,207 96</td>
<td>488 22</td>
<td>100 00</td>
<td>64 22</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>1,500 00</td>
<td>1,500 00</td>
<td>1,500 00</td>
<td>58 58</td>
<td>43 50</td>
<td>64 50</td>
<td>365 00</td>
<td></td>
</tr>
<tr>
<td>Print ng</td>
<td>1,730 00</td>
<td>40 00</td>
<td>1,770 00</td>
<td>1,502 49</td>
<td>567 51</td>
<td>227 51</td>
<td>40 00</td>
<td></td>
</tr>
<tr>
<td>Clerks</td>
<td>1,730 00</td>
<td>40 00</td>
<td>1,770 00</td>
<td>1,502 49</td>
<td>567 51</td>
<td>227 51</td>
<td>40 00</td>
<td></td>
</tr>
</tbody>
</table>
| Miscellaneous and inci-
| dential               | $1,400 84 | 1,140 00 | 4 62 | 2,545 46 | 2,457 80 | 87 66 | 28 62 | 59 04 |
| Department of engineering | 150 00 | 150 00 | 150 00 | 98 81 | 51 19 | 51 19 |
| Department of philosophy | 370 00 | 370 00 | 370 00 | 370 00 | 370 00 | 370 00 |
| Department of mathematics | 370 00 | 370 00 | 370 00 | 370 00 | 370 00 | 370 00 |
| Department of chemistry, | 2,500 00 | 2,500 00 | 2,500 00 | 2,321 92 | 178 08 | 3 00 | 175 08 |
| mineralogy, and geol.  | 100 00 | 100 00 | 100 00 | 30 00 | 70 00 | 70 00 |
| Department of ethics    | 310 00 | 310 00 | 310 00 | 15 53 | 294 47 | 200 00 | 94 47 |
| Department of drawing   | 310 00 | 310 00 | 310 00 | 310 00 | 310 00 | 310 00 | 310 00 |

For purchase of models.
For repairs of apparatus, &c.
For purchase of theodolite, &c.
For purchase of chemicals.
For purchase of maps, &c.
For purchase of models.

Remarks:
For purchase of models, For repairs of apparatus, &c.
For purchase of theodolite, &c.
For purchase of chemicals.
For purchase of maps, &c.
For purchase of models.
| Department of artillery and cavalry | 2,203 00 | 2,203 00 | 19 14 | 2,189 86 | 2,188 86 | $2,000 for a gun shed. 
| Department of fencing | 200 00 | 200 00 | 57 22 | 142 78 | 45 58 | For purchase of foils, gloves, and masks. 
| Department of infantry tactics | 577 00 | 577 00 | 145 53 | 461 47 | 461 47 | For purchase of fire engine, hose, &c. 
| Gradual increase and expense of library | 445 87 | 1,500 00 | 1,945 87 | 265 19 | 1,680 69 | 8 60 | 1,671 88 | Will be expended the present summer. |

**UNITED STATES MILITARY ACADEMY, West Point, New York, June 11, 1849.**

To John L. Gow, Esq.,
  President Finance Committee, Board of Visitors.

HEN. BREWERTON
  Captain Corps of Engineers, Superintendent Military Academy.
Statement of authorized amounts paid the following by the treasurer of the United States Military Academy, on account of cadets, from May 1, 1848, to May 1, 1849.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Purveyor of cadets' commons</td>
<td>$4,079.20</td>
<td>$4,106.35</td>
<td>$4,410.04</td>
<td>$4,627.65</td>
<td>$4,265.79</td>
<td>$4,178.93</td>
<td>$25,667.96</td>
<td>$4,277.97</td>
<td>$18.59</td>
</tr>
<tr>
<td>Storekeeper</td>
<td>1,282.02</td>
<td>2,260.22</td>
<td>1,862.46</td>
<td>1,388.09</td>
<td>1,202.47</td>
<td>1,028.25</td>
<td>9,155.50</td>
<td>1,625.91</td>
<td>6.63</td>
</tr>
<tr>
<td>Commissary of cadets' clothing</td>
<td>1,568.63</td>
<td>4,477.23</td>
<td>1,949.68</td>
<td>1,674.81</td>
<td>1,575.85</td>
<td>1,439.02</td>
<td>12,717.24</td>
<td>2,119.54</td>
<td>9.21</td>
</tr>
<tr>
<td>Shoemaker</td>
<td>381.42</td>
<td>922.87</td>
<td>547.11</td>
<td>475.27</td>
<td>368.15</td>
<td>273.43</td>
<td>2,959.25</td>
<td>488.20</td>
<td>2.15</td>
</tr>
<tr>
<td>Barber, shoe-blackening, and varnishing</td>
<td>176.66</td>
<td>164.29</td>
<td>170.83</td>
<td>165.12</td>
<td>150.26</td>
<td>116.68</td>
<td>936.03</td>
<td>168.00</td>
<td>2.19</td>
</tr>
<tr>
<td>Postage</td>
<td>237.69</td>
<td>244.82</td>
<td>261.32</td>
<td>235.13</td>
<td>227.37</td>
<td>204.19</td>
<td>1,647.63</td>
<td>274.58</td>
<td>1.99</td>
</tr>
<tr>
<td>Making fires and policing barracks of cadets</td>
<td>99.71</td>
<td>69.33</td>
<td>142.58</td>
<td>207.86</td>
<td>198.64</td>
<td>177.65</td>
<td>1,905.67</td>
<td>350.94</td>
<td>6.5</td>
</tr>
<tr>
<td>Baths used by cadets</td>
<td>25.87</td>
<td>53.69</td>
<td>77.95</td>
<td>74.50</td>
<td>205.50</td>
<td>62.50</td>
<td>915.48</td>
<td>4.0</td>
<td>9.25</td>
</tr>
<tr>
<td>Damages of pubic property</td>
<td>927.89</td>
<td>896.12</td>
<td>981.91</td>
<td>960.82</td>
<td>883.55</td>
<td>862.98</td>
<td>5,431.47</td>
<td>913.57</td>
<td>3.37</td>
</tr>
<tr>
<td>Washing done for cadets</td>
<td>924.00</td>
<td>948.00</td>
<td>980.00</td>
<td>936.00</td>
<td>880.00</td>
<td>868.00</td>
<td>5,556.00</td>
<td>926.00</td>
<td>4.09</td>
</tr>
<tr>
<td>Equipment fund (retained by treasurer)</td>
<td>410.62</td>
<td>1,081.08</td>
<td>447.76</td>
<td>466.53</td>
<td>266.23</td>
<td>235.58</td>
<td>2,029.90</td>
<td>504.98</td>
<td>2.19</td>
</tr>
<tr>
<td>Miscellaneous payments</td>
<td>7,611.60</td>
<td>528.58</td>
<td>208.18</td>
<td>311.88</td>
<td>391.41</td>
<td>339.03</td>
<td>9,632.78</td>
<td>1,605.46</td>
<td>6.98</td>
</tr>
<tr>
<td>Balance paid, cadets when graduating or resigning</td>
<td>20,758.31</td>
<td>15,460.38</td>
<td>12,035.00</td>
<td>11,624.58</td>
<td>10,883.60</td>
<td>10,140.48</td>
<td>72,049.30</td>
<td>13,040.89</td>
<td>6.56</td>
</tr>
</tbody>
</table>

* The miscellaneous payments embrace the "lithographic fund," "rules and trigonals fund," "Dialectic Society fund," "the use of cap-plates and plume," "band fund," being a stoppage of twenty-five cents per month; the use of iron bedsteads and tables, twenty cents per month; change for the fourth class only; and dentists, dancing-master, subscription to newspaper, &c.

Treasurer's Office, West Point, N. Y., June 9, 1849.

B. S. Alexander,
Lieutenant of Engineers and Treasurer of Military Academy.
Tabular statement exhibiting the condition in life of the cadets at the Military Academy, West Point, for the last seven years, from 1842 to 1848, inclusive.

<table>
<thead>
<tr>
<th>Parents are or were farmers or planters</th>
<th>1842</th>
<th>1843</th>
<th>1844</th>
<th>1845</th>
<th>1846</th>
<th>1847</th>
<th>1848</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents are or were mechanics</td>
<td>59</td>
<td>61</td>
<td>61</td>
<td>68</td>
<td>72</td>
<td>67</td>
<td>69</td>
</tr>
<tr>
<td>Parents are or were lawyers or judges</td>
<td>14</td>
<td>13</td>
<td>15</td>
<td>22</td>
<td>22</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Parents are or were merchants</td>
<td>27</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>33</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Parents are or were boarding-house or hotel keepers</td>
<td>18</td>
<td>15</td>
<td>22</td>
<td>22</td>
<td>23</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Parents are or were physicians</td>
<td>24</td>
<td>27</td>
<td>23</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Parents are or were of the army, navy, or marine corps</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Parents are or were clerks</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>13</td>
<td>11</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Miscellaneous, such as bankers, editors, professors, engineers, masters of vessels, &amp;c.</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Occupation not stated: these have mothers only, or no parents</td>
<td>48</td>
<td>54</td>
<td>54</td>
<td>44</td>
<td>44</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>212</td>
<td>224</td>
<td>236</td>
<td>241</td>
<td>232</td>
<td>242</td>
</tr>
<tr>
<td>Of these numbers, there are without fathers living</td>
<td>26</td>
<td>57</td>
<td>44</td>
<td>48</td>
<td>43</td>
<td>41</td>
<td>54</td>
</tr>
<tr>
<td>Of these numbers, there are without either father or mother living</td>
<td>22</td>
<td>16</td>
<td>18</td>
<td>15</td>
<td>21</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>Total orphans</td>
<td>48</td>
<td>73</td>
<td>62</td>
<td>63</td>
<td>63</td>
<td>61</td>
<td>72</td>
</tr>
<tr>
<td>Of these numbers, the parents are stated to be in moderate circumstances, of</td>
<td>182</td>
<td>156</td>
<td>160</td>
<td>164</td>
<td>192</td>
<td>162</td>
<td>193</td>
</tr>
<tr>
<td>Of these numbers, the parents are stated to be in reduced circumstances, of</td>
<td>26</td>
<td>26</td>
<td>37</td>
<td>36</td>
<td>35</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>Of these numbers, the parents are stated to be in indigent circumstances, of</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Of these numbers, the parents are stated to be independent in life, of</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Of these numbers, the parents are stated to be in unknown circumstances, of</td>
<td>39</td>
<td>18</td>
<td>19</td>
<td>16</td>
<td>8</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Total orphans</td>
<td>221</td>
<td>212</td>
<td>224</td>
<td>236</td>
<td>241</td>
<td>232</td>
<td>242</td>
</tr>
</tbody>
</table>

* Two of these have parents.

† Three have parents.
Minutes of the proceedings of the Board of Visitors at West Point, June, 1849.

First Day.

West Point, Monday, June 4.

The board of visitors invited to attend the annual examination at West Point Military Academy having convened at the hotel, at 10 a. m., the following members appeared and took their seats:

- John H. B. Latrobe, of Maryland.
- J. McCaleb Wiley, of Alabama.
- Jerome Fuller, of New York.
- Henry S. Bullard, of Louisiana.
- John F. Gow, of Pennsylvania.
- William T. Stockton, of Florida.
- Rufus King, of Wisconsin.
- Henry Houghton, of Iowa.

On motion of General Wiley, of Alabama, the board was temporarily organized by the appointment of

- John H. B. Latrobe, of Maryland, president pro tem.;
- Rufus King, of Wisconsin, secretary pro tem.

The board was then waited upon by the superintendent and the members of the academic staff, and, attended by them, proceeded to examine the library, barracks, recitation rooms, mess hall, and other buildings connected with the institution. They afterwards received the honors of a military review, and partook of the hospitalities of the superintendent's mansion.

In the afternoon a communication was received from the post adjutant, covering a copy of the order of exercises for the annual examination; which was laid before the board for their information and government.

RUFUS KING, Secretary.

Second Day.—Tuesday, June 5, 1849.

The board met at 8 a. m., in the visitors' room at the hotel.

Messrs. R. W. Burnet, of Ohio, Daniel Tyler, of Connecticut, Horace Mann, of Massachusetts, and P. M. Henry, of North Carolina, appeared and took their seats as members of the board.

The president pro tem. announced as the first business in order the selection of officers.

Whereupon,

On motion of Mr. Mann, it was unanimously

Resolved, That John H. B. Latrobe, of Maryland, be chosen president, and Rufus King, of Wisconsin, secretary of the board.

The board then proceeded to the library, where the first class was examined, from 9 a. m. until 1 p. m., and from 3 to 5 p. m., in military and civil engineering, under direction of Professor Mahan and Lieutenant Eustis.

8 o'clock p. m.

The board met pursuant to a notice from the president.

On motion of Mr. Fuller, it was
Resolved, That committees of three each be appointed, to whom shall be referred the subjects, respectively, of the instruction, administration, police, discipline, and fiscal affairs of the Military Academy, with instructions to examine and report upon the same, in writing, to the board.

In accordance with the foregoing resolution, the president announced the following standing committees:

Committee on Instruction.—Messrs. Mann, Bullard, and King.
Committee on Administration.—Messrs. Tyler, Burnet, and Gow.
Committee on Police.—Messrs. Houghton, Stockton, and Burnet.
Committee on Discipline.—Messrs. Wiley, King, and Henry.
Committee on Fiscal Affairs.—Messrs. Gow, Fuller, and Houghton.

On motion of Mr. Mann, it was unanimously

Resolved, That it would be agreeable to the views and wishes of this board to have the regulation prohibiting the use of intoxicating liquors in the hotel, extended to the room occupied by them.

On motion of General Wiley, it was

Resolved, That regular meetings of the board be held, daily, at 8 a.m. and 8 p.m., until otherwise ordered.

Adjourned.

RUFUS KING, Secretary.

THIRD DAY.—Wednesday, June 6, 8 a.m.

The board met pursuant to rule.
The minutes of the last meeting were read and approved.

There being no business before them, the board proceeded to the library, where the examination of the first class in engineering was concluded, and that of the second class in philosophy, under the direction of Professor Bartlett and Lieutenant Roberts, was commenced and continued, with the usual intermission, until 5 p.m.

At a quarter past 5, the board attended a light artillery drill by the first class, under the charge of Captain Clark.

8 o'clock p.m.

The board met pursuant to rule.
The minutes of the last meeting were read and approved.

Colonel A. H. Kenan, of Georgia, appointed in lieu of General Clinch, who declined, appeared and took his seat as a member of the board, and was appointed a member of the committee on administration, in the place of Mr. Gow.

Adjourned.

RUFUS KING, Secretary.

FOURTH DAY.—June 7, 8 a.m.

The board met pursuant to rule.
The minutes of the last meeting were read and approved.

There being no other business before them, the board proceeded to the library, where the examination of the second class in philosophy was resumed, and continued till the usual hour of adjournment.
The board met again at 8 p. m., and after a brief session, adjourned till 8 a. m., to-morrow.

RUFUS KING, Secretary.

FIFTH DAY.

The board met pursuant to rule.
The minutes of yesterday’s meeting were read and approved.
The board then proceeded to the library, where the examination of the second class in philosophy was resumed and concluded, and that of the first class in ethics, under charge of the Reverend Mr. Sprake and Lieutenant Deshon, was commenced and continued till the usual hour of adjournment.
The board next attended the riding exercise of the first class.

8 o’clock p. m.

The board met pursuant to rule.
The minutes of last meeting were read and approved.
The president announced the classification of subjects for the consideration of the different committees.

On motion of Mr. Mann, it was
Resolved, That the superintendent be respectfully requested, at as early a period as may be practicable and convenient, to call the first class of cadets into the drawing academy, and there inform them that they are expected forthwith, under the charge of a suitable person deputed for the purpose, and in his presence, each for himself, and without advice or assistance from any other person, to date, address, write, subscribe, fold and superscribe a letter, of not less than one letter-paper page in length, on whatever subject the writer may himself select, and address the same to the president of the board of visitors.

Resolved, That the time allowed for preparing the letters, as above described, be one half hour.

Resolved, That the president of the board be charged with the execution of these resolves.

On motion of Mr. Fuller, it was
Resolved, That the board will pay their respects, in a body, to Major General Scott, of the U. S. army, at 12 m., to-morrow.

Adjourned.

RUFUS KING, Secretary.

SIXTH DAY.

The board met pursuant to rule.
The minutes of yesterday’s meeting were read and approved.
The board then proceeded to the library, where the examination of the first class of ethics was concluded, and that of the third class in mathematics, under charge of Professor Church, was commenced and continued till 1 p. m., when the examination was adjourned over till 9 a. m., Monday.

At 12 m., the board, pursuant to resolution adopted yesterday, waited in a body upon General Scott, and were received by him with great cordiality. Before leaving the library the president of the board received from
the adjutant the letters written by the first class, in conformity with the resolution adopted last evening.

The board re-assembled at 8 p. m., and there being no business before them, adjourned over till 8 a. m., Monday next.

RUFUS KING, Secretary.

Eighth Day.—Tuesday, June 12, 8 a. m.

The board met pursuant to rule.
The minutes of yesterday's meeting were read and approved.

On motion of Mr. Tyler, it was

Resolved, That a general report be prepared by the board, to which the reports of the several committees be added by way of appendix.

Mr. Abbott, of Maine, who arrived yesterday, appeared and took his seat as a member of the board, and was assigned to duty on the committee on administration, in lieu of Mr. Burnett.

The board then proceeded to the library, where the examination of the third class in mathematics was resumed and concluded, and that of the first class in mineralogy and geology, under Professor Bailey and Lieutenant Clarke, commenced, and completed at 4½ p. m.

At 5½ p. m., the board, by invitation, attended a ponton drill by the company of sappers and miners, under command of Captain Callum and Brevet Captain McClelland.

8 o'clock p. m.

The board met pursuant to rule.

There being no business before them, the board, after a discussion of various matters relating to the institution, adjourned till 8 a. m., to-morrow.

RUFUS KING, Secretary.
NINTH DAY.—Wednesday, June 13, 8 a. m.

The board met pursuant to adjournment.

The minutes of yesterday's meeting were read and approved.

Mr. Gow, from the committee on fiscal affairs, reported at length upon the matters referred to them; which report was unanimously adopted.

There being no other business before them, the board then adjourned to the library, where the examination of the fourth class in mathematics, under the charge of Professor Church and assistants, was commenced and continued, with the usual intermission, until 5 p. m.

At 8 p. m., the board met, and having no business before them, adjourned till 8 a. m., to-morrow.

RUFUS KING, Secretary.

TENTH DAY.—Thursday, June 14, 8 a. m.

The board met pursuant to adjournment.

The minutes of the last meeting were read and approved.

Mr. Mann, from the committee on instruction, submitted a report, which was unanimously adopted.

After a brief discussion of various matters relating to the institution, the board adjourned to the library, where the examination of the fourth class in mathematics was concluded, and that of the first class in tactics was commenced and continued till 5 p. m.

At 11 a. m., the board attended the cavalry drill, and at 5 p. m., artillery practice by the first class.

8 o'clock p. m.

The board met pursuant to rule.

Leave of absence was granted to Colonel Kenan for the remainder of the session. Mr. Fuller was placed upon the committee on administration, in lieu of Colonel Kenan.

Mr. Houghton, from the committee on police, submitted a report, which was unanimously adopted.

Mr. Henry, from the committee on discipline, submitted a report, which was unanimously adopted.

Adjourned.

RUFUS KING, Secretary.

ELEVENTH DAY.—Friday, June 15, 8 a. m.

The board met pursuant to rule.

Minutes of yesterday's meeting read and approved.

Mr. Tyler, from the committee on administration, submitted a report, which was unanimously adopted.

The board then proceeded to the library, where the examination of the first class in tactics was resumed and concluded.

At 5 p. m., the board attended the mortar practice of the first class, and at 8 p. m. had the pleasure of listening to an address delivered before the corps of cadets, by the honorable Horace Mann.

Adjourned.

RUFUS KING, Secretary.
Twelfth Day.—Saturday, June 16, 8 a. m.

The board met pursuant to rule.
The minutes of yesterday's meetings were read and approved.
The president submitted the draught of the general report of the board, which was read, considered, and laid on the table until this evening.
The board then proceeded to attend the examination of the third class in French, under the charge of Professor Agnel.
At 11 a. m., the board was present at a review of the corps by Major General Scott; also, at 12 m., attended a drill of the sappers and miners.

8 o'clock p. m.

The board met; and minutes of last meeting were read and approved.
A letter was received from Dr. Southgate, acting surgeon of the post, which was read and ordered to be included in the documents accompanying the general report; as was also a table showing the condition in life of the cadets; at the time of their appointment, for each year during the last seven years.

On motion of Mr. Gow, it was unanimously
Resolved; That the thanks of the board be and they are hereby presented to the president and secretary, for the fidelity and urbanity with which they have discharged their respective duties.

Adjourned till 8 a. m., Monday.

RUFUS KING, Secretary.

Thirteenth Day.

The board met pursuant to adjournment.
The minutes of the last meeting were read and approved.
The general report of the board was called up, adopted, and signed by all the members.
The board then proceeded to the library and academic building, where they attended the examination of the third class in French and the fencing exercise of the first class.
At 1 p. m., the board, having completed their business, after a session (Sundays included) of fifteen days, adjourned sine die.

RUFUS KING, Secretary.

The average amount of cadets' board at cadets' commons at West Point, N. Y., from March 1, 1837, to May 1, 1849.

<table>
<thead>
<tr>
<th>Month</th>
<th>1, 1837, to December 31, 1837</th>
<th>1, 1838, to 31, 1838</th>
<th>1, 1839, to 31, 1839</th>
<th>1, 1840, to 31, 1840</th>
<th>1, 1841, to 31, 1841</th>
<th>1, 1842, to 31, 1842</th>
<th>1, 1843, to 31, 1843</th>
<th>1, 1844, to 31, 1844</th>
<th>1, 1845, to 31, 1845</th>
<th>1, 1846, to 31, 1846</th>
<th>1, 1847, to 31, 1847</th>
<th>1, 1848, to 31, 1848</th>
<th>1, 1849, to April 30, 1849</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>11, 12</td>
<td>11, 08</td>
<td>10, 10</td>
<td>8, 54</td>
<td>8, 75</td>
<td>8, 54</td>
<td>8, 08</td>
<td>7, 91</td>
<td>9, 08</td>
<td>8, 87</td>
<td>9, 18</td>
<td>9, 24</td>
<td>9, 50</td>
</tr>
</tbody>
</table>
The cadets boarded by Jacob H. Holt from the 1st of April, 1837, to the 30th of April, 1839, and by William H. Clark since the 1st of May, 1839. Average amount of board by J. H. Holt, $10.76. Average amount of board by W. H. Clark, $8.76.

Mr. Holt made an error against himself on account of cadets' board, which was recharged them, making the amount of board as above stated.

Under Colonel R. E. De Russy's administration from March 1, 1837, to September 1, 1838.

Under Major R. Delafield's administration from September 1, 1838, to August 14, 1845.

Under Captain H. Brewerton's administration from August 14, 1845.

### Statement of the number of cadets that boarded at the mess commons, from May 1, 1848, to May 1, 1849, and the amount audited by the board of survey during the same periods, together with the amount of cash received by the purveyor for sale of hides, tallow, bread, &c., credited the account of cadets' commons on the books of the treasurer's office, at West Point, New York.

<table>
<thead>
<tr>
<th>Number of Cadets</th>
<th>Number of Cadets Absent</th>
<th>Number of Cadets Present</th>
<th>Number of Cadets Boarding at M. Thompson's</th>
<th>Total Number of Cadets Boarding in Mess Commons</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1848</td>
<td>233</td>
<td>3</td>
<td>230</td>
<td>12</td>
</tr>
<tr>
<td>June 1848</td>
<td>229</td>
<td>113</td>
<td>116</td>
<td>12</td>
</tr>
<tr>
<td>June 1848</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1848</td>
<td>249</td>
<td>63</td>
<td>186</td>
<td>12</td>
</tr>
<tr>
<td>August 1848</td>
<td>253</td>
<td>63</td>
<td>189</td>
<td>12</td>
</tr>
<tr>
<td>Sept. 1848</td>
<td>257</td>
<td>11</td>
<td>246</td>
<td>12</td>
</tr>
<tr>
<td>Oct. 1848</td>
<td>256</td>
<td>13</td>
<td>243</td>
<td>12</td>
</tr>
<tr>
<td>Nov. 1848</td>
<td>246</td>
<td>5</td>
<td>241</td>
<td>12</td>
</tr>
<tr>
<td>Dec. 1848</td>
<td>241</td>
<td>6</td>
<td>235</td>
<td>12</td>
</tr>
<tr>
<td>Jan. 1849</td>
<td>237</td>
<td>19</td>
<td>218</td>
<td>12</td>
</tr>
<tr>
<td>Feb. 1849</td>
<td>230</td>
<td>13</td>
<td>217</td>
<td>12</td>
</tr>
<tr>
<td>March 1849</td>
<td>226</td>
<td>10</td>
<td>216</td>
<td>12</td>
</tr>
<tr>
<td>April 1849</td>
<td>225</td>
<td>10</td>
<td>215</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total** 2,653 329 2,224 12 2,480

The average number for one month... 2461.12 275.12 2483.12 2068.12

### Days 75.43.

112 cadets absent from June 19, 1848, viz.: graduating class, 50; furlough class, 63. The average time of the arrival of new cadets at United States Military Academy, June 8, 1848.
To amount of cash received by the purveyor for the sale of hides, tallow, bread, &c., during the following months, credited the account of the cadets' commons on the books of the treasurer's office:

<table>
<thead>
<tr>
<th>Period</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>For May and June, 1848</td>
<td>$357 15</td>
</tr>
<tr>
<td>For July and August, 1848</td>
<td>300 00</td>
</tr>
<tr>
<td>For September and October, 1848</td>
<td>379 48</td>
</tr>
<tr>
<td>For November and December, 1848</td>
<td>303 02</td>
</tr>
<tr>
<td>For January and February, 1849</td>
<td>350 51</td>
</tr>
<tr>
<td>For March and April, 1849</td>
<td>333 16</td>
</tr>
<tr>
<td><strong>Total amount</strong></td>
<td><strong>2,023 32</strong></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>337 22</strong></td>
</tr>
</tbody>
</table>

To amount of board audited by the board of survey, from May 1, 1848, to April 30, 1849, viz:

<table>
<thead>
<tr>
<th>Period</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the months of May and June, 1848</td>
<td>$3,715 40</td>
</tr>
<tr>
<td>Do. July and August, 1848</td>
<td>3,427 38</td>
</tr>
<tr>
<td>Do. September and October, 1848</td>
<td>3,836 61</td>
</tr>
<tr>
<td>Do. November and December, 1848</td>
<td>4,076 18</td>
</tr>
<tr>
<td>Do. January and February, 1849</td>
<td>3,919 36</td>
</tr>
<tr>
<td>Do. March and April, 1849</td>
<td>3,726 65</td>
</tr>
<tr>
<td><strong>Amount</strong></td>
<td><strong>22,301 48</strong></td>
</tr>
<tr>
<td><strong>Average, two months</strong></td>
<td><strong>3,716 91 4</strong></td>
</tr>
</tbody>
</table>

Treasurer's Office, West Point, June 13, 1849.
Statement of balances due by and in favor of cadets United States Military Academy, on settlement of their accounts in treasurer's office from 1st May, 1848, to 30th April, 1849.

<table>
<thead>
<tr>
<th>Period</th>
<th>Storekeeper</th>
<th>Clothing department</th>
<th>Shoemaker</th>
<th>Treasurer</th>
<th>Total amount</th>
<th>Balance in favor of cadets</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>For May and June, 1848</td>
<td>$682 00</td>
<td>$1,059 36</td>
<td>$107 29</td>
<td>$16 27</td>
<td>$2,065 13</td>
<td>$966 10</td>
<td>The balance due by the cadets, excludes their &quot;equipment fund,&quot; that being a stoppage of $2 per month, which amount is reserved agreeably to article XI, Regulations of the United States Military Academy, and paid them when graduating, resigning, or being discharged from the Military Academy.</td>
</tr>
<tr>
<td>For July and August, 1848</td>
<td>1,650 26</td>
<td>2,066 67</td>
<td>211 90</td>
<td>2 89</td>
<td>4,131 72</td>
<td>1,066 73</td>
<td></td>
</tr>
<tr>
<td>For September and October, 1848</td>
<td>1,795 73</td>
<td>1,960 88</td>
<td>157 29</td>
<td></td>
<td>3,913 90</td>
<td>1,489 59</td>
<td></td>
</tr>
<tr>
<td>For November and December, 1848</td>
<td>1,376 31</td>
<td>1,431 81</td>
<td>115 92</td>
<td>13 05</td>
<td>2,947 09</td>
<td>1,796 45</td>
<td></td>
</tr>
<tr>
<td>For January and February, 1849</td>
<td>1,080 02</td>
<td>1,359 70</td>
<td>47 00</td>
<td></td>
<td>2,486 72</td>
<td>2,562 26</td>
<td></td>
</tr>
<tr>
<td>For March and April, 1849</td>
<td>882 31</td>
<td>1,042 57</td>
<td>27 31</td>
<td></td>
<td>1,905 19</td>
<td>2,385 21</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1,268 30</td>
<td>1,521 83</td>
<td>112 78</td>
<td>5 31</td>
<td>2,908 27</td>
<td>1,861 39</td>
<td></td>
</tr>
</tbody>
</table>

Treasurer's Office, West Point, N. Y., June 9, 1849.

B. S. Alexander,
Lieutenant Engineers and Treasurer Military Academy.
United States Military Academy,
West Point, N. Y., September 30, 1849.

SIR: In compliance with the circular of the department of the 15th ultimo, I have the honor to transmit herewith an estimate of funds required for the United States Military Academy for the fiscal year ending June 30, 1851.

The sums asked for a hospital for the enlisted men of the post, the new mess-hall, and riding-hall, are for the completion of those buildings, in addition to the grants already made by Congress for those objects. An appropriation of $3,000 is asked for the erection of a building for a permanent guard-house and commissary store, which is much needed at the post, having no proper building for that purpose. The amount asked for under the head of repairs and improvements is increased $2,000, the greater portion of this sum being necessary for a building to replace the old quarters recently occupying the site of the new mess-hall, and which has been demolished preparatory to constructing the latter building. In consequence of the number of halls in the new cadet barracks, the quantity of oil necessary for lighting will require to be very much increased, which has added considerably to the amount asked for under the head of miscellaneous and incidental expenses. The sum necessary to complete the new cadet barracks has not been included in this estimate, it having been usual for the officer having the immediate construction of the building to ask for such amounts as may be required from year to year. The western portion of the new barrack already completed, has been occupied by one-half the corps of cadets since the 31st ultimo. Although not included in my estimate, I would recommend an appropriation of $2,500 for apparatus, and making the necessary alterations for warming the academic building, the library, and chapel, by heated air. This, besides being more economical in the end, would add much to the police of the buildings, and make them more safe as to fire.

All which is very respectfully submitted.

HEN. BREWERTON,
Captain Corps Engineers, Superintendent Military Academy.

Brig. Gen. Jos. G. TOTTEN,
Chief Engineer, Washington, D. C.


San Antonio, June 10, 1849.

Gen. J. G. TOTTEN, Chief Engineer of the United States:

General: The party organized by order of General Worth as an escort to Lieutenant Smith, topographical engineer, and myself, on our reconnaissance to El Paso, and under my command, consisted of nine men, regarded as well versed in frontier life and experienced as woodsmen and hunters.

We left San Antonio the evening of the 12th February, and, owing to the very severe weather, a wet norther having rendered the roads very heavy, and the fact that our mules, both pack and saddle, were many of
them wild, and gave great trouble and delay, only reached Fredericksburg on the 19th.

This town is the last settlement on our route, and distant from San Antonio about seventy-five miles, in a direction a little west of north. The road between these places is through a limestone country, generally well watered, and at convenient distances, but often hilly and stony. Two days were necessarily consumed here in procuring additional animals and provisions—our hasty outfit being found incomplete, and several of the mules unfit for the journey before them.

We started from Fredericksburg on the evening of the 21st of February, and the general direction of the courses of the march having been intrusted by me to Richard Howard, esq., the volunteer guide of the party, we made the best of our way towards the head of the river San Saba. To his extensive and accurate knowledge of the country traversed, we were indebted for a march through pleasant and well-watered valleys, admirably adapted for the purposes of a road, and presenting but little labor to the pioneer.

The general formation of this part of the country is secondary. We met with but few evidences of the primary stratifications, and those chiefly on the Llano and on the right bank of the San Saba. I should not judge, from the necessarily hasty and imperfect examination afforded by the march through, that the region is at all rich in mineral products; although we met with evidences that the enterprising Spanish adventurers, in their search for silver, had traversed the country many years before us. The interesting ruins of the San Saba fort, their position and extent, and the vague traditions among both Indians and white men of its establishment, and the existence in its vicinity of rich silver mines, seem to contradict this idea; but, though search has often been made for the locality in question, I have heard of no success, nor can I, in anything to which I have access, obtain authentic information as to the object, commencement, and final destruction of this fortress.

Leaving the head of the San Saba river in the morning of the 2d of March, we camped at night upon a little water found in a hole about fifteen miles west, and barely sufficient for the purposes of our small party. It was the last we were to see until one o’clock on the night of the 5th. We emerged on the morning of the 3d upon the elevated table plain, a vast limestone formation, extending many hundred miles, arid and barren, and thinly clad with scattering mezquite, affording a home for the prairie dog and antelope alone.

The singular accuracy of Mr. Howard’s judgment was here evident, and in a track he had never traversed. Leading the trail, he brought us, with the instinct of a bee, to the precise spot where the party under Hays and Highsmith had separated on their return to San Antonio. Here, we had been told we could have water, and from this point it would be abundant until we reached the Pecos. We passed many places where water once had been, but for three days, starting at daylight, and the last day marching until twelve at night, our panting animals, alike with their riders, were unrefreshed by a single drop: A slight mist, which moistened the grass on the night of the 3d, together with the fortunate occurrence of cool and cloudy weather, I believe alone enabled the party to get through.

Here we struck a creek of the Pecos river, and saw the strange manner
in which the rivers and creeks break through the vast limestone strata that many feet above their beds form the great table land. The descent from the latter is generally difficult, often impracticable—perpendicular limestone bluffs, bounding the level plain and rising like steps from the river, and cut by deep ravines, which show the whole elevation in the form of truncated cones, are the general obstacles. Occasional passes are found, however, and on one of these we were fortunate to hit.

This remarkable river, of which so little is known, rises in the mountains near Santa Fe, and, entering the limestone formation in about the latitude of 31° north, its valley gradually contracts until at length it is found near its mouth winding amid perpendicular cliffs; for hundreds of miles it rolls a red and turbid stream, by a channel of only forty feet in width, and rarely varying, with great rapidity and intricate windings, to the eastern point of the large bend of the Rio Grande.

The fords are not numerous or easy.

I found it necessary to construct a small foot-bridge of live-oak logs for the passage of our packs. The water at first is not pleasant, but the taste soon becomes accustomed to it. This is probably owing to the vast salt and mineral plains through which it runs further to the northward.

Our route lay up the bank for some forty miles. As it advanced, nothing could exceed the appearance of desolation and barrenness gradually assumed by the neighboring country. Bare and bleak hills of the same monotonous table formation, and the almost entire want of timber or even foliage, make the landscape a desert. The only wood to be had here for travelling purposes is the stunted mezquite, which here and there furnishes sufficient for cooking. Much travel would soon exhaust that.

The weary march without water had rendered it necessary to recruit the mules by short marches and long rests; and it was not until the 12th that we left the river by a west course. Twenty-five miles of prairie, occasionally intersected by dry gullies and clothed with a growth of chaparral, brought us to a spring, the first of a remarkable range. They appear to extend along the base of the Charrate Sierra. Strongly mineral in their character, large quantities of various kinds of salts are found encrusted on the grass near them. They are pleasant to the taste. Destitute of any mark by which it may be known there is water at hand, the traveller, before he is aware of it, finds himself immediately upon a clear and refreshing spring. There are five of these as yet found by us, though many more may exist; generally from ten to twenty miles apart, and about fifteen from the base of the mountains. Small creeks generally flow from them for a short distance, and then sink into the prairie. Want of proper facilities prevented an analysis of the salts which appeared on the grass hard by. Two of these springs are designated on the maps of Wisslizenus, the intelligent and learned gentleman who accompanied the expedition under Doniphan, as the Ojo Leon and Ojo Escondido; but, put down probably from report, or the maps of the Mexicans, their position and course are not correct.

Our direction was now assumed generally west, in order to leave the mountains known as the Charrate and Diabolo on our left, and, avoiding the rough country in this manner, afterwards strike in a southerly course for Presidio. We were unacquainted with the nature of the great region to our right. The blue peaks of these mountains were plainly visible, and we bore for them.
As we approached, the whole aspect of the country changed. The aqueous formation gave place to the more rugged work of fire: instead of the flat limestone tables, we found hills of difficult access, crowned with dark masses of amygdaloidal basalt. The columnar structure and great height of the cliffs gave an imposing aspect to the scenery.

Finding that as we advanced the range still continued stretching far away to the northward, it was decided to attempt the passage of the mountains and to shape our march directly for Presidio. On the 17th we entered the valleys at the base of the Sierra Diabolo, little aware of the dangers in our path. Following an old and faintly-marked trail, which led as close to the main peaks, we had traversed, as we imagined, the whole range, and the country gradually began to appear more open; but, soon after entering a valley where the hills prevented an extended view, the party, on the afternoon of the 17th, were suddenly and completely surrounded by five bands of the Apache warriors, each under its respective chief, and numbering altogether some two hundred mounted men.

Viewing us as intruders, they advanced with great rapidity, with hostile gestures, bows strung, and brandished lances. Completely enveloped, where but little resistance could be made to numbers so greatly superior, without even a shrub to which to tie our frightened animals, and numbering only twelve armed men, the situation of the little band was perilous. Judging that here policy was the true course, while Lieutenant Smith and Mr. Howard coolly extricated the command from their dangerous neighbors; and without hurry or confusion reached the side of a small hill, I remained among the Indians, and gained a little time by holding up my hand for them to stop, and calling on their chiefs for a parley. This was agreed to. Why, I know not; for never were men more completely in the power of this treacherous race than ourselves. They sternly demanded who we were, and for what we were in the Apache country. One of them, named Gomez, and, as we afterwards learned, the terror of Chihuahua, was particularly anxious to attack at once. They answered that we were Americans, en route to Presidio; our intentions depended on their own. We had come there peaceful; that we remained so, belonged to them. They insisted that we should instantly come with them and have a talk, but were told there could be no conference until their men were drawn off and they came up unarmed. This appeared to excite dissension among them. Some were for instant attack, while others were undecided. Mr. Howard came down and joined me. The chief Gomez called out that we were afraid, and that if we did not move as they said, their fight would commence; but there was that in the eye and reply of our intrepid young guide and interpreter that caused him to lower his tone. It was satisfactory to see at this moment the cool and resolute demeanor of the escort, who, under the direction of Lieutenant Smith, had now tied the heads of their animals together, and were waiting for the raising of a hand to commence the unequal struggle. On the right and left two parties had stripped and dismounted, with their bows and arrows, in readiness to take us as nearly as possible in flank, while another in front, and mounted, appeared about to charge. But the influence of Gomez was not sufficient to bring the majority of the chiefs to his advice, and they agreed to draw off their people and parley. This was done; and it was decided that they should proceed in advance to the water hard by, where they were encamped, and that we should follow, select our
camp, and in the evening decide our future relations by council. We took post in a small ravine, which afforded some little chance for defence. The Indians, who had here a very large cavalcade of horses and a drove of cattle, were all around us. Our situation was gloomy, and few considered we had a chance to escape. The chief Gomez was particularly urgent that we should scatter about and look for wood, here quite scarce, and go to cooking, repeatedly saying he was friendly; but, observing that his party were all mounted, and their bows still strung, we remained together, each man by his saddle, his arms in his hand, and watching with great anxiety the movements of the Indians.

At eight in the evening, the chiefs, unarmed and with their blankets, appeared to talk. Through the medium of Mr. Howard, I explained that we were an advanced party of the army soon to appear upon this line; that towards all friendly Indians the intentions of the United States were friendly; agents would probably be sent among them, and while they continued peaceable they would be put upon the same footing with the other Indian tribes; that the commanding general was desirous that their chiefs should meet him on his approach and enter into a treaty. Making them some trifling presents of tobacco &c., which they begged as an earnest of amity, they all seemed satisfied but Gomez, who to the last retained his fierce and insulting demeanor.

They were anxious as to our relations with Mexico, and were told that we had been at war with that power, but were now at peace, and that the army would advance to maintain that peace. The slightest allusion, however, to that part of the treaty which relates to restraining Indian depredations upon Mexico and restoring Mexican captives would have been the signal for a desperate struggle, from which fifteen men, with but two days' scant allowance of provisions, without wood and water, and totally unsheltered, badly armed, and worse equipped, had but little chance to escape with life.

We lay down that night upon our arms. The extreme coldness of the mountain atmosphere increased our discomfort. Expecting to be attacked each moment, but little sleeping was done. In the morning we learned from a Mexican captive that a war-talk had been held, and Gomez was only prevented during the night from falling on us by the refusal of the chiefs Cigarrito and Chinonero to aid him.

Saddling up on the morning of the 18th, and leaving this locality, designated in our after conversations as "Gomez camp," we retraced our march of yesterday, guided by the friendly chief Cigarrito. Gomez himself took leave in a very insulting manner, and warned us never to visit that country again. We learned that he was then but four days from Mexico, with a large cavalcade, a great many cattle, and the plunder of his recent excursions into Chihuahua. The old chief who, riding at the head of our train, related these things, added that we must beware of him, for his designs were yet hostile, and begged to be excused from all share in his operations. We stopped at Cigarrito's camp, taking a position above it from which we could defy alike open attack and treachery. The Indians, whether friendly or hostile, are the most accomplished thieves I ever met with, and not one who was permitted to come near our fires, in spite of watching, but went off laden with small articles. The most serious loss to myself I did not discover until some days afterwards, when I found that my saddle-bags had been picked of
various things, including a bundle of papers, comprising all my orders, instructions, letters, private journal, and money vouchers for disbursements at Fredericksburg. It was done while the council was being held and it was dark. Thus the desire of one day retaliating upon Gomez and his party was not lessened by the reflection that he was then probably using my most important papers to cover cigarsitos.

The warning of the old chief of the southern Apaches was not needless. Inducing, by the gift of a couple of blankets, one of his men to put us on a trail which might cross the range of mountains, we left the Apache village. Our route was still somewhat back upon our course, for we found we had come a great deal west, and were told that a difficult and tedious path would have to be followed south if we persisted. The Indian pointed the course and left us. We entered fairly into the gorge of a beautiful pass; and through it, winding its way between lofty and perpendicular walls of basalt, runs a clear brook. The travel was fine, a continued succession of cottonwood groves, mixed with cedar, oak, and hackberry, while the multitudes of wild roses, the only ones we had met with in Texas, made a new feature in the picture. We were pleased to find that little or no labor would be required to pass the road through the mountains here; and this, for we had almost despaired of a practicable route, gave new courage.

A small band of Indians in advance of us, and whom we met in the pass towards night, took to flight.

The creek I named the Limpia, and at one o'clock the next day, 20th March, we passed the mountains and reached the point where we were to leave its refreshing waters. The cottonwood trees here, growing to great size, were marked with the rude painting of the Comanches.

Alarm smokes and signal smokes had now begun to appear in every direction, and the signs around us warned us to be guarded. Although only one o'clock, all our preparations to camp were made; the animals staked out, packs and saddles properly placed. The men carefully examined their arms.

At eight o'clock at night, saddling up, we silently took up our sombre march; leaving our camp fires burning, quitting the trails, as another measure of precaution, and holding our course by the stars, the men were directed to march four and five abreast, the pack mules to be led, and the Mexicans to be ready to fasten all the animals together at a moment's warning. We were traversing a bare dogstown prairie. It was there that Gomez expected to have us at advantage. Two hours had scarcely passed when the sudden flashing of signal fires showed our departure was discovered. Expecting every instant the yell of the enemy, almost helpless in our exposed position, the wind blowing a gale in chill and furious gusts, the darkness of the night, with the mountain peaks behind us lit up with the glare of the fires, combined to render that march one which few of us will forget.

Reaching, at one at night, a huge pile of boulders of grit, weary and desperate, we stopped. The next day we reached the ruins of the Cibolo, where we might regard ourselves in position to bid defiance to Gomez.

It may not be irrelevant here to notice that, on our return march from El Paso, we came by the "Painted Camp" on the Limpia. The grass, where we left it so green and luxuriant, had been trampled by hundreds
of horses, and round our camp fires two hundred Apache lodges had been placed the morning only after we had left. Their trails had come in from every direction upon the raising of the signal fires. We learned that Gomez had intended to take us that night, but lost our track.

On the 24th, after a fatiguing march from the mountains, subsisting on a spoonful of pinoli apiece per diem, and for the last three days our allowance of meat reduced to a slice of panther which the Delaware had killed, we reached Fort Leaton. This is the ranch of an American who has placed himself opposite Presidio del Norte.

We had thus, in thirty-two days from Fredericksburg, reached the "Norte." From this point to the Pecos we had found a fine road. The want of water between that river and the San Saba appeared an insurmountable obstacle; but we hoped in returning to find a better route.

The enterprising owner of the vicinity, Mr. Leaton, exerted himself to the utmost, with but small resources, to furnish provisions and animals for our further progress to El Paso, and to advance the expedition in every possible way.

I take great pleasure in noticing Mr. Leaton here. His position is in every respect remarkable. Located in a valley of the Rio Grande, a little below Presidio, with some eight or ten Americans in his employment, he has in a few months accomplished a great amount of severe labor, fortified himself in a good position, secured his stock, and carried to considerable extent his farming operations, his men being all the while obliged to work with their arms at hand. They have been exposed to the incursions of the Indians on one side, and to a series of outrageous imprisonments and aggressions on the part of the Mexicans on the other, and forced to mount guard day and night. I deemed it my duty to make to General Worth a report upon the conduct of the Mexican authorities at this place.

Mr. Leaton informed me that the Indian tribes were all hostile, and apprehended that it would be impossible to avoid fighting on the march to El Paso. I accordingly increased the party by the addition of two men—all I could find to go with me. Leaving all the baggage which could be spared, and an account of our journey thus far, we set out from Fort Leaton on the 30th of March, to try and find a route by the river to El Paso. I was pleased to find that my men were in nowise daunted by the prophecy that we would not return, and the accounts of the dangers of the route. They appeared, as always, indifferent and resolute. The importance of a river road between these points had been strongly urged by General Worth.

Fourteen days' march, toilsome and severe, through the splendid scenery of the Rio Grande, sometimes climbing precipitous paths high above the river, sometimes winding along its bank, brought the party to El Paso. During that time we rarely let go our arms, and every precaution of close order of march, scouts in advance and rear, and sentinels whenever we stopped, was adopted and kept up. Fortunately for us, the population of the Rio Grande had left the many Indian towns which successively astonished us, and had retired to spend the spring and summer in the mountains—another of the many instances of providential escape which marked our course.

The first fifty miles lay through a well-wooded valley of the river, presenting little or no obstacle to the passage of the troops. A small
fatigue party should always be in advance to clear the chaparral and slope
the gullies. The soil is firm gravelly sand, apparently on the river
banks quite fertile. The next thirty miles, however, is in the formation
called by the Mexicans "caxones," or boxes. Here the red hills are
washed by the river, which they overhang in bold precipitous bluffs ex­
ceedingly difficult to travel, and much labor will be required to pass a
road. Steep narrow ridges of gravel intersect the valley, where valley
exists, and at other points high hills, having a base generally of sandstone
of different varieties, must be turned or climbed by a winding course
upon their sides.

From this, with the exception of two passes of a few miles in extent,
where the road will cross the hills of the Notch and the Eagle Pass of
Mount Chase, the travelling is fair. Beyond, for a hundred miles, the
valley of the river gradually widens into fine bottom land, heavily timbered
with the cottonwood, light sandy soil, when irrigated judiciously, afford­
ing good crops, and fine sites for settlements or posts. This valley finds
its northern limit in the mountains which enclose El Paso, and contains
the Island, a large tract of fertile land, well settled and cultivated, and
now, from the deepest channel of the river being to the west, belonging
to the United States.

The difficulties in the way of communication by the Rio Grande bank
between Presidio and El Paso are not sufficient to do away with its im­
portance to the public interest. Bound to afford protection to our own
settlements which in course of time advance into this region, and by the
stipulations of solemn treaty to restrain and punish Indian depredations
upon Mexico, I regard the construction of a military road upon the river
here as absolutely necessary to this end. Independent of the fact that
communication between posts is itself one great and most efficient barrier
to savage incursions, early secured, it induces settlements, which, in time,
peopled by our hardy pioneers, become the best defence of a frontier.

The range of the numerous Apache tribes is directly upon this river.
Their winter towns are extensive upon its banks; their spring and summer
retreats are found in the mountains, which, with little interruption, extend
from Presidio to Santa Fe. Sheltered by the rugged hills of the Rio Grande
from the winter storms, their families remain in the cottonwood groves,
where their towns are built, while the warriors carry terror and desolation
throughout Chihuahua. From the capital to the extreme frontier no
hamlet exists where the ruthless hand of the Apache has not been felt.
Eye-witnesses alone can have an accurate idea of the terrible extent of
these maraudings. On the Mexican side, and in sight of our path, three
large presidios, with the remains of cultivation about them, now inhabited
by the crow and the wolf alone, stand melancholy monuments of Mexi­
can weakness and Indian ferocity.

Should the route pass to the east of this range, as a military barrier it will
be worthless. It should come where the Indians cross with their plunder,
and whence, by their known trails, the recesses of the mountains may be
reached. The establishment of moving camps, of active mounted men,
always on the alert, always ready, it is thought would tend to the speedy
establishment of a much more peaceable state of things, and at the same
time be attended with but little more expense than fixed garrisons. The
post of depot and refuge should be garrisoned by infantry, but it will be
found that the only efficient force for our great national purposes on this important frontier is cavalry.

On the night of the 12th April we reached Ponce’s ranch, opposite El Paso, the terminus of our outward bound march. The town of El Paso, until the march of Doniphan’s column but little known in our country, and that only to the few traders who from time to time passed through it, is situated about eight miles below the Pass, with a population of five thousand. At the head of a fertile tract of the Rio Grande bottom, and shut into the river by the gravel hills to the west, it rejoices in a pleasant climate and productive soil. The low adobes, or mud-walled houses, are relieved to the eye by luxuriant orchards, pretty gardens, and well pruned vineyards. The green and fresh wheat crops growing around, the peach, and pear, and apricot, and quince, in endless profusion, and the fine appearance of the vegetables, give promise of what American industry and cultivation might do where the Mexican is so productive. They raise with their rude instruments only what they require themselves, of wines, liquors, and grains. In skilful hands the grape here grown will produce delightful wine.

But the greatest abundance and best cultivation is found on La Isla, the fertile island of the Rio Grande, below El Paso, about thirty miles in length, from four to eight broad, and studded with the little towns of Isleta, Socoro, and San Eleziano. This island now belongs to the United States, a change greatly rejoiced in by its denizens, but extremely disliked by the Mexican government.

A scarcity at present prevails in the El Paso valley. This is owing to the fact of their rarely raising more than sufficient for their own wants and the heavy drains upon the farmers by the march of the columns during the war and after the peace. Of stock, the Indians have taken care; and scarcely anything remains of the once numerous herds belonging to the town.

The little hamlet of Isleta, however, originally a village of the Pueblo Indians, as they are called, holds its own well; the slender remnant of some old Aztec tribe, the tradition still alive among them that one day their great Montezuma will return to lift their yoke and redress their wrongs, cultivating patiently their little farms, and retaining to the last their animosity to the Mexican. These, of greater heart than their masters, meet the Apache with his own weapons, and keep themselves inviolate. Still holding to their own dialects and to many old customs, and but half christianised, their worship a rude mixture of Catholic and Pagan rites, their numbers are fast dwindling away, and but few years will pass before the last altar fire of their race will be extinguished.

At an interval of leisure at El Paso, I examined the position of Frontera, situated directly at the pass, with a view to the location of a post for the troops. It appeared to me adapted for the purpose. From it the Santa Fé road, the ford, the Chihuahua and El Paso branches are all commanded, and the control of communications in all directions given to our forces.

Having at length, with much difficulty, succeeded in obtaining a supply of fresh animals and sufficient subsistence, on the 19th of April we joyfully set out on our return march. Several different routes to the Pecos had been proposed to me, but they all struck too much to the north; and, fearful of again encountering the thirsty desert of the great Llano...
Estacado, I determined, by the advice of the able engineer, Mr. Howard, to take the course for San Antonio, convinced that a route could be had. The strength of the party I had nearly doubled, with a view to a different meeting with our friend Gomez, should we fall in with him.

I had secured the services of the brave Captain Skillman, the same gallant adventurer who, with twenty-one men, dashed into the square of El Paso and took General Arinijio in his own town. He had volunteered on the hazardous duty of going to Presidio, and there obtaining the baggage and papers I had left, with such animals as were fit to return. He was to cross the mountains and attempt to join me on the Pecos. I could spare him but three men, and he left on his perilous adventure two days before us.

Our route now lay for one hundred miles down the Rio Grande; and, following in the trail by which Gomez had gone out with his late plunder, we were led through a fine pass of the Rio Grande hills, cut by the action of water through an extensive formation of argillaceous and calcareous sandstone. A deserted camp of numberless lodges covered the valley in which the pass emerged, showing that here, too, the Apache had his home.

Crossing an extensive prairie, or broad valley, lying between the Rio Grande mountains and the Sierra Diabolo, we entered the northwestern hills of that extensive range at a point about twenty miles to the west and north of where we were met by Gomez and his band.

Here features of country entirely new presented themselves. The mountains of granite and porphyry, further to the south of basaltic rock, are the most striking we have yet seen. Following an old Indian path, it led us to a deep ravine, in which trickled a clear and cold mountain spring; from this it climbed, by a steep and perilous ascent of fifteen hundred feet, what we at first thought was a high hill in our course. It proved to be an elevated table valley, from which, surrounded by groves of oak of every kind and large pines, the loftier peaks rear their heads. The ascent was very severe, but amply repaid by the magnificence of the scene. Stopping to breathe, we could see stretching far to the northward the yellow prairie, with the blue mountains of the Rio Grande in the distance, while beneath, at a fearful depth, lay the ravine, relieved in its rugged grandeur by the dark hues of clusters of Spanish oaks and the occasional glitter of the rivulet in its bottom. Our march, refreshed by frequent springs, continued over pleasant slopes and through superb scenery. The aspect of the whole of this elevated table, the pinies and large oaks, altogether so different from any country yet explored by us, almost forced us to the belief that we were too far to the north for our course. We attempted to extricate ourselves from the mountains, now becoming rugged and difficult, by following the course of a creek, but, after hours of slow and toilsome progress between huge walls and over large masses of granite and basalt, we were forced to retrace our steps. Despairing of the road, we were suddenly relieved by the discovery of a pass when most wished for, and shortly had the satisfaction of resting on the headwaters of the Limpia.

Marching by the Wild Rose Pass, the scene of our gloomy night escape, we continued with little trouble and by rapid stages to the Pecos, taking in our route, and at convenient distance, the springs of the "Basin," the Awache, and the Escondido. Continuing down this river by its right
bank, twenty miles below where we crossed before, we were making preparations to ford, when we were relieved by the sudden appearance of Skillman and his men. We had been very anxious about them. Indian signs upon our march had been fresh and frequent. He, too, had met with Gomez, but we now learned that that wily chief, finding that we had escaped him and reached El-Paso, had in the mean time moved nearer to Presidio, and, fearing lest we might come back with a stronger party, had made a treaty with Mr. Leaton, and permitted Skillman to pass unmolested through his whole tribe.

A march of two days, a distance of about thirty-five miles from the Pecos, brought us to the head springs of the San Pedro, a clear river, which, after a tortuous course of some fifty or sixty miles, finds its way to the Rio Grande. This stream, laid down on the maps as the old boundary between the States of Coahuila and Chihuahua, is but little known. Disturnell’s map—an exceedingly incorrect representation, by the way, of the geography of this whole region—puts down upon it an old Spanish fortress called Fort del Altar. We found no traces of it in a march from its head to its mouth. The neighboring country is remarkable. The great limestone table elevation so unbroken, further to the north, is here cut up by innumerable ravines, or canons, of great depth, and frequently showing the whole side, but one perpendicular wall. The road here in several places would require preparation, but a tolerable route is easily obtained by keeping the “Divide” for one-half of the way, and the canons of the Pecos for the other. We crossed the San Pedro at the “Painted Pass,” an old ford of the Comanches. I gave it its name from the Indian signs in it—descending from the Divide by a picturesque cañon which showed in its high walls numerous limestone caves. In one of the largest we stopped to noon. Here, upon the walls, the Comanches had painted their rude sketches of successful forays into Mexico. It seemed that wherever the Indian had his choicest retreats and his most favorable routes, we were bound to go.

Here, again, we fell short of provisions, but, more fortunate than before in the nature of our game, the spoils of five bears, and the successful prowess of our hunter with the venison and the bees, kept us abundantly supplied until we reached the settlements.

Crossing the San Pedro, we emerged in the fine Las Moras valley, an extensive succession of rolling plains, watered by numerous streams, timbered with the live-oak and pecan, and the mezquite, and presenting the finest stock range and the richest soil I had seen in Texas. The traveling was now excellent, and this unbroken country extended to San Antonio, towards which from the “Painted Pass” our course had been nearly east.

After an absence of one hundred and four days, long since given up as lost by all but a few of the most sanguine, we made our appearance in Bexar on the 24th of May, our long and tedious march having by its delay saved an encounter with the cholera, which I consider as another instance of fortunate escape.

A brief summary of the discovered route will not be out of place in this letter. It is extracted mainly from the report rendered in accordance with orders, immediately upon our arrival, to headquarters of the eighth and ninth departments.

Leaving a point on the gulf near Lavaca, it passes through San Anto-
nino, and thence westward, by the well-known Wolf road, as far as Leona Mound. Continuing a general westerly course, it crosses the Nueces some twelve miles from the Leona, and, ascending from the bed of that river to the plateau beyond, passes the country already described to the "Painted Pass" of the San Pedro. Between these two points it crosses, at convenient distances, the running water of the Piasano, the Elm, the Las Moras, the Zoquete, the Pedro, and the San Felipe; thus, in a distance of one hundred and twenty miles, crossing six quite large creeks, with their numerous tributaries. The grazing so far is very good; beyond is not so fair.

Between the San Pedro and the Pecos the labors of the pioneers commence. The road, crossing the former at the "Painted Pass," ascends on to the level Divide by the Cañon of the Caves; this cañon is abundantly supplied with water a few miles further; and on this level table is found the Arroyo de los Palos Blancos, a singular creek, the water of which appears to be slightly sulphuretted; it is, however, drinkable. Two days' march from the Painted Pass reaches the head of running water in the San Pedro, and another finds the so-called head spring, a clear lagoon of living water, surrounded by a heavy growth of pecan.

From this to the river Pecos, a distance of about thirty-five miles, permanent water will not be found; in all wet seasons, however, it is abundant.

The road follows the valley of the Pecos in a northwesterly course for about fifty miles, and then leaving it in a general west direction, and taking in its course the notable springs of the prairie, may pass the Sierra Diabolo by the Wild Rose Pass, or further to the northward by the Gomez Pass, and then strike the Rio Grande about one hundred miles below El Paso. The course of this river is very incorrectly laid down on the maps; the point at which the road strikes it is nearly in the course between El Paso and San Antonio, the general direction of the stream being here east of southeast. Thence it follows the river to El Paso, leaving it twice by suitable passes to avoid the precipitous hills which overhang the waters.

The object of the reconnaissance, as stated in the order of General Worth, to "ascertain if there be a practicable and convenient route for military and commercial purposes between El Paso and the Gulf of Mexico, passing by or near San Antonio or Austin, in Texas," has thus been attained. The great difficulty apprehended was the want of permanent water. It will be seen that no water has been mentioned which is not characterized as living water, and great care was taken to locate the route in such a manner that in all wet seasons water may be found in great abundance. It is believed that no other route yet known to the west presents in this respect the same facilities.

We had thus accomplished our task, with how much good fortune I need not say. Poorly mounted, few in numbers, and hastily equipped, our means of reconnaissance, on our right hand and on our left, were entirely wanting; and, glad to return at all, we have been more than satisfied that a route of any description has been found. In so extensive a country, and so little known, it cannot be said that neither other nor better routes do not exist. Much remains to be known. The geography and geology of the whole region is yet to be settled. But so much is accomplished. It is demonstrated that, untroubled by the storms of winter, a route from the Gulf of Mexico to the great West is opened for the south-
ern States. And it is not improbable that, at no distant day, the continent of Asia and the great Chinese Empire will by this region become to the United States no longer an Eastern, but another Western world.

In concluding this letter, I would say to the Chief Engineer that it is intended merely as a general summary from my journal, and I regret exceedingly that the want of means, and especially of force, has precluded my adding in any manner to the statistical and geological information of the country. I have no apology to make for it but the circumstances of the expedition—not scientific, for we had no time to supply either books, instruments, or maps; not military, for the organization of the party was directly the reverse.

The details of courses, events, &c., will be found in the journal. Possessing none of that interest which scientific explorations have for the thinking and well-informed, and still less the attractive character which similar adventures would enjoy in the hands of a skilful narrator, it is but a meagre outline of labors which at least were zealous.

Accompanying is a rough sketch of the march, made by the compass, and of course only an approximation to the geography of the country. It may serve to convey an idea of the route.

Howard, an accomplished guide, whose judgment, whenever at fault, his decision compensated; and Brady, with his hardy companions, who, resolute and unmurmuring, escorted us for a march of near sixteen hundred miles, I would once more introduce to the Chief Engineer, accompanying the notice with my thanks.

I am, General, your most obedient servant,

W. H. C. WHITING,
Lieutenant of Engineers.
No 13.

REPORT OF THE COLONEL OF TOPOGRAPHICAL ENGINEERS.

BUREAU OF TOPOGRAPHICAL ENGINEERS;
Washington, November 20, 1849.

Sir: I submit, herewith, the annual report of the operations of the corps of topographical engineers, since the report of November, 1848, with an estimate for the ensuing fiscal year.

In consequence of the absence of appropriations for the improvement of rivers and harbors, the duties under this head have been limited to the expenditure of small balances, and more particularly to the balance of an appropriation for repairs and preservation. In order, however, to present a methodical view of the operations of the corps, its several duties will be reported in more detail under the two general heads of surveys and constructions.

FIRST, OF SURVEYS.

Survey of the lakes.—In the report of last November, it was stated that the party of officers on this duty were engaged upon that part of Lake Erie involving the intricate navigation at its western end, between a line from Sandusky to Point Pele, and from thence west to the mouth of Detroit river. Since then, this survey has been completed, and the returns made to the bureau, embracing sixteen sheets of drawings. There has also been received from the same source a chart of the whole of Lake Erie. After completing this duty, the party was directed to repair to the Straits of Mackinac for the purpose of making an accurate survey of those straits and of their vicinities, upon which it is now engaged.

Specific surveys have also been made of the following harbors on Lake Michigan, in reference to their improvement:

1. Of the connexion between Lake Michigan and Black lake at the town of Superior.
2. Of the connexion between Lake Michigan and Maskegon lake about fifteen miles north of Grand river.
3. Of the entrance of Grand river into Lake Michigan.

The field duties of these several surveys have been completed, and the drawings and reports in reference to the same are expected to be received during the course of the present winter.

In addition to these surveys, efforts have been made during the past season to procure additional and correct information of the commerce of the lakes, and it is now in my power to answer any call of Congress on this subject. Similar efforts would have been made in reference to the commerce of our western rivers, but there was no appropriation out of which the necessary expenses could be taken.

Three officers of the corps are engaged in restoring the maps of the northeastern boundary.
Two officers of the corps have been assigned to the running of the Creek and Cherokee boundary, under a law directing that work to be done. The previous boundary was considered erroneous; was the subject of much discontent; and the more accurate survey of it, and the marking of it by suitable monuments, was made obligatory by the Creek treaty of January 4, 1845. The bureau of Indian affairs applied to this bureau to execute the work; which application having been approved by the War Department, two officers of the corps, with other assistants, were assigned to the duty as before stated. The work is not without difficulty. It resolves itself into the tracing of a parallel of latitude upon the surface of the earth. An extract from the instructions to the officer (Captain Sitgreaves) at the head of the expedition is hereto appended.

An application was made by the Home Department in reference to the survey and marking of the northern boundary of Iowa. This duty also resolves itself into the tracing of a parallel of latitude; but, in consequence of the active occupation of the corps, it was not in the power of the bureau to undertake the whole of the duty, nor was it considered advantageous to attempt the whole during the present season. Accordingly, and with the approbation of the War Department and of the Home Department, our efforts are at present limited to the determination of the starting point of the boundary, namely—the determination of the point of latitude 43° 30' on the banks of the Mississippi. For this purpose, two officers (Captain Lee and Lieutenant Parke) were assigned to the duty. The duty has been performed. Captain Lee returned on the 14th instant.

Brevet Major Emory, of the corps, with two officers as assistants—namely, Lieutenants Whipple and Hardcastle—have been assigned to the determination of the boundary under the treaty with Mexico. They are now in California, engaged in that service.

One officer (Lieutenant Simpson) was sent with the expedition from Fort Smith to Santa Fé, in order to explore in that direction a route for a road. His report, with a map of the route, have been received, and are ready for any call that Congress may please to make.

Two officers of the corps—namely, Captain Stansbury and Lieutenant Gunnison—were sent last spring with an expedition from Fort Leavenworth to Oregon. The orders to Captain Stansbury were to stop with his party at Fort Hall; from which place he was to repair to Salt lake, in order to make an accurate survey of that and of Utah lake. He was also directed to examine the country between Fort Hall and the northern extremity of Salt lake, in order to determine the practicability of a wagon road in that direction, and to ascertain if there were a good landing place for provisions and supplies at the northern end of Salt lake.

As it was more than probable that he would have to spend the present winter in the vicinity of that lake, and as it was of great importance to have a knowledge of the settlement known to exist on that lake, in reference to supplies of all kinds for emigrants, or for a military post in that neighborhood, he was further directed to make inquiries in reference to the bread and meat stuffs which the settlement could supply; its artisans of all kinds; its mills and workshops; the prices of articles of food, and the rate of wages of mechanics and laborers; the number of inhabitants of the settlement and their general condition; the character, number, and condition of the Indians of the vicinity; the character of the climate, duration of winter, and its intensity. All facts bearing upon the navigation
of these lakes were also to be investigated, and also those in reference to a position for a military post.

These duties being completed, the party was to return to the States, and, if it could conveniently be done, to adopt for its return route a direction south from Salt lake to St. Joseph's spring, on the caravan road from Los Angelos to Santa Fé, and from St. Joseph's spring he was to follow the route leading eastwardly direct to Santa Fé. For a more full understanding of the service expected of this party, a copy of the instructions to Captain Stansbury is hereto appended. The return of this party is not expected before the ensuing season.

One officer, Brevet Captain Pope, is now out with an expedition exploring the means of communication from Fort Snelling to the Red river of the North, and with views of establishing a military post there.

Three officers of the corps are in California as part of the military staff of that command, and to make such surveys there as the department shall require. Their duties have been very much limited to personal examinations of the country, as the difficulties in procuring hands, and excessive wages, have operated as a prohibition to the making of elaborate surveys.

Four officers of the corps are in Texas, actively engaged in surveys for the military command, and surveys under the direction of the department. The reports from this party have not yet been received.

One officer, Captain Graham, has been engaged in the survey of the Potomac in this vicinity, under a resolution of the House of Representatives. His report and map will be ready at an early day during the ensuing session of Congress.

A thorough survey of the impediments to navigation in the Savannah river, near the city of Savannah, has also been made during the present season; upon the report and map of which, the officer who made the survey is now engaged.

Three officers are attached as assistant instructors, in various branches to the Military Academy, and there are two captains of the corps on the duty of the survey of the coast.

Soon after the commencement of the late disturbances in Florida, two officers of the corps were ordered to that command. Lieutenant Meade immediately repaired there; but it was necessary to retain Lieutenant Smith until he could complete the report and chart of the survey near Savannah.

One officer is engaged in compiling from the best authorities, under a resolution of the Senate, a map of the country between the Mississippi and the Pacific, embracing all our territory on that sea. This map is in a great state of forwardness, but is yet detained, in order to take advantage of the new information which is daily received. It was found necessary that he should have an assistant draughtsman; but the bureau having no officer to spare, and no appropriation out of which a draughtsman could be paid, no person could be so assigned. An able draughtsman, however, being unemployed, has agreed to lend his services to the work, trusting to such remuneration as Congress may in its wisdom, and upon a judgment of his services, think proper to allow.

CONSTRUCTIONS.

Under an application from the Treasury Department, one officer, Colonel Turnbull, is assigned to superintend the construction of the custom-house
at New Orleans; upon which duty he is now engaged. His report to this office, of operations in establishing the foundation of that building, is hereto appended.

And under an application from the same department, the bureau has now in hand the construction of a marine hospital at Paducah on the Ohio, at Natchez on the Mississippi, and at Chicago on Lake Michigan. These duties occupy the personal attention of two officers of the corps, namely: of Lieutenant Colonel Long on the Ohio and Mississippi, and of Lieutenant Webster at Chicago.

In addition to the construction of the marine hospitals on the Ohio and Mississippi, Lieutenant Colonel Long has had charge of the property connected with the western river improvements, and he has also been engaged upon a very elaborate survey of the falls at Louisville, in reference to their improvement. His report and map, with plan and estimate of the probable cost, have been received.

Lieutenant Colonel Long has also under his charge, the construction of a marine hospital at Napoleon, on the Mississippi. But for reasons which have been duly reported to the Treasury Department, the construction of this hospital has been delayed until the reasons for the delay can be submitted to the consideration of Congress.

Lieutenant Webster, superintending the construction of the marine hospital at Chicago, has also the superintendence of the construction of the light-house on the pier at Chicago, and the light-house at the mouth of the Calumet.

The light-house at Monroe, on Lake Erie, built by this bureau at the request of the Treasury Department, has been completed and turned over to that department.

In addition, there are several light-houses of which the construction under this bureau is a special direction of law, which will now be briefly noticed.

Light-house at Chicago, near the end of the north pier.—It has been considered advisable in this case to limit attention for the present season to the construction of the pier-head upon which the light-house is to stand, and to expose this part of the work to the effects of the currents and storms of a winter before erecting the light-house building.

Light-house at the mouth of the Calumet river, Lake Michigan.—The directions in this case have been, not to commence the structure until the necessary lot was secured, and all the forms in reference to the cession of jurisdiction were duly consummated.

Light-house on the Waugoshance shoal, straits of Mackinac.—The pier in this case has been nearly completed, the keeper’s house erected and covered in, and the tower erected to the lantern floor, so that no doubt exists of the completion of the work, and of its being brought into use by next fall.

Light-house on the Brandywine shoal, Delaware bay.—The ice piles to protect the structure have been erected, when, from the exposed and boisterous condition of the locality so late in the season, occasioning great expense with but little work, it was considered advisable to suspend operations until the ensuing season, when the light-house will be completed and ready for use.

Light-house on the Minot’s rock, Boston harbor.—This work is so far
In making the estimate for the ensuing fiscal year, I have been governed by the following considerations:

1st. By the avowal of the President, in his inaugural address, of friendliness to harbor and river improvements.

2d. By the obligations of law which require estimates to be submitted to Congress for unfinished works which have been authorized by law.

3d. By a careful consideration of the amounts, which will admit of judicious and economical operations.

4th. By not including new works in the estimates—that is, works not heretofore authorized by law—leaving these, as heretofore, and in conformity with former instructions to the bureau, to be originated by Congress; but holding the bureau in readiness, as heretofore, to meet any call of Congress about these new works, in reference to survey, plan, and estimate.

These considerations oblige the present estimate to be nearly a copy of that submitted in the fall of 1845. From that year to the present these estimates were discontinued by direction of the Executive, although afterwards, and I believe in every year, called for specially by committees of Congress, and in that way, being submitted to the consideration of Congress, became the basis of the bills which have been reported. All the works referred to in this estimate are so fully described in the printed reports from this office of 1844 and 1845, that it is considered unnecessary to swell this report by merely repeating what is there said.

The following papers are added as an appendix to this report:

Appendix A.—Extract from instructions to Captain L. Sitgreaves, relative to surveying and marking the boundary lines of the country occupied by the Creek and Seminole Indians.

Appendix B.—Instructions to Captain H. Stansbury, relative to the survey of the Great Salt lake, and country in its vicinity, &c.

Appendix C.—Report of Colonel William Turnbull, of operations in establishing the foundation of the new custom-house at New Orleans.


Appendix E.—Report of Major H. Bache, on the Delaware breakwater.
Appendix F.—Report of Major T. B. Linnard, on the construction of an iron pile light-house for Carysfort reef, Florida.


Appendix K.—Report of Lieutenant Colonel James Kearney, upon the survey of the northern and northwestern lakes.

Respectfully, sir, your obedient servant,

J. J. ABERT,

Colonel Corps Topographical Engineers.

Hon. G. W. CRAWFORD,

Secretary of War.
Estimate of funds that will be required for the prosecution of certain works under the charge of the Bureau of Topographical Engineers, during the fiscal year ending June 30, 1851.

<table>
<thead>
<tr>
<th>Objects of expenditure</th>
<th>Amount required</th>
<th>Reference to act making last appropriation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Volume</td>
</tr>
<tr>
<td><strong>SURVEYS.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For surveys for the defence of the frontier, inland and Atlantic</td>
<td>$15,000</td>
<td>Pamphlet</td>
</tr>
<tr>
<td>For military and geographical surveys west of the Mississippi</td>
<td>$20,000</td>
<td>10</td>
</tr>
<tr>
<td>For continuing the surveys of the northern and northwestern lakes</td>
<td>$25,000</td>
<td>Pamphlet</td>
</tr>
<tr>
<td>For a survey of the harbor of Mobile, in reference to its improvement</td>
<td>$5,000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>65,000</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RIVERS AND HARBORS.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For continuing the Delaware breakwater</td>
<td>$50,000</td>
<td>9</td>
</tr>
<tr>
<td>For the improvement of Savannah harbor and the removal of the wrecks</td>
<td>$30,000</td>
<td>10</td>
</tr>
<tr>
<td>For the repair of the sea-wall at the harbor of Buffalo, New York</td>
<td>$14,000</td>
<td>10</td>
</tr>
<tr>
<td>For continuing the improvement of the harbor of Cattaraugus creek, New York</td>
<td>$15,000</td>
<td>9</td>
</tr>
<tr>
<td>For the continuation of the works at Dunkirk, New York</td>
<td>$15,000</td>
<td>10</td>
</tr>
<tr>
<td>For the continuation of the works at the harbor of Erie, on Lake Erie</td>
<td>$30,000</td>
<td>10</td>
</tr>
<tr>
<td>For the continuation of the works at Conneaut harbor, in the State of Ohio</td>
<td>$15,000</td>
<td>10</td>
</tr>
<tr>
<td>For continuing the improvement of the harbor at Ashtabula, Ohio</td>
<td>$15,000</td>
<td>10</td>
</tr>
<tr>
<td>For the further improvement of Grand River harbor, (Fairport,) in the State of Ohio</td>
<td>$16,000</td>
<td>10</td>
</tr>
<tr>
<td>For the continuation of the works at the harbor of Cleveland, Ohio</td>
<td>$20,000</td>
<td>10</td>
</tr>
<tr>
<td>For continuing the removal of obstructions at Black river, Ohio</td>
<td>$10,000</td>
<td>9</td>
</tr>
<tr>
<td>For continuing the improvement of the navigation at the mouth of Vermillion river, Ohio</td>
<td>$10,000</td>
<td>9</td>
</tr>
<tr>
<td>For continuing the works at Huron harbor, on Lake Erie</td>
<td>$6,000</td>
<td>10</td>
</tr>
<tr>
<td>For continuing the preservation of the harbor at Sandusky City, Ohio, and improvement of the same</td>
<td>$12,000</td>
<td>10</td>
</tr>
<tr>
<td>For the further improvement of river Raisin harbor, Michigan</td>
<td>$14,000</td>
<td>10</td>
</tr>
<tr>
<td>For a steam-dredge, equipment, and discharging scows, for Lake Erie</td>
<td>$20,000</td>
<td></td>
</tr>
<tr>
<td>For the continuation of the breakwater structure at Plattsburg, on Lake Champlain</td>
<td>$15,000</td>
<td>10</td>
</tr>
</tbody>
</table>
For the continuation of the breakwater structure at Burlington, Lake Champlain, Vermont
For the repairs and working of the steam-dredge on Lake Champlain
For the continuation of the works at Fort Ontario, Lake Ontario, New York
For the continuation of the works at the harbor of Oswego, Lake Ontario, New York
For continuing the improvement at Big Sodus bay, Lake Ontario, New York
For continuing the works at Oak Orchard creek, Lake Ontario, New York
For the further removal of obstructions at the mouth of Genesee river, in the State of New York
For a steam-dredge, equipment, and discharging scows, for Lake Ontario
For the further improvement of the harbor of St. Joseph, Michigan
For continuing the improvement of the harbor at Michigan City, Indiana
For continuing the improvement of the harbor at the town of Southport, Wisconsin
For continuing the works at the harbor of Milwaukee, Wisconsin
For continuing the improvement of the harbor of Chicago, Illinois
For continuing the construction of a harbor, commenced by the citizens of the town of Racine, at the mouth of Root river, Wisconsin
For a steam-dredge, equipment, and discharging scows, for Lake Michigan
For the improvement of the Ohio river below the falls at Louisville, and of the Mississippi and tributaries, and the Missouri and Arkansas rivers
For the improvement of the Ohio river between Pittsburg and the falls at Louisville
For removing the raft of Red river and improvement of the river
For the removal of obstructions to the navigation in the harbor of St. Louis
For continuing the improvement of the navigation of the Hudson river, near Albany, in the State of New York
For connecting the waters of Indian river and Mosquito lagoon at the Haulover, Florida
For the improvement of the harbor at Dubuque, Iowa
For the repair and preservation of harbor works on the Atlantic coast

Total

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1,025,500 | For completing the light-house on Waugoshance, Lake Michigan
For completing the light-house on Minot's rock, Boston harbor
For completing the light-house on Brandywine shoal, Delaware bay
For completing the light-house on Cary's fort reef, coast of Florida

Total

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
</table>
| 63,580 | Light-houses.
For completing the light-house on Waugoshance, Lake Michigan
For completing the light-house on Minot's rock, Boston harbor
For completing the light-house on Brandywine shoal, Delaware bay
For completing the light-house on Cary's fort reef, coast of Florida

Total

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
</tr>
</thead>
</table>
| 63,580 | Light-houses.
For completing the light-house on Waugoshance, Lake Michigan
For completing the light-house on Minot's rock, Boston harbor
For completing the light-house on Brandywine shoal, Delaware bay
For completing the light-house on Cary's fort reef, coast of Florida
RECAPITULATION.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>For surveys</td>
<td>$65,000</td>
</tr>
<tr>
<td>For rivers and harbors</td>
<td>$1,036,500</td>
</tr>
<tr>
<td>For light-houses</td>
<td>$63,800</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,164,300</strong></td>
</tr>
</tbody>
</table>

BUREAU OF TOPOGRAPHICAL ENGINEERS, October 27, 1849.

J. J. ABERT,
Colonel Corps Topographical Engineers.
APPENDIX A.

Extract from instructions to Captain L. Sitgreaves relative to surveying and marking the boundary lines of the country occupied by the Creek and Seminole Indians, dated Bureau of Topographical Engineers, April 16, 1849.

"The line commencing at the mouth of the north fork of the Canadian river seems undisputed until it reaches a well known point on the Verdigris, where the old territorial line crosses the same." Here the disagreement begins. The treaty of 1833 provides that the boundary shall run "thence from where the old territorial line crosses it (the Verdigris,) along said line north to a point twenty-five miles from the Arkansas river, where the old territorial line crosses the same; thence running a line at right angles with the territorial line aforesaid, or west to the Mexico line; thence along the said line (Mexico line) southerly to the Canadian river, or to the boundary of the Choctaw country," &c., &c.

It is averred that the line running from the Arkansas north measures but twenty-four miles, forty-one chains, and nineteen links, and was at a variation of ten degrees west; whereas the true line should be twenty-five miles long, run at a variation not exceeding eight degrees west; but the law does not authorize any disturbing of this line. It will, however, have to be run over, to determine its correct length of twenty-five miles, as its extreme point north constitutes the starting point for the northern boundary. This point being determined, then the due west line from thence to the 100th degree of longitude will have to be run and marked; and thence the line of that meridian has to be run and marked to the Canadian river.

The lines, then, which have to be measured are:

1st. The twenty-five miles from the Arkansas river, (i.e. its northern bank,) where the old territorial line crosses it, along the old trace of that line to a point where the twenty-five miles shall be attained.

This is a simple operation—requiring, however, care and exactness. The old trace should be rigidly pursued, and the line measured, with a well made fifty-foot chain. The terminating point of the twenty-five miles should be carefully marked by the sinking of a suitable iron post, and the ground around it most carefully and minutely surveyed, so that this point may always be recovered, should any accident happen to the post used to mark the point.

2d. The line from this point, so determined, then extends itself to the 100th degree of longitude, and resolves itself into the tracing of a parallel of latitude for that distance. The length of this line will probably be from 260 to 265 miles.

3d. From the point where this western line shall intersect the 100th degree of longitude, a meridian line has to be run southwardly to the Canadian river.

The law requires that the northern and western boundary lines of the Creek country should be plainly and distinctly marked. This injunction of the law applies to the line from the termination of the twenty-five miles

"The line commencing at the mouth of the north fork of the Canadian river seems undisputed until it reaches a well known point on the Verdigris, where the old territorial line crosses the same." Here the disagreement begins. The treaty of 1833 provides that the boundary shall run "thence from where the old territorial line crosses it (the Verdigris,) along said line north to a point twenty-five miles from the Arkansas river, where the old territorial line crosses the same; thence running a line at right angles with the territorial line aforesaid, or west to the Mexico line; thence along the said line (Mexico line) southerly to the Canadian river, or to the boundary of the Choctaw country," &c., &c.

It is averred that the line running from the Arkansas north measures but twenty-four miles, forty-one chains, and nineteen links, and was at a variation of ten degrees west; whereas the true line should be twenty-five miles long, run at a variation not exceeding eight degrees west; but the law does not authorize any disturbing of this line. It will, however, have to be run over, to determine its correct length of twenty-five miles, as its extreme point north constitutes the starting point for the northern boundary. This point being determined, then the due west line from thence to the 100th degree of longitude will have to be run and marked; and thence the line of that meridian has to be run and marked to the Canadian river.

The lines, then, which have to be measured are:

1st. The twenty-five miles from the Arkansas river, (i.e. its northern bank,) where the old territorial line crosses it, along the old trace of that line to a point where the twenty-five miles shall be attained.

This is a simple operation—requiring, however, care and exactness. The old trace should be rigidly pursued, and the line measured, with a well made fifty-foot chain. The terminating point of the twenty-five miles should be carefully marked by the sinking of a suitable iron post, and the ground around it most carefully and minutely surveyed, so that this point may always be recovered, should any accident happen to the post used to mark the point.

2d. The line from this point, so determined, then extends itself to the 100th degree of longitude, and resolves itself into the tracing of a parallel of latitude for that distance. The length of this line will probably be from 260 to 265 miles.

3d. From the point where this western line shall intersect the 100th degree of longitude, a meridian line has to be run southwardly to the Canadian river.

The law requires that the northern and western boundary lines of the Creek country should be plainly and distinctly marked. This injunction of the law applies to the line from the termination of the twenty-five miles
to the 100th degree of longitude, and from thence to the Canadian.
The probable length of this meridian line cannot well be stated. It is sup-
posed that it will not exceed sixty, nor be less than forty miles. Opera-
tions of this kind are approximations to the truth, and the higher the order
of instruments employed, and the higher the order of mathematical con-
siderations and of formula involved, the nearer will be that approximation to
the exact truth. But there is a limit of utility which should not be dis-
regarded, and which should be allowed to control, in preference to pro-
cesses interminable in the time they employ, and totally disproportioned
in their results, in reference to the expenses which they require. Under
these considerations, you are directed to pursue the following process:
1st. Of the parallel of latitude from the north end of the twenty-five
mile line to the 100th degree of longitude.
2d. Of the meridian from the termination of this last line to the Cana-
dian.

1.—Of the parallel of latitude.

The latitude of the point "twenty-five miles" from the Arkansas must
be determined to enable you to compute the elements for running the par-
allel; but, as an error of one minute in the latitude will not change these
elements to a degree practically appreciable for the distance you will proba-
ably use them, you may observe with the sextant, with which, by proper
care, you should obtain the latitude, with an error of less than 10" by se-
lecting proper stars both to the north and south of the zenith, and adopt-
ing the method of circum-meridian altitudes.

The determination of the 100th degree of longitude west from Green-
wich, will be your most difficult problem.

As you cannot foretell the nature of the country as regards supplies,
encampments, &c., where this point will fall, you should not trust to
making the necessary observations (which will require from two to three
weeks) at the point itself, but rather make all the observations near the
point of beginning, and trust to your measurements to determine the end of
the line; for which purpose you are furnished with a transit instrument and
two chronometers. And you will observe, at or near the 25-mile point, or at
any other convenient point further west on the parallel, transits of the
moon, and of the moon culminating stars of the Nautical Almanac, through
at least ten complete sets of observations—i. e. the moon and at least two
stars on each side of it.

These observations you must make with great care. The transit should
be firmly mounted, and, if possible, sheltered from the wind, and the
instrumental errors of collimation, deviation in azimuth, and inclination
of the axis, carefully and very frequently ascertained.

For the detail of the computation, you are referred to the 1st number of
the Topographical Engineer Papers.

It is advisable, however, that you lose no time in these computations;
but, at the end of every three or four nights of good observations, send to
this bureau, by mail, a transcript of your transit book, (including such
stars as you may have observed for the time, and also your latitude, or the
elements for computing it,) in which all instrumental constants and errors
should be carefully noted.
The observations will be computed for you, and the result forwarded to you with the least delay.

The object of this is, that you may proceed tracing the parallel whilst these observations are in progress, and without waiting for the final determination of your longitude, which only enters as an element in determining your point of ending, (the 100th degree.)

Of the different methods of tracing a parallel of latitude, that by means of offsets is best suited to the nature of the country in which you are to operate, and to such instruments as can be readily and safely transported. It consists in determining and prolonging the prime vertical or line perpendicular to the meridian of the point of departure, and in laying off to the northward of this line offsets to the required parallel. This perpendicular to the meridian would, in a sphere, be a great circle; but in the spheroid it becomes a curve of double curvature, composed of elementary arcs, having for their radius normals to the earth's surface, which are continually (as you progress along the line) changing in magnitude and position. This renders the computation of the lengths of these offsets a complicated problem. Practically, however, the approximation to the truth need not be carried beyond the following abbreviations of the more refined formulae:

Let $L$ be the latitude of the point of departure.

$D$, the distance, in feet, measured on the perpendicular to the meridian of the point of departure.

$L$, the latitude at the end of any distance, $D$.

$N$, the normal, or radius of curvature of the perpendicular to the meridian, in English feet.

$e$, the eccentricity of the earth's meridians.

\[ \log e = 8.9122052 \]

\[ D = 2 \tan L \left( 4 \cdot e^2 \cos^2 L \right) \]

\[ \frac{1}{2} = \log \frac{1}{2} \sin^2 L' = \frac{1}{2} \log \frac{1}{2} \sin^2 \left( L - e \cos^2 L \right) \]

Let $L_1$ be the log. of the point of departure.

Then, to determine points in the parallel of $L$, trace a line perpendicular to the meridian of the point of departure, and at the end of any distance, $D$, in this line, lay off the distance ($L - L_1$) in feet, on the meridian of $D$. The extremity of this offset ($D'$) will be a point in the parallel.

To find the angle which the perpendicular to the meridian of the point of departure makes with the meridian of any distance, $D$, (the angle being measured from the north towards the east,)

\[ Z = 90^\circ - \frac{D}{N \sin \frac{L_1}{2}} \tan L_1 \]
To find the difference of longitude between $D'$ and the meridian of the point of departure:

$$\text{Difference of longitude (in seconds)} = \frac{D'}{N \sin \frac{\theta}{2} \cos L} \sin Z, \quad (3)$$

$$\text{Difference of longitude in feet} = D' \sin Z.$$

As an example of the use of these formula, the following are the elements for tracing the parallel of $36^\circ$ N:

<table>
<thead>
<tr>
<th>Distance in miles from the point of beginning</th>
<th>Length of offset $= (L - 1) \cdot$</th>
<th>$d = \text{latitude at the end of any distance}$</th>
<th>$Z = \text{angle, with the true meridian, at any distance}$</th>
<th>Longitude of the point of the parallel determined by each offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
<td>36 00 00 00</td>
<td>09 59 22</td>
<td>0 01 04 3</td>
</tr>
<tr>
<td>5</td>
<td>1.9</td>
<td>35 59 60</td>
<td>09 56 21</td>
<td>05 21 3</td>
</tr>
<tr>
<td>10</td>
<td>4.3</td>
<td>35 59 59</td>
<td>09 53 49</td>
<td>10 42 6</td>
</tr>
<tr>
<td>15</td>
<td>7.7</td>
<td>35 59 59</td>
<td>09 50 13</td>
<td>15 05 0</td>
</tr>
<tr>
<td>20</td>
<td>11.1</td>
<td>35 59 58</td>
<td>09 47 25</td>
<td>21 28 2</td>
</tr>
<tr>
<td>25</td>
<td>14.5</td>
<td>35 59 57</td>
<td>09 44 16</td>
<td>26 46 9</td>
</tr>
<tr>
<td>30</td>
<td>18.0</td>
<td>35 59 56</td>
<td>09 41 07</td>
<td>31 07 8</td>
</tr>
<tr>
<td>40</td>
<td>25.6</td>
<td>35 59 52</td>
<td>09 38 09</td>
<td>42 50 4</td>
</tr>
<tr>
<td>50</td>
<td>33.2</td>
<td>35 59 48</td>
<td>09 28 32</td>
<td>53 33 3</td>
</tr>
<tr>
<td>100</td>
<td>66.4</td>
<td>35 59 44</td>
<td>08 57 08</td>
<td>1 47 05 2</td>
</tr>
<tr>
<td>150</td>
<td>100.8</td>
<td>35 59 43</td>
<td>08 23 00</td>
<td>2 40 35 7</td>
</tr>
<tr>
<td>200</td>
<td>135.2</td>
<td>35 59 40</td>
<td>07 54 10</td>
<td>3 34 04 1</td>
</tr>
<tr>
<td>250</td>
<td>170.0</td>
<td>35 59 36</td>
<td>07 24 05</td>
<td>4 19 08 1</td>
</tr>
<tr>
<td>300</td>
<td>205.6</td>
<td>35 59 32</td>
<td>06 51 57</td>
<td>5 20 50 1</td>
</tr>
</tbody>
</table>

A similar table should be made out for every mile of the line perpendicular to the meridian of the point of departure, as far as about fifty miles beyond which the offset would perhaps be found inconveniently long. A new prime vertical should then be determined at the intersection of the last offset with the required parallel, and the process repeated as before described.

The number of these offsets must depend upon the nature of the ground; they should always be made to the point of the parallel, to be marked by a post; and these posts should never be more than five miles apart, besides such as should be placed at all intersecting of streams of importance, or other notorious points. The measurement of the line will enable you to represent its topography, woods, &c.

You will perceive that the accuracy of the work depends in a very great degree upon the correct determination of the line perpendicular to the meridian, and upon its being correctly prolonged and measured.

Your best plan of determining this line is, to determine your true meridian, and to lay off $90^\circ$ from it with great care, with your theodolite, repeating the measurement of the angle several times.

In prolonging the line, use, whenever you can, your astronomical transit, for determining points along the line as distant as the nature of the ground will permit. The filling up to be made with your theodolite.

Your measurements should be made with a well tested chain, and all precautions should be taken to insure their accuracy.

In the determination of your true meridian, whenever the astronomical transit cannot be conveniently used, observe the elongation of some cir-
cumpolar star with the theodolite, and, whenever it is practicable, both the eastern and western elongations.

2. — Of the meridian from the 100th degree to the Canadian.

The third one of the preceding formulas enables you to compute, from your measurements and the determination of the longitude of the point of beginning, the 100th degree of longitude, and the tracing of the meridian should be made by the methods already pointed out, and with the same care. It is desirable that the length of this line should be known.

As in the course of your operations you will make frequent determinations of the true meridian, it is desirable that you take at all such meridians careful readings of all your compass needles, and note the magnetic variations. The most proper time for this is about the middle of the day, when you will most likely to obtain a mean between the greatest easterly and westerly diurnal variation.

To enable you to confirm to these instructions, you will be furnished with one astronomical transit and two chronometers; one sextant and artificial horizon; two thermometers; one theodolite; one circular framer; one surveyor's compass; two 50 foot chains; one English Nautical Almanac for 1849.

Respectfully, sir, your obedient servant,

J. J. ABERT,
Colonel Corps Topographical Engineers.

APPENDIX B.

BUREAU OF TOPOGRAPHICAL ENGINEERS,
Washington, April 11, 1849.

Sir: You will repair to Fort Leavenworth, Missouri, and report to Colonel Loring, who command the detachment about to move west from that position.

Lieutenant Gunnison has been ordered to St. Louis, to report to you. Should he not be there on your arrival at that place, or before you go from thence to Fort Leavenworth, you will leave orders for him to follow you. And should you consider it desirable to have another assistant, you can apply to Colonel Loring for a second lieutenant, who may probably have it in his power to detach an officer for that purpose.

The detachment under Colonel Loring is to proceed to Oregon, but you and your command will not accompany it farther than Fort Hall.

Although the route to Fort Hall is known, and will be found designated on the map sent herewith, (Fremont's report,) yet it will be proper on your part carefully to observe the route, in order to correct or confirm it, particularly at all notorious positions, such as Fort Kearny, Fort Laramie, the South Pass, and Fort Hall.

You will be allowed to engage not exceeding ten men for the special purposes of your duties. It may be advisable not to engage more than six of these in the first instance, trusting that at Fort Laramie and Fort Hall you may complete your complement with men acquainted with the mountain passes and the Indians of that region.
Such instruments as you want will be supplied from the bureau or by purchases on your requisitions previously submitted to the bureau and approved.

It will be proper for you to have one wagon at your control to carry your instruments and the baggage of your party.

On your arriving at Fort Hall and having organized your party, you will proceed south to the head of the Great Salt lake, its northern end, upon a route which you will find marked in red pencil on the map, which, if the map be correct, will prove to be a practicable wagon route; and you will determine the facility of the lake at this end as a landing place for provisions and other supplies from the Mormon settlements.

A correct survey of this lake will have to be made, not neglecting its soundings, so that its capacity for navigation and the transportation of supplies by water may be known.

You will probably find it convenient in the execution of this duty to make your home at the Mormon settlement. This settlement is said to be chiefly on the southern and eastern sides of the lake.

The connexion of the Salt lake with Utah lake should be carefully surveyed, and also this last lake.

Should you find it necessary to increase the number of your party by temporary employments of the Mormons while in the execution of these duties, it can be done.

While with the Mormons you will inquire into the condition of the settlement and its ability to furnish provisions at the nearest point on the Oregon route, which is probably Fort Hall.

What quantity of corn, wheat, and rye can be counted upon, over and above the quantity required for the settlement.

What quantity of meat—beef and pork.

What artisans are to be found in the settlement, particularly workers in wood and iron. How is iron procured, and its quality.

Are there saw mills at the settlement; what number; and the kinds and quantity of timber which can be obtained.

What number of grist mills, and their capacity.

Prices of all articles of food, mechanics’ wages, and prices of labor.

Number of inhabitants in the settlement.

Character, number, and condition of the Indians of the vicinity.

The character of the climate and its seasons; duration of water and its intensity.

Is the navigation of these lakes dangerous; if so, of what kind are these dangers. If interrupted by ice, for how long. Is coal found in that vicinity.

What kinds of boats are used on the lakes; are there means of building suitable boats at the settlement.

What would be the best position for a military post in that vicinity, in comparison with Fort Hall, and in reference to the land route to Oregon.

Supposing Fort Hall to be the position ultimately adopted on the Oregon route, the facility of supplying it from the Mormon settlement by water and land, or solely by land.

These and other questions, bearing upon a satisfactory knowledge of that region, will receive your attention, keeping in mind that such distant expeditions can be made but seldom, and that the officer in command should
neglect no subject of interest, or which will leave a serious void in his report.

Having completed these duties, you will return to the United States by the best route from the lakes, which will probably lead to St. Vrain's or Bent's fort; or should you find it convenient for the return route to go south from Utah lake to St. Joseph's spring (see map of Frémont's report,) and then by the trail from that vicinity, noted on the map as the “trail from Pueblo de los Angeles to Santa Fé,” it would afford you an entire new theatre of observation, particularly in the route of the “trail,” and would give better knowledge than we now have of what is considered the shortest route from the States to California, by Santa Fé and this “trail.”

As your duties after leaving Fort Hall will be over comparatively new ground, you will perceive the necessity of keeping an exact journal of events, and of making those observations which will enable you to give a correct map of your route.

In order to facilitate your geographical operations, I shall send with this letter a few sheets of instructions on that subject.

You will probably find it convenient to divide the duties of your command, assigning to one officer those specially relating to determinations of latitude and longitude. A good example of the report which will be expected on this subject will be found in the report of Major Emory of his route to California.

When at Fort Laramie, you will take a correct plan of it and examine the immediate vicinity, in reference to its adaptation to agricultural purposes, its ability to furnish pasture, and its facilities for water and fuel, and also if there be water power in its neighborhood adequate to supply a saw-mill, and timber for such a mill.

You will start with the first detachment, and keep with that, as much as practicable, throughout the whole route.

Mr. Campbell, of St. Louis, will be of great aid to you in the outfit of your party, and has funds in his hands which can be applied to such purposes. Your own expenditures will be charged to “surveys with armies in the field.”

Respectfully, sir, your obedient servant,

J. J. ABERT,

Colonel Corps Topographical Engineers.

Captain H. STANSBURY,


APPENDIX C.

NEW CUSTOM-HOUSE,
New Orleans, October 20, 1849.

Sir: Soon after the close of the late campaign in Mexico, the honorable Mr. Walker, Secretary of the Treasury, made me the very high compliment to ask for my services to superintend the construction of the new custom house in New Orleans—and, with your approbation, the Secretary of War, through the general in chief, directed me to return from Mexico for this purpose. I repaired to Washington, and having received the instructions
of the Secretary of the Treasury, returned to New Orleans in the month of September, 1848.

It was with great reluctance and diffidence that I undertook the task of preparing the foundations of so great a building—the very largest, I believe, in the country—in so precarious a formation as that upon which the city of New Orleans stands; but not feeling at liberty to decline so great a distinction, I immediately set about to prepare myself for the task, and have now the honor to submit my report to you of the plans adopted by me.

My first step was to make myself acquainted with the plan usually pursued in this city in making the foundations of the principal or most extensive warehouses and other large structures. I found that the greatest depth to which it was thought necessary or safe to go was, for warehouses, about twenty two inches, or two feet. The foundation was then laid in soft mud and water, on two thicknesses of two-inch plank, varying in width from four feet six inches to five feet, according to the thickness of the walls of the superstructure—which in many instances proved to be very insufficient, and great settlement followed, causing the walls to crack, rendering the building very insecure; and in some cases they have fallen down, and in others have been pulled down to prevent disaster.

The St. Charles Hotel, the largest and heaviest building in this city, was founded but three feet below the surface of the ground, on two courses of two-inch plank crossed. This building has settled at least eighteen inches, and the external walls are cracked between almost every opening on the fronts; and in the interior, the floors are very undulating, showing a very unequal settlement. All these facts perplexed me very much, and at one time I was almost determined to adopt a method used at Bayonne, in France, in 1830, of founding on sand, and recommended as being the only mode employed in Surinam to secure the foundations of buildings erected on the very worst kind of soil; from the account of which, published in the Ponts and Chaussées, and translated in the professional papers of the royal engineers of England, I extract the following: “The first experiment was made in the foundations of the columns of a portico in front of a guard house. In this instance the ground was taken out to the depth of three feet four inches below the footing, or about five feet four inches below the surface of the ground, and to the width of about three feet six inches at the bottom and four feet six inches below the footing. This space was then filled in with sand well beaten with rammers; on the sand two courses of rough masonry in common mortar were laid—the first, about three feet four inches square and twelve inches deep; the second, two feet eight inches square and of the same thickness; upon these the base of the columns was placed. Before completing the work, one of the columns was loaded with about nine tons of lead, when no sensible settlement took place. The work was then completed, and that portion has hitherto shown no symptoms of failure, though one of the walls of the guard house, which was carried up on its old foundation, is constantly settling. Each mass of sand is estimated to be loaded with about ten tons, or about 16 cwt. per superficial foot of foundation; the soil is alluvial, being composed of silt or ooze to a great depth.”

But before making up my mind as to the plan of foundation I should adopt, I determined to investigate the subject still further, and made borings on the ground which the new custom-house was to occupy. I used an auger eight inches in diameter, and bored to the depth of twenty-
seven feet. Passing through the first three or four feet of depth—which was of a light spongy vegetable substance, perfectly saturated with water—we came to a stiff blue clay, with a very slight admixture of very fine sand; this stratum of blue clay continued to the depth of the boring, (twenty-seven feet) which was limited to the power used. To have continued it further I should have been obliged to construct machinery for additional power, but the experiment was considered perfectly satisfactory, and I determined to use a grillage for the foundations. I was confirmed in this determination, too, from the fact that in taking up the foundations of the old custom-house, on the same ground which the new one was to occupy, and which were only three feet below the surface, the plank (cotton wood) which sustained them were found to be perfectly sound, although the building had been standing thirty years. The external walls of the new custom-house are four feet in thickness, and the partition or cross-walls two feet six inches thick, with pilasters four feet square at intervals, to sustain the groined arches. The excavation for the external walls was opened fifteen feet in width, and that for the partition walls ten feet in width, and each to the depth of eight feet, on an average, below the surface. Whilst excavating through the superstratum of light spongy substance, we were obliged to use pumps night and day to keep the ditches free of water for the laborers; but when we had reached the stratum of blue clay, and when the ditches for the external walls on the whole trace of the building, and for two or three of the principal partition walls, were opened, the whole area was perfectly drained and dry, so that it was only necessary to use a pump at the outer angles and at long intervals, to keep the entire work perfectly free of water.

The bottom of the ditches was carefully levelled with an instrument, and three inch plank, fifteen feet in length, were first laid crosswise of the bottom, every tenth plank being bevelled, and the remainder laid with a straight edge. On these planks timbers one foot square were laid lengthwise, close together and breaking joints; again timbers one foot square and fifteen feet in length were laid crosswise, three feet apart from centre to centre, leaving intervals of two feet between these timbers; the whole was then firmly connected together by tree-nails. Upon this grillage and over the centre of it was laid concrete two feet in thickness, firmly rammed into moulds seven feet wide at the base, brought up perpendicular to the top of the timbers, and then sloped one to one on the sides, reducing it to five feet on the surface. The concrete was composed of one part cement, one and a half sand, five and a half parts shells and broken granite. On the concrete was commenced the brick-work, laid in full bedded mortar of half cement and half sand—mixed in a mill—stepping into four feet in thickness at the surface of the ground. On this commenced the granite ashlar, backed with brick of the superstructure; the ashlar of the first story being fourteen inches in thickness, that of the second story will be twelve inches, third story ten inches, and the fourth story eight inches. The brick backing and the ashlar are bonded together by means of iron clamps at every alternate course of stone; these clamps are two and a half inches by half-inch, let in or countersunk on the top of the course, and a dowel of iron, half inch diameter, is inserted at the end, two inches into the stone and through the clamp, and projecting two inches above. The stone of the course above is drilled on the build to fit these dowels, so that each set of clamps secures two courses of stone. The length of the clamp is one brick

[Doc. No. 5. 311]
less than the thickness of the wall, and the opposite is split for one foot in length, and the parts bent at right-angles in opposite directions, so that it embraces at least nine courses of brick and secures them firmly to the ashlar; the other alternate courses are simply dowelled together, two dowels, half inch in diameter, to each stone.

The corner stone of the building was laid with the usual ceremonies on the 22d of February, 1849. Although but one year has elapsed, on the 18th of October, since the excavations were commenced, yet the entire foundation has been completed; the plinth or first course of granite, backed with brick, is set on three of the fronts, and all the partition walls are, on an average, five feet above the surface of the ground. I have established a bench mark, to which I have referred the level of each angle and the centre of each front of the building, by which the settlement can be ascertained.

Having heretofore alluded to the great magnitude of this building, I will here state that the principal front, on Canal street, is 334 feet in length, and the other fronts as follows: New Levee street 310.325 feet, Custom house street 251.920 feet, and Old Levee street front 296.608 feet; forming a trapezoid, and covering an area of 87,333 feet. The length of the external and all the partition walls developed, measures one mile and 349 feet.

I have heretofore sent a copy of the drawing of the foundations to the bureau.

With great respect, your obedient servant,

W. TURNBULL,
Major Top. Engineers; Brevet Colonel.

Colonel J. J. ABERN, Chief Topographical Engineer.

APPENDIX D.

PHILADELPHIA, October 31, 1849.

Sir: I have the honor to submit the following report upon the works intrusted to my superintendence for the year 1849.


In April, 1847, I made a close examination of the present light-house on the Whale’s Back, and in the report to the bureau of the 2d April of that year, I stated the reasons which induced me to recommend that no steps might then be taken towards the rebuilding of the structure. These reasons were:

1st. That the condition of the light-house was such that there was no immediate danger to be apprehended; but, on the contrary, that the building might last for some years to come.

2d. That the principle of supporting a light on iron piles in situations exposed to a heavy sea had been successfully established; and as it was proposed to build the light-house for Minot’s Rock, in Boston harbor, upon that principle, I advised that the rebuilding of the Whale’s Back light should be postponed until the result of the undertaking at the Minot should become known.

This recommendation the bureau adopted; and as the building of the
light at the exposed rock of the Minot's was not brought to a close until late in October, the work at the Whale's Back has not been commenced, or rather not recommended to be commenced.

A careful inspection of the present building should be made in the approaching spring, and it can be better decided then than now, whether a further postponement would be judicious or not.


In the annual report for the year 1848, (November 4,) I described minutely the plan of the structure, the mode of carrying on the work at the rock, the difficulties, the great delays occasioned by the very exposed situation of the site, and other circumstances of interest connected with the undertaking; it does not appear necessary, therefore, to repeat here information which is already in the possession of the bureau, but simply to refer to the report just named.

At the date of the last report, all the piles, the main braces, and the cast-iron cap, or spider frame, were in place; this last operation, the placing the cap—a casting weighing five tons, and fourteen feet in diameter—on the pile-heads fifty-five feet above the rock, was successfully accomplished on the 30th October, 1848.

In this condition the skeleton structure remained through a boisterous and unusually icy winter, and notwithstanding the feet of the piles were but partially wedged and secured in the rock, (continuous storms and gales of wind preventing all attempts to place the wedges for the outer piles,) still, the rough treatment it received during the winter, and the frequent large accumulations of ice upon it, formed by the spray of the almost uninterrupted breakers encompassing the rock, left no vestige behind to be seen in the spring; thus furnishing tolerably good evidence of the stability of the structure.

Early in the spring, 27th April, the contractor was prepared with all necessary means for levelling, wedging, and keying the iron work, but it was not until 12th July that this could be fully accomplished; the shape of the rock seaward is such, that with the slightest motion in the water the sea is rolled up the sides of the rock, ascending, as it were, an inclined plane, and keeping the entire base of the structure submerged almost continually.

After the heavy wedges were inserted at the foot of each pile, the vacant spaces left between the side of the holes in the rock and the piles were filled with iron filings carefully packed in; these in a short time, by the action of the sea water, form a very excellent and lasting cement.

The collars upon the piles to which the braces are secured were then wedged in place, and the cap fastened to the pile-heads by means of keys and bolts of an appropriate kind; between the inside of the collars and the piles melted zinc was poured to fill the vacant space, as well as to prevent any working in the wedges. This zincling was introduced at the Black Rock beacon in 1843, for the same purpose for which it was used at the Minot, and an examination of the work made in June last showed most clearly that the zinc had protected or preserved the iron with which it was in contact. At Black Rock the collars of the five outer piles were zinced, while the collar of the centre pile was merely wedged without zincling. The difference in the appearance of the iron is most striking in favor of the zincling, and clearly shows that the iron has been preserved at the expense of the zinc, the latter exhibiting appearances of corrosion.

While the work above described was in progress, the wood work for the
living room and store-room was also being carried on. The eight uprights at the angles of the sectagon, which forms the living room, are of cast-iron, as described in former reports; these are secured upon the cast-iron cap by means of flanches and screw-bolts. They are furnished with grooves, into which the siding of the house or living room is secured with a water-tight joint; the interior is fitted with three berths and place for cooking-stove, &c. In the cellar or store-room is ample space for provisions, water, oil, fuel, and a hoisting apparatus for a boat is also provided. The whole forming plenty of space for the comfortable accommodation of two persons, the keeper and his assistant; and without two persons this light should never be left, for it very frequently happens that no landing can be effected in winter for a period of two or three weeks; and in such a case, illness or accident might prevent the light from being illuminated if left in the care of one individual.

The lantern is eleven and a half feet in diameter at the angles, and six and half feet in height; the frame is of wrought iron, and the glass forty-four inches by twenty-four, of the best French plate; three-eighths of an inch thick; the reflectors are twenty-one inches in diameter, with very heavy plating of silver; there are fifteen of them, furnished with brass argand lamps.

The lamp frame is so constructed that 210 degrees of the horizon will be illuminated, this being the extent that is needed, as the residue of the circle falls upon the land.

Boston light is a revolving light, and the Minot, being next in order upon the coast, should be fixed; accordingly, its present apparatus is of that description.

The workmen engaged in fitting the wood work, lantern, &c., slept in a shanty erected upon the second tier of braces, for the first time on the 13th of July, and continued to live there until the wood work was principally completed.

The illuminating apparatus was placed in the lantern on the 27th instant, and the structure reported ready for use on the 29th instant.

Although all that has been expected by me at the Minot has been accomplished, and the structure, as it stands, I consider entirely safe, and will, without doubt, answer all the purposes for which it was built, still I have considered it important, in order to guard against any tendency to vibration at the top of the piles, to introduce a series of wrought iron ties one and a half inch in diameter, and extending in a diagonal direction between each pair of contiguous piles; that is to say, a heavy collar of cast iron made in two parts, secured by screw bolts to each pile at the surface of the rock, each of these being provided with two stout eye bolts at and below the collars to which the first series of braces are attached; a similar arrangement is to be fastened to the piles; then, extending from one of these collars to the other in a diagonal direction, is to be inserted the ties above named, each tie to be provided with a turn-buckle in order that it may be kept at the proper degree of tension. By this, these ties, acting like the stays or shrouds to a mast, will add to the stability of the top of the pile, and at the same time offer but a small surface for the sea to act upon.

Above this lower series of ties, a second is to be introduced above, extending from the lower series of horizontal braces to the upper series. These will be entirely above the reach of the sea, and will, without doubt, add stiffness to the upper piles.
This arrangement suggested itself to my mind when the first designs for the light-house were made; but, anxious to exclude every foot of surface exposed to the action of the sea, I suppressed the ties; but I am convinced now that they had better be introduced, not that I consider the additional strength imparted to the structure necessary for security against the effects of the sea, but to guard against and to prevent the vibration which high winds may produce. The sea itself appears to produce little or no motion in the structure, the aggregate surface of the piles exposed to its action being inconsiderable in amount; and therein, I may remark, consists one of the principal advantages of this peculiar mode of construction—the sea escapes through it, or eludes it, as Smeaton would express the idea. It is well known that, in the Bell Rock light, a column of the best description of stone masonry, 100 feet high, the effect of the sea in a gale of wind is sensibly felt in the light-house when struck by a heavy wave, and the same in other works of a similar class.

In the case of the Minot rock, the space to be occupied by the base of the light-house was limited, by the size of the rock, to one third of the height of the structure. Had a choice been permitted, I should have preferred a base of half the height, but, as remarked in the first report upon this work, there was no such choice to be exercised.

After Mr. Pomeroy, the contractor for drilling the holes in the rock and for erecting the iron piles, braces, and cast-iron cap in place, had completed his contract, I employed Mr. William Dennison, of Boston, to superintend the building of the living room, store-room, the lantern, and erecting the illuminating apparatus in place; all of which has been attended to with great perseverance, energy, and good judgment.

As stated in my estimate of the 31st, submitted to the bureau on that day, the sum required to be appropriated at the approaching session of Congress, to complete the payments for work and materials at the Minot, is four thousand dollars.


The balance remaining of the $5,000 appropriated for this work August 12, 1848, has been expended, except $25.61; that is to say, since the date of the last annual report upwards of 750 perches of heavy stone have been laid in the breakwater proper, completing that portion of the work, and the residue of the balance, except the sum above named, $25.61, expended in repairing the wall in front of the light keeper's dwelling-house.

This wall, as will be remembered, was built by the Treasury Department some twelve years since, and since its completion the sea has undermined it in several places. These breaches have been repaired from time to time, and other repairs will be required occasionally hereafter. The payments which have been made have of course diminished the fund which was originally intended for the work undertaken by the War Department; but, inasmuch as the destruction of the keeper's house would have resulted from neglecting to repair the Treasury Department wall, it has for that reason received attention whenever the inroads of the sea have rendered repairs necessary.

Some loose stone ought to be placed at the foot of the breakwater on the harbor side, as the stone is somewhat exposed there to the washing of the sea from within. For this purpose a sum of $250 would be ample.
I would recommend that about $1,000 be appropriated at the ensuing session of Congress, to be applied to the renewal of such parts of the Treasury Department wall as may, from time to time, be needful; and this sum would cover such slight repairs as the wall in question might require.

Total required for Fairweather island $1,250.

4. Wrought iron beacon at the harbor of Black Rock (Fairweather island.)

This beacon, which was built under my superintendence in 1843, by your directions, has answered fully the purpose for which it was intended. It occupies the precise site at which three stone beacons have been overthrown and destroyed by the violence of the sea.

I caused it to be painted with two coats of good red lead in June last, and the entire structure is now in perfectly good condition.

I would recommend that this beacon be painted with at least one coat of good paint each year. The expense will be about $12.

Very respectfully, sir, your obedient servant,

W. H. SWIFT,
Agent for United States.

Colenel J. J. ABERT,
Chief Topographical Engineer, Washington.

APPENDIX E.

Office of the Delaware Breakwater,
Philadelphia, September 12, 1849.

Sir: The following report of the Delaware breakwater for the year ending the 31st ultimo, is respectfully submitted.

The last appropriation for this harbor was made in the session of 1837-'38, and all operations in the prosecution of the works ceased, on the expenditure of the means thus provided; in 1839. Since that time the duties of superintendence have been confined to a general supervision of the works, to the custody and preservation, as far as this was possible, of the public property, and to keeping up the light at the harbor; and constitute, in consequence, with a single exception, the detail of the usual annual reports, submitting estimates to continue the construction. The exception is in the case of the report of 1843, (Doc. No. 85, 24th Congress, 1st session, Ho. of Reps, War Department,) the next succeeding to, and for the most part based-upon, the survey of the previous year. This report embodies many interesting statistical details elicited in the course of construction, and demonstrates, by a statement of the number of days' shelter it has afforded, the usefulness of the harbor as a harbor of refuge. A like statement is now also presented, brought down to the 30th of May of the present year, from which date no record has been kept, in consequence of the agent of this office being obliged to yield up his residence on the works.
Statement showing the number of days' shelter afforded to vessels by the harbor of the Delaware breakwater, from September 1, 1833, to May 30, 1849, inclusive; omitting the periods embraced between July 1 and October 17, 1834, and June 4, 1840, and April 30, 1841, when no record was kept; and also omitting vessels carrying stone for, or otherwise connected with the works.

<table>
<thead>
<tr>
<th>Years</th>
<th>Ships</th>
<th>Brigs</th>
<th>Schooners</th>
<th>Sloops</th>
<th>Pilot boats</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1833</td>
<td>822</td>
<td>178</td>
<td>279</td>
<td>167</td>
<td>127</td>
<td>866</td>
<td>From September 1, inclusive.</td>
</tr>
<tr>
<td>1834</td>
<td>485</td>
<td>315</td>
<td>667</td>
<td>303</td>
<td>411</td>
<td>1,744</td>
<td>July 1 to October 17, inclusive; not recorded.</td>
</tr>
<tr>
<td>1835</td>
<td>133</td>
<td>569</td>
<td>1,719</td>
<td>461</td>
<td>644</td>
<td>3,526</td>
<td></td>
</tr>
<tr>
<td>1836</td>
<td>301</td>
<td>1,021</td>
<td>2,719</td>
<td>620</td>
<td>767</td>
<td>5,434</td>
<td></td>
</tr>
<tr>
<td>1837</td>
<td>237</td>
<td>478</td>
<td>2,771</td>
<td>629</td>
<td>732</td>
<td>4,943</td>
<td></td>
</tr>
<tr>
<td>1838</td>
<td>165</td>
<td>732</td>
<td>3,191</td>
<td>765</td>
<td>655</td>
<td>5,336</td>
<td></td>
</tr>
<tr>
<td>1839</td>
<td>165</td>
<td>504</td>
<td>3,381</td>
<td>734</td>
<td>697</td>
<td>5,661</td>
<td></td>
</tr>
<tr>
<td>1840</td>
<td>172</td>
<td>279</td>
<td>1,908</td>
<td>308</td>
<td>371</td>
<td>3,039</td>
<td></td>
</tr>
<tr>
<td>1841</td>
<td>111</td>
<td>902</td>
<td>3,916</td>
<td>590</td>
<td>483</td>
<td>6,003</td>
<td></td>
</tr>
<tr>
<td>1842</td>
<td>107</td>
<td>1,060</td>
<td>5,335</td>
<td>803</td>
<td>794</td>
<td>8,098</td>
<td></td>
</tr>
<tr>
<td>1843</td>
<td>103</td>
<td>1,133</td>
<td>4,981</td>
<td>1,167</td>
<td>792</td>
<td>7,044</td>
<td></td>
</tr>
<tr>
<td>1844</td>
<td>531</td>
<td>969</td>
<td>5,797</td>
<td>634</td>
<td>744</td>
<td>8,595</td>
<td></td>
</tr>
<tr>
<td>1845</td>
<td>265</td>
<td>1,042</td>
<td>5,446</td>
<td>597</td>
<td>776</td>
<td>8,126</td>
<td></td>
</tr>
<tr>
<td>1846</td>
<td>259</td>
<td>1,035</td>
<td>6,711</td>
<td>614</td>
<td>751</td>
<td>9,989</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>342</td>
<td>1,937</td>
<td>7,749</td>
<td>358</td>
<td>874</td>
<td>11,253</td>
<td></td>
</tr>
<tr>
<td>1848</td>
<td>340</td>
<td>2,457</td>
<td>6,837</td>
<td>374</td>
<td>910</td>
<td>9,042</td>
<td></td>
</tr>
<tr>
<td>1849</td>
<td>83</td>
<td>804</td>
<td>3,261</td>
<td>168</td>
<td>553</td>
<td>5,413</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3,319</td>
<td>14,719</td>
<td>66,141</td>
<td>9,511</td>
<td>11,149</td>
<td>104,839</td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
- From September 1, inclusive.
- July 1 to October 17, inclusive; not recorded.
- To June 3, inclusive.
- From May 1, inclusive.
- To May 30, inclusive.
A statement is also given from records made expressly with a view to that object, to the effect that the advantages of the harbor "to general commerce and the local trade, are in the relation of four to five."

Besides these statistical details, the report gives:

1st. A statement of the sources from which the means for the support of the light had, to the close of the year, been derived.

2d. An account of the origin of the harbor, of the objects sought to be gained by its construction, and also of the position, plan, and dimensions of the works.

3d. A statement showing the extent to which the design had been carried out.

4th. A notice of the action of the board of survey of 1834, on the shoal formation, which as early as 1831, in the progress of the work, had appeared just within the west end of the breakwater proper; and

5th. The reasons for believing this shoal, and indeed all the other shoals resulting from the works, had nearly, if not fully, reached their utmost probable extent.

The report then goes on to state in what respects the harbor, as far as completed, has failed to accomplish the objects had in view by its formation and attempts to discuss, accompanied by estimates of cost, the relative advantages of three several plans to correct the principal defect, namely: from so much of "the action of waves caused by the wind blowing from east to northwest round by the north," as is raised by the east north-east winds, to which the harbor is at present obnoxious. These plans are:

1st. To cover the gap by extending the ice-breaker;
2d. To cover the gap by extending the breakwater proper; and
3d. To cover the gap by a detached work.

The absence of protection to vessels in the harbor from running ice is also adverted to, and a proposition made to correct the evil by means of iron screw-piles. The opinion of the board of survey, namely: that operations be confined to raising the present works to the proposed height, and that any modification of the design of the harbor would be premature until this was done, and further information obtained in reference to the shoal formations, is then endorsed, when the report concludes with the recommendation made as far back at the 16th of September, 1839, in a communication of that date on a special occasion, in the following words: "That whenever it shall be determined to extend the works beyond their present limits, a board of officers of experience be formed, to report what, if any, modifications are, in their opinion, necessary to carry out the design originally had in the formation of the harbor."

As the circumstances under which these several subjects, saving one, were considered in the above mentioned report remain unchanged, the bureau is respectfully referred to that report, in which each is treated somewhat at large. Whatever consideration attaches to the views, opinions, and recommendations then given, loses none of its value by lapse of time. They are, therefore, now again with like confidence presented. The exception referred to is with regard to the harbor light, the history of which is brought down in the report to the close of the year 1843 only. At that date the means at the disposal of this office for the maintenance of the light were exhausted.

The board of underwriters of Philadelphia becoming acquainted with this state of things, and being fully impressed with the importance of the light,
not only to the trade of the Delaware, but also to the coastwise trade generally, assumed its support, and did so support it until the 30th of June, 1846, a period of two and a half years, at an outlay of $2,460 48, of which sum Congress, in the session of 1845-'46, reimbursed $1,600, leaving a balance of $860 48 still in advance by the board. From June 30, 1846, to the present time, the light has been sustained by the Treasury Department, the agent of this office having charge of the public property at the harbor being continued as light-keeper until the 21st of May last, when he was superseded by that department. Subsequently to this change, the possession of the dwelling on the breakwater proper, of which the light is a mere appendage, was yielded up to the agent of the Treasury Department, in compliance with the orders of the bureau of the 8th of June.

During the past season, a new light has been erected on the breakwater proper. It is provided for in the general light-house bill of last session. The same bill makes appropriation for two light houses and one beacon, "to be expended under the direction of the Bureau of Topographical Engineers." It is a matter of regret that, as the harbor of the Delaware breakwater is still in course of construction, and in charge of the bureau, a like provision was not made in favor of this light also; and that, failing in this, a transfer was not directed by executive authority, as was done in the case of the light-houses for Flynn's Knoll and Brandywine shoal. In the absence of any such action, the erection of the new light, as a matter of course, devolved on the Treasury Department, which having deferred to the bureau on the subject of the proper site only, is responsible for the work, both in the plan and execution. It is proper to state here, with regard to the site selected, that the reports from this office, to which the subject had been referred, in consideration that the contractors were already on the ground, examined the question solely with reference to the present state of the works; whereas, had the entire matter been within its control, the extreme verge of the breakwater proper, though involving the time and cost of filling up the deep hole and finishing off the work at that point, would have been chosen. For these reports and the correspondence generally, which took place on the occasion of erecting the new light and of removing the agent of this office as the keeper of the old one, the bureau is referred to its own files.

Estimate for completing the works on their present bases—the breakwater proper to 15 feet, and the ice-breaker to 12 feet above low water:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,584 tons of stone, pieces of two tons and upwards, for the breakwater proper</td>
<td></td>
<td>$3 per ton</td>
<td>$52,761 00</td>
</tr>
<tr>
<td>9,054 tons of stone, pieces of two tons and upwards, for the ice-breaker</td>
<td></td>
<td>$3 per ton</td>
<td>$27,162 00</td>
</tr>
<tr>
<td>15,827 tons of stone, pieces less than one fourth of a ton, to raise the bottom at the ends of the breakwater proper, to the level of forty feet below lowest spring tides</td>
<td></td>
<td>$1 75 per ton</td>
<td>$27,607 25</td>
</tr>
<tr>
<td>Renewal of machinery, &amp;c., cranes, crabs, shears, boats, buoys and buoy-chains, rope, blocks, hand-spikes, water-barrels, spikes, nails, &amp;c., &amp;c., necessary on resuming operations</td>
<td></td>
<td></td>
<td>7,750 00</td>
</tr>
<tr>
<td>Barracks on the works for men, including bunks, cambooses, mess furniture, &amp;c.</td>
<td></td>
<td></td>
<td>2,000 00</td>
</tr>
</tbody>
</table>
Reimburse board of underwriters of Philadelphia, balance of sum advanced by them for support of light from January 1, 1844, to June 30, 1846.

<table>
<thead>
<tr>
<th>Amount</th>
<th>118,230 73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingencies, at 17½ per ct.</td>
<td>20,690 38</td>
</tr>
<tr>
<td>Total amount</td>
<td>138,921 11</td>
</tr>
</tbody>
</table>

The estimate differs slightly in the aggregate from the one which accompanied the report of 1843. Some items are stricken out, others changed, and a new one inserted. The quantities of stone under the first and second heads are now deduced from more accurate measurements, both of the breakwater proper and the ice-breaker; and the quantity for the latter is further modified by giving that work a height of 12 instead of 10 feet above low water. An increase, also, for "renewal and repair of machinery," &c., has become necessary, by the almost total destruction, since the close of operations—now ten years—of all property under this head. The balance of the sum advanced by the board of underwriters of Philadelphia in keeping up the light is likewise added as an actual arrearage. On the other hand, the items for "extraordinary emergencies, such as the destruction of the light house, the current expenses," and "probable arrearage" of the same, are omitted, as the light is no longer in charge of the War Department, and the probable arrearage gives place to an actual one. Again: the heavy item for iron "screw piles, and fixing the same," as a "protection against ice," is also omitted, to conform the estimate to the recommendation that the operations be confined to completing the works on their present lengths.

True economy requires that, as the contingent expenses in such operations are nearly the same, whether the quantity of stone deposited be large or small, the whole amount of the estimate be appropriated at one time. No serious inconvenience, however, would arise, were the sum divided between two consecutive fiscal years. The remnant of the season of the first year may be profitably employed in building the barracks for the men, erecting cranes, &c.—measures necessary preparatory to receiving the vessels carrying the large-size stone required for the works above water, and in depositing the small-size stone provided for filling up the bottom, an operation which requires no such arrangements; and the next season, in receiving and bedding the large-size stone, the contracts for which may be so framed that no payments be made until after the commencement of the second fiscal year. Under this division of labor, the first year would require the aggregate of all the items in the estimate, with the exception of the first and second, amounting, with contingencies, to $45,011 58; and the second, the balance of the estimate, or $93,909 53.

I desire, though not strictly within the province of superintendence, to call attention to the necessity of providing a hospital in connexion with this harbor.

The number of vessels which resort to the harbor, or, more properly, the number of days' shelter afforded to vessels by the harbor, is now very large. During last year, as shown by the table already given, there were 9,126 vessels, requiring 74,387 men to navigate, or an average of 25 vessels and 204 men for every day. For each of the previous two years the
number of vessels, or days' shelter to vessels, was even still greater. It is now a very rare occurrence that no vessels are seen in the harbor; 100 are frequently lying in it at the same time; and on the 27th of August, 1848, as many as 141, with crews numbering 1,149 men, were congregated in it. On one occasion, the 4th of July of the present year, it is said the fleet reached the extraordinary number of 240, requiring 1,956 men for their crews; but as the statement is not authenticated by the record, which, as stated, was discontinued because of the removal of the agent of this office from the works, it is not relied on in support of the present views. For this purpose, the facts established by the record are sufficient. In estimating the number of men, the crews for the different classes of vessels are rated as follows: for ships, 16; for brigs, 11; for schooners, 8; for sloops, 5; and for pilot-boats, 3. If passengers were taken into account, the results given would in every instance be very considerably increased. The record also shows that the number of vessels seeking the protection of the harbor has, with slight fluctuations, steadily increased from the first. In the early years of its existence, this was owing in a great measure to the extension, from time to time, of the works; but as they attained their present dimensions, in 1839, no part of this increase, the ratio of which is quite as great as it was previously, can be referred, since that year, to this cause, but it is properly attributable to the increase of trade, and the growing confidence of navigators. This fact, interesting generally in connexion with the harbor, is here put forth as evidence that a hospital for that most important roadstead is not likely hereafter to lose any of its usefulness.

The foregoing statements are of themselves sufficient to show how largely the class most interested, and which furnishes the means in whole or in part for the maintenance of marine hospitals, is likely to be benefited by the establishment of one of these provident resorts at the locality in question. But the subject has derived unusual interest from recent events of a most piteous character. During the present year the harbor has received within its waters three vessels, on board of which disease and death were exhibited in the most appalling forms. The first was the British ship Cambria, bound to New York, with immigrants. She put into the breakwater in distress, after a voyage of 91 days, short of provisions and water, and with sickness among her passengers, 55 of whom died at sea, and 17 after her arrival. The second, the schooner Martha Collins, from Norfolk, bound also to New York, with cholera on board, two of the crew dying shortly after coming to anchor. And the third, and under by far the most distressing circumstances, the three-masted schooner Florida, from Chagres, destined for the same port. This vessel was boarded, apparently abandoned, by a Delaware pilot-boat, about twenty miles from the capes. Three of her people had already died of the yellow fever, and the master and remainder of the crew were found below, sick with the same disease, and so entirely helpless as to be unable to navigate the vessel. In this condition she was towed into the harbor. The scene on board, both as regards the dead and the sick, is described as revolting in the highest degree to every feeling of humanity. The first case may not properly, except as to the crew, come within the objects of a hospital of the character of the one proposed. Of the other two there can be no doubt. In every instance the inhabitants, including the physicians, of Lewes, as well as others, ministered with most commend
able assiduity to the wants of the sufferers; and yet it will not be doubted their condition, both the healthy as well as the diseased, would have been greatly ameliorated had there existed a suitable refuge on shore to receive the latter.

In suggesting a hospital at the Delaware breakwater, it is with no view to an establishment costly either in the first outlay or in the current expenses. As no chronic cases should be admitted, and those that became so might be removed, the accommodations of at most a dozen beds, in a plain building designed for the purpose, would be sufficient, except under very extraordinary circumstances, to meet the wants of the harbor. The cost of maintenance would also, for a large part of the year, be confined to the compensation of a physician and a matron, with (say) one nurse, to keep the house in order—a discretionary power being given to the former to obtain additional temporary assistance as occasion may require.

I have the honor to be, sir, very respectfully, your obedient servant,

HARTMAN BACHE,
Major Topographical Engineers, Brevet Major.

APPENDIX F.

PHILADELPHIA, October 4, 1849.

Sir: Upon being assigned, early in April last, to the charge of the lighthouse to be erected on Carysfort reef, Florida, I found the various parts, as originally designed, in a satisfactory state of forwardness.

The cast-iron work was being executed by Messrs. Merrick and Torone of this city, except the lantern, which was made in Boston. The lantern, and the lumber for platforms and for the house, had already been shipped to Key West. The illuminating apparatus, which is to be that of Fresnel, had been ordered from Paris.

My predecessor, Captain Stansbury, corps of topographical engineers, had wisely determined to erect at the foundry those parts of the work most complicated in structure, in order that any errors—the liability to which was very great in a work of such magnitude and numerous details—might be corrected there, thus avoiding the embarrassment which would be caused by the discovery of errors while erecting the light-house on its permanent site.

The general form of the light-house, as you are aware, is a skeleton tower, composed of a frustum of an open octagonal pyramid resting upon an octagonal prism of equal base, with a vertical central post rising to the base of the lantern. In the experimental erection only the pyramidal part of the tower has been put together, the lower angle sockets, which connect it with the prismatic base, resting on discs placed on the ground.

Upon reaching the elevation of the top of the dwelling, it was perceived that a moderate force would produce a considerable oscillation of the tower, with a tendency to torsion.

The entire tower, independently of the lantern, may be considered to have seven planes of perfect rigidity, as follows:

1. At the surface of the foundation rock.
2. At the lower series of radial and periphery ties, 15 feet 8 inches above the rock.
3. At the floor of the lower story of the dwelling, 21 feet 6 inches higher.
4. At the floor of the upper story of the dwelling, 7 feet 2 inches higher.
5. At the roof of the dwelling, 10 feet 6 inches higher.
6. At the upper series of radial and periphery ties, 22 feet 5 inches higher.
7. At the base of the lantern, 17 feet 8 inches higher.

The original plan of the light house did not include a system of diagonal bracing; the structure, it was supposed, would be rigid enough by means of its radial and periphery ties. The necessity for their introduction became apparent, as I have above stated, before we had attained to a great elevation in the experimental erection.

The dwelling is a conic frustum, sufficiently rigid between planes 3 and 5 to resist any tendency to change of form. The application of braces to oppose the movement of oscillation, and of torsion, was therefore only necessary between the planes 1 and 2, 2 and 3, 5 and 6, and 6 and 7. Accordingly, at the middle points of the angle posts between planes 2 and 3, 5 and 6, and 6 and 7, clamp collars were adjusted, and tension braces of one and a half inch iron, with turn-buckles, were carried therefrom to the intersections of the adjacent angle posts with the planes of rigidity above and below. Radial braces were also arranged to corresponding points of the central post from the same collars on the angle posts. Above the dwelling, the tubular casing of the spiral stairway made it necessary to attach the inner ends of two sets of radial tension braces to the upper radial horizontal ties. Between planes 1 and 2, the size of the tension braces was increased to two inches diameter, and such an arrangement made of the radial diagonals as to resist the thrust of the pyramidal frustum at its junction with the prismatic base.

The introduction of these braces has greatly increased the stiffness of the tower, which, it is now believed, will have very little motion during the most violent gales.

It was at first proposed to carry on the experimental erection no higher than the top of the dwelling; but upon reaching that altitude, the expediency of putting up all the parts that had not been shipped to Key West had become apparent; I therefore continued to erect the tower, which was completed by the close of July.

On the 20th of August, we commenced taking down the work for shipment to the Florida reef, the 10th of October being the time fixed for sailing from this port. I have not thought it prudent to sail sooner, on account of the violent gales which blow in the southern latitudes during September and the early part of October.

The difficulties of this undertaking will in reality only commence when we shall begin to erect the light-house on its permanent site. These difficulties depend on the exposed character of the position selected, which is at all times covered with water; on the nature of the sand, which is calcareous, and has a specific gravity little greater than that of water; and on the distance, over deep water, that it will be necessary to transport the large amount of heavy materials in boats and scows.

The first step to be taken after arriving at the reef, will be to discharge the vessels at the most convenient point to serve as a depot. This will be indispensable as a measure of safety for the materials, and in order that the two smaller vessels may be available as lighters and despatch boats.
Indian Key, about 40 miles to the southwest of the contemplated site, is believed to be the only place that can be used for this purpose. One of the small vessels will immediately be employed in bringing forward all the materials now stored at Key West, and the other two vessels, with the materials required to begin operations, will be moored behind the reef, as near as practicable to the site of the work.

Having provided for the safety of the vessels, we shall proceed to erect a platform on piles, on which to lay out the work and arrange the machinery for hoisting and for boring the rock. The latter operation will be attempted with the jumper-drill and with an auger, for it is not ascertained which mode of boring in the coral rock will be most expedients.

The holes for the posts, which are to be 14 inches in diameter, and 10 feet deep, can, I think, be bored in open water, if a spot can be found tolerably clear of sand. A more difficult operation will be to reduce to the same plane nine spaces of 4 feet diameter, to receive foundation discs through which the angle and centre posts of the lower series are to pass. To accomplish this, it will, perhaps, be necessary to make use of coffer dams. I propose to use small cylindrical coffer dams of iron, merely large enough to enable two men to work on the bottom.

In designing a novel and extensive work like the Carysfort light-house, many details are overlooked, and the omissions must be supplied as the work advances. The cost of such works swells beyond the estimates; and although I have practised the most rigid economy in the disbursements for the Carysfort light, I find myself compelled to ask for an additional appropriation.

The revised estimate of Captain Stansbury required—

For the cost of erecting the work on Carysfort reef, the parts being completed $15,000
Outfit of three vessels 2,500
Provisions for thirty-five men, six months 1,500

Total 19,000

This estimate is too small. An additional vessel has been found necessary, and the number of men required for the erection cannot be reduced below fifty.

The estimate corrected will be as follows:

Cost of erection $15,000
Outfit of three vessels 3,750
Subsistence of fifty men, six months, at 50 cents per day 4,500
Pay of assistant engineer and clerk, six months 1,260
Storage, wharfage, freight, repairs of vessels 3,740

28,250

The length of time that will be necessary to erect the light-house on the exposed site selected, cannot be determined with any certainty. It is quite probable that serious losses and great delay may be caused by the occasional destruction of the platform during severe gales. The great distance of the Carysfort reef from resources of all kind, makes it imperative to assemble on the spot a liberal amount of materials and machinery for
the establishment of the foundation piles of the light-house. This is an
operation of the greatest difficulty, and there is but little in the experience
of the profession to guide us in accomplishing it. The loss of an import-
ant piece of machinery will involve the most serious delay, unless the
means are at hand of supplying its place. The necessity for making a
large provision for contingencies in the estimate must, therefore, be ob-
vious; and in view of the extraordinary difficulties which this work pre-
sents, and the danger of casualties during gales, I do not think forty per
cent. will be an extravagant allowance.

The estimate would then stand
Add 40 per cent. for contingencies
Total required to erect light

On the 1st October the funds in my possession amounted to
Balance in the treasury

Of this sum, will be required to pay—

Foundry bills
Cost of illuminating apparatus
Other bills partly rendered

Leaving as the balance available for the erec-
tion of the light-house

Balance required to be appropriated
To which, with your approbation, I would add, to procure a
model of the light-house

Total

The diagonal bracing, as before stated, was not included in the design
of the work, nor did the estimate include the cost of the experimental
erection. These operations, together with the care and repairs of vessels,
sails and rigging, freight, storage, pay of assistant engineer and clerk,
hauling and stowing, wharfage, &c., not provided for in the original esti-
mate, have cost about $18,340.

I cannot close this report without expressing the high sense I entertain
of the ability and zeal of Mr. J. W. P. Lewis, the assistant engineer,
who has been engaged on this work since its commencement, and of whose
valuable services I shall avail myself in the more difficult task of erecting
it on the Carysfort reef.

I am, sir, very respectfully, your obedient servant,

T. B. LINNARD,
Brevet Major Topographical Engineers.

Colonel J. J. ABERT,
Corps Topographical Engineers, Washington.
Oswego, N. Y., October 20, 1849.

SIR: In conformity to your instructions, I have the honor to submit the following report in relation to the harbors on Lake Ontario.

1.—Works at the mouth of Salmon River, New York.

Operations at this harbor were commenced in 1836, and although not yet carried to the extent contemplated, already afford valuable protection to vessels driven by the prevailing north and northwest gales into Mexico bay. Before the commencement of the work, shipwreck was the almost certain fate of the navigator when driven within its jaws; now, vessels of medium draught find ready shelter, and those of the larger class will soon be able to seek it with safety. Vessels can now carry in eight and a half feet water, but the channel, which is somewhat obstructed by sand-bars, is too intricate and shallow for vessels of this class. No doubt is entertained that the plan already sanctioned by the chief of the bureau will effectually remove these obstructions, with, perhaps, some little aid from the dredge.

The crib-work has been well and substantially built, and, considering the nature of the bottom, has kept its place remarkably well. The end of the north pier is somewhat broken up, but, on account of the change of site, will not require further outlay.

The estimates of November, 1845, having been carefully considered by the superintendent, are adopted and respectfully submitted for renewal. As, however, some repairs, not then anticipated, will now be required, and new scows, tools, &c., must be procured on the resumption of the work, I would increase the estimate to $70,000, viz:

For the south pier, pier head, and light-house—$41,880 36
For the north pier—27,453 66
For repairs and new machinery—665 98

Amount of estimate—70,000 00

Of this amount I would recommend that the sum of $20,000 be appropriated for the service of the ensuing year.

Value of its commerce.—The usual facility of the customs-house records cannot be resorted to successfully here, as most of the trade is with Oswego, a port in the same district; and it is not necessary to make a formal report.

The foreign trade is inconsiderable. Under such circumstances my best reliance is upon the books of mercantile houses. I have not been able to procure a statement for the calendar year of 1848, but for the fiscal year ending July, 1849, which cannot materially differ. On this statement, for which (with valuable aid in conducting my examination of these works, constructed under his superintendence) I am indebted to W. H. Petes, esq., of Pulaski, I found my estimates of the value of its commerce—

Foreign and domestic imports—$1,335,636 24
Foreign and domestic exports—1,075,553 30

Total—2,411,189 54
This harbor, at the mouth of the Oswego river, is the point of transshipment for the trade of the West, passing through the Welland and Oswego canals. Its importance in a military as well as commercial point of view has been already fully set forth in former reports, and need not now be urged. It has acquired a position which secures it against being overlooked in any plans for the improvement of the great valley of the northern lakes, and the development of its resources.

The works at this point, constructed among the earliest of the lake harbors, have now become so weakened by the lapse of twenty years, that they are liable to be broken up and overthrown at any time. Since the close of operations in November, 1846, three extensive breaches have been made in the piers, besides many minor injuries, each of which, unless repaired, would have continued to extend itself until the entire pier should be swept away.

The first commenced November 26, 1846, near the pier-head of the east pier, and carried away one hundred running feet of pier and a counterpart thirty feet square. A small balance of the appropriation remaining; I was able to close up the end of the largest and uninjured portion. The isolated pier-head and thirty feet adjacent, equal to ninety feet of crib-work, could not be saved, and was swept away by a severe storm in December following. This pier also suffered injury by the loss of its plank, the breaking up of its decayed timbers, and the removal of its filling-stone at various points.

In the winter of 1847-'48, a similar disaster occurred to the west pier, opening a breach of one hundred feet and upwards in that part just opposite the marine railway, while the parts adjoining, equally weak, and now open to the attacks of the waves on either side, were soon to follow.

In December, 1848, still another breach, about one hundred feet in length, was made in the main east pier, near the angle formed by it and the pier running to the shore. This breach was gradually widened by successive storms until six cribs were swept away, and serious injury inflicted upon the two next the breach. In both cases, the east pier, when broken up, was carried away, quite to the bottom, while all former injuries had usually gone no farther than about the surface of the water.

These events seemed to confirm the opinion, so often urged, that no reliance could be placed on these time worn piers; and that they are now daily and hourly liable to be swept away. A few patriotic and public spirited citizens, seeing no hope of saving the piers from destruction, and the harbor from being filled up with the ruins, stepped forward and contributed from their own private funds the means for preserving the harbor. Subscriptions are now before me, whose aggregate amount is about $9,000. Besides these sums from private hands, the city of Oswego has appropriated, during the years 1848, '49, the sum of $9,000 for the improvement and preservation of the harbor. These facts, while they tell loudly of the spirit and enterprise of those citizens who have thus manfully "put shoulder to the wheel," also speak, in terms not to be misunderstood, of the value of the harbor they seek to preserve. When such sacrifices can be made in times of great depression by those who see and know, we cannot doubt that the harbor ought to be sustained. By this timely aid placed in my hands for disbursement, I have been able to rebuild the inner half of the main east pier for eight feet above the water, to replace the
parts carried away in 1848-'49, and, by a temporary breakwater, to protect the west pier at its weakest point from farther injury. I have no hesitation in saying that, but for this, the remainder of the east pier, and doubtless a large part of the west pier, would now be strewn over the harbor.

In connexion with the repair of the piers, and by aid of the same funds, a dredge was procured and placed upon the bar, which has removed about 11,000 cubic yards, and opened a channel eleven feet deep, which enables the largest class of vessels to enter the inner harbor. The lake is at a very low stage; and, but for the dredging, only from five to five and a half feet of water would now be found on the bar. This operation, just completed, will be a great benefit to the harbor; but gratifying as are these results, the fruits of individual efforts and municipal enterprise, they cannot often be repeated. Commerce laden with such burdens will cast them off, and seek some other avenue; and the municipal authorities of a young community, who, upheld by the stimulus of emergency, can achieve great things, may well shrink from imposing new and heavy burdens of a permanent character on their fellow-citizens.

There is no safe reliance but upon that power which is charged by the constitution with the regulation of commerce, and which imposes taxes on that commerce sufficient not merely to sustain all necessary works, but even for the support of the government itself. It follows, then, if the harbor be worthy of preservation, that to the general government alone can we now look for that protection which the nature of the case requires. The portions of these old piers already renewed by private enterprise are daily and hourly in danger of being swept away by the sea. They have already stood twenty years and upwards, and it is not within the bounds of human probability that they can hold out much longer. The experience of the last three years proves that these are no idle forebodings. But it is not the loss of the piers alone that is to be feared: through every breach the waves roll the masses of filling-stone into the harbor. Vast quantities of shingle, gravel, and sand are also borne along, adding to the bar which has hitherto obstructed it.

Again, the east pier having lost 160 feet in length at the mouth of the harbor, and having had another opening of about 200 feet at its eastern extremity, the current passed out with diminished velocity, and was met by the incoming wave at a point farther up the stream; therefore, we should look for a deposite of sand, &c., at or near the mouth of the harbor. My examinations show that a bar had begun to form near the light-house, on which was from fourteen to eighteen feet water, where formerly I found from twenty to twenty-five feet. As yet, this accumulation has had no other effect than to show the tendency which there is to a deposite at or near the entrance. As this has never been known before the breaking up of portions of the east pier, it is hardly possible to ascribe it to any other cause. Doubtless when the channel shall be restored to its original width, the force of the current will remove this deposite.

The superstructure of masonry is generally in good condition. In order to test the ability of the concrete to resist abrasion, the general superintendent desired it to be freely exposed to the action of the sea. This was effected by allowing the temporary breakwater to go to pieces during the winter after the work was finished. The constant abrasion caused by the masses of sandstone, of which the mole at the foot of the wall is composed, has worn away the concrete to such a degree as to require the protection of a facing of limestone to secure it. This contingency, as one likely to happen, was provided for in the construction, by using broad
masses of limestone for the lower course, in order to be able to introduce
the face stone, if circumstances should render it necessary. The failure
of all appropriations prevented this remedy being applied; and there is now
danger of the abrasion going so far as to undermine the outer face. Some
stones have already yielded; but I hope to be able to secure the wall, with
means at my disposal, so as to prevent further injury for the present.
Even solid masses of limestone are worn down by the constant grinding
of one stone upon another, and the concrete (which appears to have about
the resistance of the gray sandstone of this region) is not able to withstand
it. With this modification, (a course of sandstone on the outside,) I con­sider the use of concrete a great saving of time and money. Whether it
would be able to resist the action of the waves, unaided by so powerful an
auxiliary as the sandstone, I am not able to say from experience, but I
think it would. The concrete put down in 1839 still holds out, partly
because better guarded, but more especially, I think, because it was not
exposed to the action of the sea until two years had given it the requisite
hardness to resist the abrasion.

Having presented revised estimates in detail, in my report dated Febru­
ary 7, 1849, (pages 9 to 14,) I beg leave to refer to them, and to that por­tion
of my report having relation thereto, (from page 1 to page — in­clus­ive,) as a fair exposition of what remains to be done. They were based
on its condition at that time and the actual cost of workmanship and mate­
rials. Some changes have taken place, but the general result will not be
materially affected. On the one hand, some repairs have been made by
private enterprise; on the other, a large addition has been made to the
estimated cost of dredging, by the influx of sand and gravel through the
breach.

I will now recapitulate the amounts of the several estimates:

1st. Restoring lost parts of east pier - - $12,524 37
2d. Rebuilding rest of the east and the west pier - - 30,796 97
3d. Enlargement and reinforcement of west pier-head - - 5,099 17
4th. Finishing of superstructure of masonry of west pier - - 101,809 33
5th. Finishing superstructure of masonry of east pier - - 68,172 95
6th. Removing obstructions in the harbor to 12 feet, low
water mark - - - 64,986 18

Amount of estimate - - - 283,388 97

For the service of the ensuing year, I would recommend
that the amount of estimates 2 and 3 be appropriated,
viz: - - - $48,420 51

Value of the foreign and domestic trade, &c.

From a statement carefully prepared at the custom-house, and published,
under the sanction of the collector, January 12, 1849, I derive the follow­
ing facts, viz:

Value of foreign imports - - $610,701 86
Value of coastwise imports - - 6,410,651 14

Value of domestic and foreign imports - - $7,021,353 00
Doc. No. 5.

Value of merchandise exported to foreign ports - $2,187,606 00
Value of merchandise exported coastwise - 7,967,018 00

Value of exports, exclusive of salt - $10,154,624 00
Salt exports to American and foreign ports - 411,917 00

Total value of foreign and domestic trade - 17,587,641 00

Enrolled and licensed tonnage of Oswego.

Steam vessels - 3,740 44
Sail vessels - 17,968 44
Total tonnage - 21,708 88

Number of men employed, 1,549.

Duties.

Amount of duties collected in 1848 - $43,123 12
Amount of duties bonded - 67,644 67

Amount of duties collected at the custom houses at Oswego and New York, on Oswego account - 110,767 79

3.—Big Sodus Bay.

The next harbor westward is that of Big Sodus bay. This fine bay has ample area and depth of water for fleets of the largest class to lie at anchor, sheltered from every wind by its projecting points and large islands. The entrance to the natural harbor was closed by a bar, formed of gravel and small stone; the object of the improvement being to remove the bar for a space wide enough for vessels to gain the deep water within. This has been accomplished by closing the entrance with two harbor piers, and then confining the water between two parallel piers, with the design that the ebbing and flowing of the waves should prevent further accumulation. Dredging was also resorted to, in order to remove material too heavy to be dislodged by the current.

The timber above water is now quite rotten, and gives little if any strength to the work. The channel pier having been rebuilt from the ordinary level of the water, in 1844, and planked anew, is now in good condition. With the exception of a further settling of the cribs at one point, the piers stand well, and indicate that they have reached their proper beds. The east channel pier was rebuilt in like manner, in 1845, with the exception of about four hundred feet. A part of this has the rotten timbers removed, for rebuilding; but this being sheltered by the west pier, the filling stone left piled on the pier seem not to have been moved. The east and west harbor piers are both in a most wretched condition; the planks and timbers are so much decayed that bolts and spikes can be drawn
by the hand alone. The east pier should be rebuilt at once, and the west channel pier for about six hundred and sixty running feet. Beyond that distance the beach begins to afford good protection, and seems advancing steadily towards the channel pier. The water line is at present three hundred and thirty-five feet from the southwest angle. The water of the lake is at a very low stage, and vessels cannot enter with more than nine feet.

The long looked-for ship canal, to connect Big Sodus bay with the Erie canal, giving immense water power, would at once open up a new field for industry and enterprise, and give another important advantage to this harbor—that of a communication with the interior. The friends of the enterprise consider its completion now secured. As the first appropriation should be applied to repairing and preserving the piers, I beg leave to renew the estimates of 1845, based on the actual cost of similar work, and to recommend that the amount be appropriated for the service of the ensuing year.

Rebuilding west pier from channel to shore, 660 feet long ............................... $2,683 80
Rebuilding east harbor pier in timber and stone, 1,440 feet long ........................................ 5,346 00
Rebuilding the remainder of the east channel pier, 330 feet long ........................................ 1,266 59

Contingencies, 10 per cent. ........................................................................................................ 9,296 39

Amount of estimates for repairs .............................................................................................. 10,226 03

The channel has been dredged only one hundred feet wide, while the distance between the piers is about five hundred feet. The channel should be cleared to the depth of twelve feet, low water mark; and for a width of not less than two hundred feet. For this purpose I submit an estimate for dredging 53,333 cubic yards, at twenty-five cents per yard, $13,333 25; which, added to the estimate for repairs, gives $23,556 28, required to complete the work. This amount, it is believed, will place the present work on a safe and effective footing. But before the timbers used in the repairs of the piers in 1844 and 1845 shall show signs of decay, arrangements should be made to rebuild such parts as shall then seem to require preservation, with permanent materials.

Value of its commerce.

No records or memoranda could be found in the deputy collector's office; and as this office reports to Oswego, its transactions are all merged in the latter port: its trade being for the most part with Oswego, a port in the same district, no entrance or clearance being necessary, and, consequently, the vessel and cargo do not appear on the records. I have ascertained from the books of commercial houses the shipment to Oswego of 28,504 bushels of wheat, in 1845; value, $28,504. The trade consists mostly of the surplus products of a limited agricultural district, such as fruits, wheat, &c.
The works at this point have been attended by signal benefits to the lake commerce, giving a safe and easy entrance for vessels of the largest class, instead of the narrow and tortuous course of the stream in its natural condition. The lapse of time has, however, shown itself here also in the decayed and crumbling timber work, whose precarious condition calls for prompt action to save it from a fate similar to that of other portions of the pier restored, at great cost, in 1844 and '45. The most serious injuries having been at that time repaired, the effect has since been silent and gradual rather than violent, so that the west pier-head, perhaps, shows the greatest injury. Here the timbers are broken up and the stones washed out quite to the base of the beacon-light, which is in danger of being immediately overthrown. It is contemplated by the superintend­ent of light houses either to repair the foundation or remove the beacon a point on the pier nearer the shore. Aside from saving the pier-head, the former is the best course, as there is no security, if the pier-head is carried away, when the destruction will cease. There being no funds applicable to that object under my control, I could only suggest the proper remedy. Other parts of the piers remain in nearly the same condition as at the close of operations in 1845. Here and there an upper timber loosed from its hold, or a few stones washed out, are the only injuries except those arising from the gradual progress of decay. For these repairs $1,000 will be required.

The estimates in detail, contained in the report of the Topographical Bu­reau for 1845, having been carefully prepared and revised, are adopted as the basis of the present.

Estimates for the completion of the work.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>For rebuilding west pier-head in timber and stone</td>
<td>$4,813.17</td>
</tr>
<tr>
<td>Rebuilding west pier in timber and stone</td>
<td>9,304.29</td>
</tr>
<tr>
<td>Rebuilding east pier</td>
<td>7,948.05</td>
</tr>
<tr>
<td>Rebuilding pier-head in masonry (less the cost of materials on hand)</td>
<td>12,311.41</td>
</tr>
<tr>
<td>For a light-house</td>
<td>6,000.00</td>
</tr>
<tr>
<td>Superintendence, three years</td>
<td>4,500.00</td>
</tr>
<tr>
<td></td>
<td>44,876.92</td>
</tr>
<tr>
<td>Contingencies, 10 per cent.</td>
<td>4,487.69</td>
</tr>
<tr>
<td></td>
<td>49,364.61</td>
</tr>
</tbody>
</table>

If the rebuilding of the west pier-head in masonry is commenced at once, the necessity for the first item will be done away, and its amount may be deducted from the amount required to complete the harbor. Of the above amount, $28,572 will be required for the ensuing year.

Value of its commerce in 1848.

For the following statement, relating to the commerce of this port, I am indebted to the collector of the port for the year 1848:
Doc. No. 5.

Imports.

Value of foreign goods imported

Exports.

Foreign goods exported
Domestic exports

Value of foreign trade

Tonnage.

Number of vessels entered from foreign countries, 211; tonnage of the same, 38,369 tons.

No account of the domestic or coastwise trade seems to have been kept at the collector’s office in this district, and I have not been able to learn its value.

5.—Oak Orchard Creek.

Oak Orchard creek, valuable as a harbor of refuge, (being midway between the Genesee and Niagara rivers,) has not yet been so far advanced as to be of any immediate benefit. I have no doubt that the piers, when pushed into deep water, will prevent further accumulation on the bar and effect a removal of a large portion of the deposits; but the coarser materials must be taken out by the dredge. At the time of my inspection, there was three and a half feet water on the bar; but its condition is variable, sometimes carried out by the spring freshets and again returned by the waves.

The timber-work first built is beginning to decay; but, as it is within the present shore-line, its preservation is not important. The west pier has lost some of its filling-stone at a point about 225 feet from the northern extremity of the pier, extending thence 65 feet towards the shore. The stone seem to have passed out under the bottom, and have left a space about six feet wide the entire length of the breach. The east pier, near the angle, for 100 feet or more, is quite dilapidated, but it is no longer of much importance to the harbor. As it has become a mere wharf line, it may well be left for private hands to maintain. The work put down in 1844 and 1845 stands well, and shows no signs of injury.

Estimated cost of completion.

By the estimate for 1845, the sum required to complete the piers was

Add to this the cost of two pier-heads
Repairs, new machinery, tools, &c.

Amount of estimate

In addition to this we must anticipate the cost of dredging the coarser materials, which will not yield to the force of the current when the pier
shall have been completed. No estimate is submitted, as the quantity cannot be known until the current has had time to operate: it may be safely said, however, that it cannot exceed $10,000.

In order that the work already done at this point may not be lost, but the harbor be brought into immediate use as a port of refuge, I would respectfully recommend that the whole amount required for completing this work be appropriated for the service of the ensuing year. In this way we shall have the full benefit of the flood operating on the bar, which will thus be attacked at the best advantage.

In a commercial point of view, the influence of this harbor is limited by the proximity of the Erie canal. Although situated in one of the finest agricultural regions of western New York, it must always divide the trade in agricultural products, &c. with the canal.

Value of its commerce in 1848.

For the reasons above mentioned, and from the danger and difficulty attending shipments by the lake at this point, the commerce of the port is inconsiderable. Being in the collection district of Niagara, its returns are all merged in the transactions of that district, and I have consequently resorted to private but reliable authority for their quantity and value for the year 1848.

Imports, 1848.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumber, 336,000 feet</td>
<td>-</td>
<td>(foreign) $3,360 00</td>
</tr>
<tr>
<td>Shingles, 700 M.</td>
<td>-</td>
<td>do. 1,400 00</td>
</tr>
<tr>
<td>Merchandise</td>
<td>-</td>
<td>(domestic) 4,000 00</td>
</tr>
<tr>
<td>Salt</td>
<td>-</td>
<td>do. 275 00</td>
</tr>
</tbody>
</table>

Value of imports 9,635 00

Exports, 1848.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>42,000 bushels wheat</td>
<td>-</td>
<td>$42,000 00</td>
</tr>
</tbody>
</table>

For the following statement of the transactions of the district of Niagara I am indebted to G. W. Bowen, esq., deputy collector at Lewiston:

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports during the year 1848</td>
<td>$514,753 00</td>
</tr>
<tr>
<td>Exports, domestic</td>
<td>$159,638 00</td>
</tr>
<tr>
<td>Exports, foreign</td>
<td>$62,145 00</td>
</tr>
</tbody>
</table>

221,783 00

736,536 00
Enrolled tonnage.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Tons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 schooners</td>
<td>63444</td>
</tr>
<tr>
<td>1 steamer</td>
<td>9844</td>
</tr>
<tr>
<td></td>
<td>73244</td>
</tr>
</tbody>
</table>

Entries from foreign ports          | 578    |
Entries coastwise                    | 175    |
Total entered                       | 753    |
Clearances to foreign ports         | 578    |
Clearances coastwise                | 175    |
Total cleared                       | 753    |

I applied to the collector of customs at Sackett's Harbor (in order to exhibit the trade of Lake Ontario) for a similar statement, but am referred to the books of the Treasury Department. I cannot, therefore, make this complete.

Appended to this report will be found a printed slip from the "Commercial Times," containing a statement of "marine disasters and losses on the lakes during the year 1848," carefully prepared by Captain Rounds, an active and intelligent agent of the Northwestern Insurance Company. By this it will be seen that the total loss of property during one year is not less than $420,512; number of lives lost, 55.

I also transmitted a similar statement for the year 1847, under date of March 18, 1848, to which I beg leave to refer.

These sad records are the best evidence of the necessity for providing and maintaining harbors on the great lakes.

I am, sir, with great respect, your obedient servant,

J. W. JUDSON,
United States Agent, Lake Ontario.

Col. J. J. ABERT,
Corps Topographical Engineers.

APPENDIX H.

Office Western River Improvements,
Louisville, September 1, 1849.

Sir: I now have the honor to forward my seventh annual report on the improvement of the western rivers, and on other duties committed to my charge by orders from the Topographical Bureau, for the fiscal year commencing on the 1st July, 1848, and ending on the 30th June, 1849.

In the performance of the various duties assigned me in that year, I have been assisted by Joshua Barney, esq., civil engineer, who has been
employed for the most part on surveys and delineations explanatory of the position, manner of construction, &c., deemed most appropriate for a new canal at the falls of the Ohio, on the Indiana side of the river, near this city; and by C. A. Fuller, esq., civil engineer, who has served as clerk and assistant, in transacting the complicated duties of my station.

The services performed and the disbursements made under my direction during the year above mentioned will be arranged and briefly explained under a series of separate heads in the order and manner following, to wit:

1. **Improvement of the western rivers.**

No appropriation for this branch of the public service having been made by Congress since the date of my last annual report, the services contemplated under this head relate almost exclusively to the custody, disposition, and safe-keeping of the snag-boat Hercules and other public property pertaining thereto, to the surveys and delineations required on account of the canal above mentioned, and to a re-survey and drawings explanatory of the condition of the Cumberland dam and of the river bed of the Ohio at and near that work.

The receipts and expenditures of public funds under this head are as follows:

Unexpended balance on hand and applicable to this branch of the service on the 1st of July, 1848, or beginning of last fiscal year - $4,947 85

Amount of receipts on account of sales of public property pertaining to this service within the same fiscal year 7,530 00

Amount of receipts - 12,577 85

Amount of expenditures for third quarter of 1848 - $1,126 98

Amount of expenditures for fourth quarter of 1848 - 1,002 31

Amount of expenditures for first quarter of 1849 - 875 02

Amount of expenditures for second quarter of 1849 - 861 15

Amount of expenditures - 3,865 46

Balance unexpended July 1, 1849 - 8,712 39

With respect to the progress made in the drawings, estimates, &c., for the contemplated new canal at the falls of the Ohio, the great variety of elaborate delineations required in explanation of the former and the complicated details to be embraced in the latter, added to repeated attacks of illness to which J. Barney, esq., my assistant, who has been almost exclusively employed on the duties here alluded to, have rendered a full and sufficiently complete report on the plan and details of this work entirely impracticable at this time. The drawings, &c., are still in progress, and will be completed and forwarded to the Topographical Bureau, as soon as practicable, with a suitable memoir accompanying the same.
In the mean time, I beg leave to refer to my reports heretofore made in relation to this subject, and especially to the report and sketches forwarded to the bureau under date of May 6, 1848, in which is exhibited an expression of my views and opinions, in general terms, concerning the nature and manner of the improvements which I deem most appropriate and advisable at this place.

Various other duties relating to the improvement of the western rivers have claimed and received all due attention. Of these, the following are a brief summary, viz:

The survey of the Ohio river at and near the site of the Cumberland dam.

The object of this survey was to ascertain the present condition of that work and the nature and extent of the improvements required thereat, in order to subserve the purposes for which it was originally intended. The survey was made under favorable circumstances—the stage of the river being unusually low at the time. My report of December 20, 1848, and the drawings accompanying it, will exhibit my views in regard to the nature of the improvements required at this place and the probable cost of the same, as exhibited in the estimate subjoined to the report.

The custody and safekeeping of the snag-boat Hercules and of the public property pertaining thereto.

The boat, &c., were safely moored in a commodious harbor a little below New Albany, but will require re caulking and other repairs when recalled into service.

Sales, &c., of public property unfit for future service.

The boilers of the Samson and Sevier, together with sundry water and steam pipes and other castings pertaining to the same, were sold early in June last, in conformity to instructions from the Topographical Bureau. The proceeds of these sales have been duly accounted for in my accounts for the second and third quarters of the current year.

2. Improvement of the harbor of St. Louis.

Nothing has been done in the prosecution of this improvement since the date of my last annual report. The sum then reported as remaining in my possession and applicable to this service, viz: $740 80, still remains unexpended, and is hereafter to be accounted for.

3. Construction, &c., of the steam dredge-boat Lavaca.

Agreeably to instructions from the Topographical Bureau, this boat has remained in my charge, subject to orders from the quartermaster's department, ever since the month of January last; but, as yet, no order for the removal of the boat has been received from that department.

The receipts and expenditures incurred on account of this boat within the last fiscal year are as follows, viz:

Unexpended balance on hand and applicable on account of said dredge-boat on the 1st day of July, 1848 - $3,738 99

The expenditures on account of the same for the year ending June 30, 1849, are as follows:

Amount expended for third quarter of 1848 - $96 58
Amount expended for fourth quarter of 1848 - 199 57
Amount expended for first quarter of 1849  $90 00
Amount expended for second quarter of 1849  96 50

Amount of disbursements for the year  $452 95

Balance unexpended July 1, 1849  3,256 04


The superintendence of this work was committed to my charge by the late honorable Secretary of the Treasury, under date of May 31, 1845.

The appropriation for this work prior to the date just mentioned, was $8,333 33, the expenditure of which, with the exception of a small balance, has been duly accounted for in former reports and communications. The balance alluded to on the first day of July, 1848, was $218 29.

The receipts and expenditures under this head for the last fiscal year, the balance above mentioned being included, were as follows, viz:

Unexpended balance as above, July 1, 1848  $218 29
Treasury draft No. 2983, on treasury warrant No. 8510, received April 13, 1849, payable to order of Lieutenant Col. S. H. Long  2,000 00
Treasury draft No. 3345, on treasury warrant No. 9113, received May 16, 1849, payable as above  2,000 00

Amount of receipts  4,218 29
Amount expended for third quarter of 1848  $27 00
Amount expended for fourth quarter of 1848  50 00
Amount expended for first quarter of 1849  127 50
Amount expended for second quarter of 1849  2,735 39

Balance unexpended July 1, 1849  1,278 40

With respect to the progress made in the construction of the Louisville hospital within the last year, it embraces the following arrangements and operations, viz:

The revision and correction of the plans of construction for the purpose of rendering them appropriate and symmetrical in all their corresponding parts; the preparation of plans and drawings complete, explanatory of all parts of the building; the adjustment of the foundations of the building for the insertion of hot-air furnaces and flues, and for the reception of other parts of the superstructure; arrangements for the supply of seven hundred thousand bricks for the superstructure, pavements, &c. of the hospital, and for laying the same in connexion with the building; the procuring of lumber and other materials for the door-frames, window-frames, doors, windows, cornices, casings, &c., &c., for all parts of the building; the building of workshops, &c., in which to prepare the various items of carpentry required for the hospital; the purchase of roofing tin, copper, &c., for the roof of the hospital; the framing and setting of the flooring.
joists and timbers of the basement floors; the preparation of all door and window frames; and the commencement of the mason work of the building; all of which were commenced and in progress prior to the close of the year, and are at this time in such a state of forwardness as to insure a timely completion of the work.

The expenditures reported as above, under this head, were made in defraying the expenses in part of the operations, &c., rested among the details just exhibited.

5. Construction of United States Marine Hospital at Paducah.

The construction of the several hospitals at Paducah, Kentucky, Natchez, Mississippi, and Napoleon, Arkansas, was confided to my superintendence and direction by instructions from the Topographical Bureau, dated October 30, 1848, and January 20, 1849, and has occupied much of my attention from that to the present date.

Full and complete drawings of these several hospitals in plan, elevation, profile and section have been duly prepared and submitted. The arrangements entered into for their construction will be exhibited in the order just before observed, beginning with the hospital mentioned under the present head.

The receipts and expenditures on account of the hospital at Paducah, within the last fiscal year, are as follows, viz:

| Treasury draft No. 1884, on treasury warrant No. 6773, received January 15, 1849, payable to order of Lieut. Col. S. H. Long, for $1,000, one-half whereof is chargeable on account of said hospital, viz: | $500 00 |
| Treasury draft No. 3011, on treasury warrant No. 8542, received April 14, 1849, for $9,000, payable as above, one-third whereof is chargeable on account of this hospital, viz: | 3,000 00 |
| Treasury draft No. 9351, on treasury warrant No. 9143, received May 17, 1849, for $6,000, payable as above, one-half chargeable on account of this hospital, viz: | 3,000 00 |

Amount of receipts - 6,500 00
Amount expended for first quarter, 1849 - $169 40
Amount expended for second quarter, 1849, 174 93

Amount of expenditures - 344 33
Balance unexpended July 1, 1849 - 6,155 67

The arrangements made on account of this hospital embrace the preparation of the requisite drawings; the construction of a fence surrounding the hospital lot; the demarcation of the site of the building, &c.; the excavations for the cellar, foundations, &c., all now in progress; the preparation and delivery of one million bricks, and for all the cut-stone work required for the building, all of which are now in progress; the procuring and delivery of all the lumber required therefor; the execution of all the masonry required for the foundations and superstructure; the preparation and de-
livery of all the window and door frames, casings, &c., doors, window, inclusive of glazing, shutter-blinds, &c., and the employment of supervisors, carpenters, &c., to direct and execute the work, &c., &c. These several operations were commenced within the year, and are still going on with all practicable despatch.

The expenditures on account of this hospital for the current quarter are expected to exceed very considerably the amount hitherto estimated and required, and now applicable to its construction.

Written agreements for various items of the work above designated have recently been concluded, and will be forwarded in due time as accompaniments of my accounts, covering the cost of the items alluded to.

6. Construction of United States Marine Hospital at Natchez.

The measures adopted in reference to the construction of this hospital, and the progress made toward their accomplishment, are similar in all respects to those detailed under the preceding head.

The receipts and expenditures on account of the hospital at Natchez, within the last fiscal year, are as follows, viz:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury draft No. 1884 on treasury warrant No. 6773 for $1,000, received January 15, 1849, payable to order of Lieutenant Colonel S. H. Long—one half chargeable on account of this hospital</td>
<td>$500 00</td>
</tr>
<tr>
<td>Treasury draft No. 3011 on treasury warrant No. 8542 for $9,000, received April 14, 1849, payable as above—one-third chargeable on account of this hospital</td>
<td>3,000 00</td>
</tr>
<tr>
<td>Treasury draft No. 9351 on treasury warrant No. 9143 for $6,000, received May 17, 1849, payable as above—one-half chargeable on account of this hospital</td>
<td>3,000 00</td>
</tr>
</tbody>
</table>

| Total Receipts                                                                 | $6,500 00    |
| Total Expenditures                                                           | $1,548 13    |
| Balance Unexpended July 1, 1849                                              | 4,951 87     |

7. Of the proposed hospital at Napoleon, Arkansas.

On my examination of the site selected for this work in the month of March last, at which time the Mississippi was unusually high, the water overflowing its banks in numerous places, sundry objections to its eligibility as a site for the hospital struck me very forcibly, and I regarded it as my duty to submit my views in relation thereto to the authorities at Washington prior to the adoption of any expensive measures for the prosecution of the work. The objections alluded to are contained in a report I had the honor to forward to the Topographical Bureau under date of March
30, 1849, to which I beg leave to refer for an expression of my opinions
relating to this subject.

In answer to the representations made in that report, all operations in
furtherance of the construction of the hospital were required to be sus­
pended till Congress should reassemble and have opportunity to recon­
sider the decision previously made by them in reference to the occupancy
of this position as a site for the hospital.

Subsequently to the date of the report referred to, I made arrangements
for a careful examination of Napoleon and the country in its vicinity, and
employed a competent engineer for this purpose. The report made by him
and the topographical sketch accompanying the same are strongly con­
firmatory of the opinions previously entertained and communicated by
myself.

A reduced drawing from the sketch above mentioned is herewith trans­
mitted, and will exhibit with clearness the geographical features of the
country, embracing the confluence of the Arkansas and Mississippi, to­
gether with considerable portions of both these rivers and of the grounds
adjacent to them.

From the representations made as above, it appears that a neck or gorge
of ground 1,300 yards in width intervenes between the Mississippi and
Arkansas, at the distance of about fifteen miles above Napoleon on the
former, and about one mile above the same point on the latter river.
The width of this neck of land is constantly diminishing by the abrasions
of the Mississippi on one side and by those of the Arkansas on the other
side of the gorge. From the date at which the public surveys in this
neighborhood were made to the present time the width of the gorge has
been reduced from about one and a quarter mile to the present width, as
above stated, (viz: 1,300 yards;) thus obviously showing a tendency in
both rivers to form a junction at this place.

From the same representations it also appears that another similar
gorge, of only 610 yards in width, occurs between the same rivers at the
distance of about three miles above their confluence on the Arkansas and
two miles below the same point on the Mississippi. At the extremities of
this gorge, also, the abrasions of the two rivers are even more alarming
than at the other gorge; the width of the former having been already re­
duced from about two thirds to less than one third of a mile within the
period above mentioned.

The annual abrasions at each of the gorges are computed at a minimum
of 100 feet per year, so that a junction at the gorge first mentioned may be
expected to take place about forty years hence, or, at the shorter gorge in
less than half that time, on the supposition that the causes now operating
will continue to operate in the same manner during the periods just men­
tioned.

The country to the distance of some twenty to thirty miles westward
from this part of the Mississippi consists almost entirely of alluvial grounds,
for the most part densely wooded, and occasionally presenting lagoons,
pools, and other depressions below the common surface level, which last
nowhere rises beyond the reach of the highest floods of the two rivers.
The flood of 1844 is said to have attained an elevation sufficient to inun­
date this entire region. The last vernal freshet, which was lower by about
four inches than the flood just mentioned, is represented as having over­
flowed this entire district.

Under such circumstances, I cannot but regard the site selected for this
hospital as objectionable, not only on account of the overflows to which it is exposed, and the deleterious effects occasioned thereby, but on account of the tendencies of the Mississippi and Arkansas to form a new junction more or less remote from Napoleon; among the consequences of which an effectual seclusion of the site in question from all the benefits and conveniences of commerce and intercourse with other parts of the western country must be anticipated.

In my report of March, before cited, I took the liberty to suggest the propriety of substituting Helena, within the State of Arkansas, about ninety miles above Napoleon, as far more eligible in many if not in all respects for the contemplated hospital, than any other position that can be found near the margin of the Mississippi within the limits of that State. This is, in fact, the only point on the westerly side of the Mississippi, from the mouth of the Ohio to the gulf of Mexico, at which the highland borders of the Mississippi valley present themselves at the margin of the river. Since the date of my report I have learnt that a suitable site may there be had for this purpose on terms quite moderate and favorable in all respects.

The receipts and expenditures incurred within the last fiscal year, on account of the hospital at Napoleon, relate almost exclusively to the preparation of drawings, and to examinations and surveys deemed necessary as preliminaries to the commencement of the work, and are as follows, viz: Treasury draft No. 3011 on treasury warrant No. 8542, for $9,000, received April 14, 1849, payable to order of Lieutenant Colonel S. H. Long, one third of which is chargeable on account of this hospital, viz:

| Amount expended for 1st quarter of 1849 | $195 70 |
| Amount of expenditures | 491 54 |
| Balance unexpended July 1, 1849 | 2,508 46 |

The duties likely to occupy my attention and that of my assistants during the current year, are similar to, or rather in continuation of those performed in the last year, as briefly explained in the foregoing details. To these may be added, in the event of new appropriations expected to be made by the next Congress, the construction and outfit of suitable boats for the prosecution of the snag business in the western rivers; the enlargement of the Cumberland dam, and other improvements at that place; the improvement of the navigation at the falls of the Ohio, by repairing the old canal, or constructing a new one, &c. &c. &c.

The public funds hitherto drawn from the treasury, on account of the several works herein considered, and remaining applicable to the prosecution of the same, from and after the 1st of July, 1849, are briefly as follows, viz:

| Balance on hand from appropriations for western river improvements | $8,712 39 |
| Balance on hand from appropriations for improvement of the harbor of St. Louis | 740 80 |
| Balance on hand from appropriations for Mexican hostilities | 3,256 04 |
| Balance on hand from appropriations for the United States marine hospital at Louisville | 1,278 40 |
Balance on hand from appropriations for the United States marine hospital at Paducah $6,155.67
Balance on hand from appropriations for the United States marine hospital at Natchez 4,951.87
Balance on hand from appropriations for the United States marine hospital at Napoleon 2,508.46

Amount of unexpended balances on hand July 1, 1849 27,603.63

A considerable portion of this amount has already been applied to the liquidation of demands on account of supplies of various kinds furnished for the hospitals within the current quarter.

I take leave to present, in this place, a statement of the several unexpended balances of appropriations made by Congress for the construction of the marine hospitals above mentioned; which balances remained for use on the date last mentioned, or at the beginning of the current fiscal year; the amount of appropriations for each hospital being $30,000.

Unexpended balance for Louisville hospital $18,945.07
Unexpended balance for Paducah hospital 29,655.67
Unexpended balance for Natchez hospital 28,451.87
Unexpended balance for Napoleon hospital 29,508.46

Amount of unexpended balances July 1, 1849 106,561.07

It is believed that the appropriations above considered (amounting to $30,000 for each hospital) will be sufficient to cover the cost of constructing the same on the plans adopted; while, at the same time, it should be observed that the completion of these several structures is not likely to be accomplished within the current fiscal year.

Summary estimate of funds required for the improvement of the western rivers for the fiscal year beginning July 1, 1850, and ending June 30, 1851:

For the construction and outfit of two new snag-boats, of the largest class, at $25,000 each $50,000.00
For the construction and outfit of three light-draught snag-boats, at $15,000 each 45,000.00
For the construction and outfit of two machine boats, at $2,250 each 4,500.00
For repairs and re-outfit of snag-boat Hercules 2,000.00
For working three large snag-boats, at $25,000 each 75,000.00
For working three light-draught snag boats, at $15,000 each 45,000.00
For working two machine boats, at $7,000 each 14,000.00
For repairs and improvements at the Cumberland dam 50,000.00
For contingencies of all sorts—say 14,500.00

Amount of appropriations required 300,000.00

Respectfully submitted,

S. H. LONG,
Lieut. Col. Top. Eng's, Supt. Western River Improvements.

Col. J. J. Abert,
Chief Topographical Engineers, Washington, D. C.
SIR: I beg leave to present, for the information of the bureau, the following report of the progress made in this work during the year ending the 30th ultimo:

The season of 1848, it will be remembered, closed with inserting into the shoal and bracing the screw piles forming the foundation of this lighthouse. The operations were thus limited by direction of the bureau, which, suspending for the time a decision on a recommendation for an ice harbor for the protection of the principal structure, desired to ascertain, before these piles should receive the superstructure, whether they were capable of themselves of resisting the running ice of a winter. It was with no distrust of their entire ability to do so that the recommendation for an ice harbor was made in the first instance, or twice subsequently renewed, but solely from an apprehension that a work of the character of the one proposed, exposed to be swept by large fields of running ice, would be liable, by jar of the piles, or by torsion of the general figure they form, or by both, to have the glass of the lantern and of the lenticular apparatus fractured and destroyed. The opportunity afforded by presenting an estimate to complete the light-house, was the last occasion this proposition was urged, when, as before, it was accompanied by an estimate to carry out the design. The aggregate of the two estimates, deducting the balance unexpended of the former appropriation, was $29,802 61; which amount, being laid before Congress at the last session, was appropriated, but made available only after the commencement of the new fiscal year, the 1st of July. To stay all further proceedings until that time would be in effect, as the preliminary measures would consume what remained after that date of the working season, at so exposed a locality, to throw the operations into the next year. The design of a permanent light on the Brandywine, already long delayed by causes beyond the control, it should be understood, at the bureau, would thus be still further postponed. To avoid this, it was determined to resume operations at once, by applying the balance in hand to pressing current expenses, and allowing the cost of materials and other heavy items to fall within the coming fiscal year, and thus to urge, if possible, the work through to completion by the close of the season. The bureau is aware that this desire was disappointed. The delays inseparable from so novel a work rendered it very evident, by the time the season suitable for operations in this bay was half spent, that it could not be realized.

The construction of the ice harbor for the protection of the light first engaged attention on resuming operations at the shoal in the spring, and was completed in good season.

The measure next in order was to raise the superstructure piles, including the dwelling, watch room, lantern, &c. To avoid vexatious delays at the site of the work, it was deemed prudent to erect this part of the structure, in the first instance, at the foundry. The chipping necessary in fitting so intractable a material consumed more time than was anticipated for carrying out this intention. By the delay from this cause, the superstructure was not in readiness when the operations at the shoal had so far advanced as to admit of raising it; neither was the work in such a state of
forwardness as to hold out the hope that it could be completed and then
taken down and re-erected in position before the winter set in. The alter­
native, under this state of things, was plainly to close at once all further
proceedings at the shoal, and to confine measures for the present to pre­
paring the superstructure for raising at the site on the opening of the next
season. The operations at the shoal were thus confined to the construc­
tion of the ice harbor.

As in the case of the foundation screw piles, it was necessary, as a pre­
liminary measure, to construct a platform to insert those of the ice harbor
into the shoal. This platform was 70 feet square, resting on 32 ordinary
wooden piles, and elevated 18 inches above highest storm tides. From the
circumstance, principally, that a footing on the shoal was afforded by the
foundation screw piles, the construction consumed much less time than was
required on the first occasion. The sand of the shoal, as before, sensibly
wasted as the work advanced. The maximum, however, of the waste, from
the circumstance that fewer piles were used, and these were spread over a
larger surface, was not as large as in the former instance. The bureau has
already been apprized, through the usual monthly reports, that the sand
that passed away under the influence of the platform of the first season,
had, as we supposed would be the case, nearly, if not wholly, returned,
as shown by observations made in the opening of the present season. It
is not equally certain that the waste that has now occurred will, because
of the presence of so large a number of the screw piles themselves, return
in an equal proportion; and it may be found necessary to fill up with
stone, at least a part of the space that has been cupped out of the shoal.
For this purpose, quarry spalls would be quite sufficient.

The ice harbor consists of thirty screw piles arranged in a hexagonal
pier-like form. It is 75 feet by 45 feet, the greater dimension lying in the
direction of the currents. The shafts are 23 feet 2 inches long, and 5
inches in diameter, squared at one end for a foot to receive the screws,
which, though less in weight, are of the same diameter and general form
as those of the principal structure. The ties are connected together by
two series of horizontal or spider-web braces; one just below their heads,
and the other near low water, in such a manner that the impact or any
one pile is transmitted to and resisted by all the other piles. These braces
consist of two lengths of 3-inch and 2 1/2-inch round iron, and are in­
serted in cast-iron collars secured to the piles. The ice harbor piles are
screwed into the shoal, two feet eight inches less than the foundation
piles, and their heads stand one foot below the highest storm tides. The
foundation piles rise out of the centre of the ice harbor piles, the figures of
the octagon of the former and the hexagon of the latter being concentric.

The superstructure piles, including the keeper’s dwelling, of two
stories, the watch-room, and lantern, have been raised and now stand
erected in the foundry yard. The iron work is completed, with the ex­
ceptions, mainly, of the step from the landing formed by the ice harbor to
the lower story of the dwelling; the stairs thence to the second story; the
steps from this story to the watch-room; the water and oil tanks; the
hand-railings of the galleries of the lower story and of the watch room,
and the foot railing of the gallery of the lantern. These will be prepared
before the opening of the ensuing season. It is likewise the intention to
prepare, as far as possible, all wood-work required for the structure. The
casings for the doors and windows, and the doors, shutters, sashes, &c.
for the same, are now in hand, and will be completed and fitted in place before the cold weather sets in. The accompanying Talbotype will convey a better idea of the character of the superstructure than any lengthened description. The first represents the work in progress of erection; the last as it at present appears. The only change from the latter, when the work has its final position, will arise from dropping the gallery surrounding the lantern about six inches—an operation that can only be done with exactness on raising the superstructure piles on the foundation piles, which stand at unequal heights, varying from part of an inch to five inches.

It has not been thought necessary heretofore to do more than to keep the bureau informed from time to time of the general features of the works and of the progress of the operations, reserving until their completion a full report at a future day. This report it is proposed to accompany not only by drawings in detail of the light-house, ice harbor, and of the machinery and other appliances employed in the operations, but also by such abstracts from the journals as will show the expedients employed, both those that failed as well as those that were successful, in the various steps in carrying out the design, as useful references in future similar undertakings.

The bureau is aware that the estimate already referred to is predicated on the entire work being completed in a single season, and that the accompanying letter states, that in case the operations spread over two seasons, the additional sum of $15,421 87 would be required. By untoward events, as before remarked, the contingency thus provided for has arisen. It is believed, however, that as the operations of the past season were of shorter duration than was estimated for, and the expense both of a second reconstruction of the platform, and of maintaining the vessel heretofore occupied as quarters at the shoal, may be dispensed with by a lodgment at once on the ice harbor, which can be fitted up at little cost as a residence for the workmen, the balance yet remaining on hand may suffice to complete the work. Nevertheless, as the operations are exposed to delays and losses from causes which no ordinary precautions can always guard against, it would be advisable to ask for a small additional appropriation, say $3,000, to meet such occasions. Should these not occur, the amount, if not returned to the treasury, may be applied with advantage in providing a fog-bell, and the requisite oil and water tanks, boats, &c., without which such an establishment cannot be considered complete. Besides, it may be deemed most prudent, if not indeed absolutely necessary for the safety of the works, to compensate by a deposit of stone for any permanent waste which the shoal, from causes already suggested, is likely to suffer. It may likewise become evident on setting up the superstructure, that from the elasticity of the material, one or more series of tension braces will be required, to give the pyramidal frustum forming the figure of the structure a proper degree of rigidity.

The present is a suitable occasion to invite attention to the bearing of the act of the last session, "requiring all moneys receivable from customs, and from all other sources, to be paid immediately into the treasury," &c., upon appropriations for works of construction. Heretofore the practice, with a single exception only, so far as the bureau is concerned, has been to carry the proceeds derived from any particular work to the funds under the head of the same work. But now, under the comprehensive expres
sion "all other sources," the proceeds even of sales of refuse materials must pass to the credit of the treasury, to be used only after re-appropriation.

It may be doubted whether the framers contemplated such an application of the law. The effect of it in all cases of public works wherein materials and machinery are employed, will be to raise the apparent expenditure above the real cost, and insomuch do injustice to the individual in charge. This remark applies with peculiar force to the case of the present work, the original design for which was abandoned by the failure of Congress to provide the means to carry it out; leaving on hand a considerable quantity of materials inapplicable to the plan now in course of execution.

I have the honor to be, sir, very respectfully, your obedient servant,

HARTMAN BACHE,
Major Top. Engineers, Brevet Major.

APPENDIX K.

MACKINAC, September 10, 1849.

Sir: Having occasion to proceed to the eastward for funds for carrying on the survey, I will be unable to forward the usual details connected with my annual report and estimate before my return. We will lose nothing, however, by this delay, because, at the present stage of our operations, and in the present condition of the work, I could not give to the department as satisfactory a view of what will have been accomplished the present season, as I may some days hence, when we will be necessarily bringing the field-work of the season to a close. Moreover, that time will not, as I presume to hope, be too late for the purposes for which the department will desire to use the report.

My parties, some of whom I preceded, arrived here towards the latter part of May; and as soon thereafter as practicable, we began operations in the field. Lieutenant Scammon, assisted by Messrs. Houghton and Herding, with three topographical and hydrographical parties, encamped upon St. Martin's island, which lies northwardly from Mackinac; and, having established a base line for a system of operations in that quarter upon Isle Bois Brulé, he explored carefully the whole of the part of the lake connected with those islands—at least as far as it was practicable and expedient to do so in open boats. This exploration and survey extended from Port St. Ignace, around by Carp and Pine rivers, towards Cheneaux, and included the selection and careful measurement of a secondary base line, a triangulation of the secondary order, for the purpose of connecting the several parts of his operations independent of the main triangulation which Lieutenant Macomb has the especial charge of, and which will ultimately, of course, embrace the secondary. Lieutenant Scammon's duties also included a survey of the shores of the main land, and of all the islands, a triangulation of a tertiary order, for the position of shoals and points subordinate to the secondary triangulation, and likewise the whole of the soundings within his limits. Having accomplished this, he removed his camp to the Cheneaux, a complicated mass of small islands and channels nearly or altogether unknown to navigators, and lying nearly north of Bois Blanc light-house, towards the northern shore of the lake. Lieuten-
ant Scammon is still operating in that neighborhood, pushing forward his work as fast as circumstances will permit.

Mr. Burgess, assisted by Mr. Potter, with two topographical and hydrographical parties, has been employed upon Bois Blanc and Round islands, tracing the coast line of those islands, and carrying the lines of soundings nearest the shore as far into the lake as was deemed to be safe or expedient in open boats. These soundings were sometimes pushed as far as six miles from the shore by means of two or more series of buoys—the one exterior to the other—their position carefully determined by angles taken at the shore and at the buoys. Mr. Burgess's field-work for the season is now completed, with the exception of some observations that will not require the assistance of many of his people; nearly all of them are, therefore, about to be discharged.

Lieutenant Macomb, in the iron steamer, was occupied in reconnoitring for the position of stations for the main triangulation, in opening lines for the extension of the main or primary triangles, and in erecting stations at their summits. Assisted by Mr. Burgess's parties, he also fixed the position of and surveyed two dangerous shoals, lying near the track of vessels, nearly east of Bois Blanc island. He has been engaged, also, in the preliminary measurement of several of the angles of the principal chain of triangles. Under Mr. Foster, there is at present a party employed in re-opening the base line heretofore selected by Captain Williams on the main land near old Michilimackinac. The system of triangulation for the straits of Mackinac and the neighboring region has been carefully studied; and the one we are enabled to employ bids fair to be very perfect in all the requisite conditions. It owes everything to the zeal and experienced intelligence of Lieutenant Macomb, of the corps. This chain, with the assistance of the two shoals above mentioned, may be very readily extended eastward to Point de Tour, at the entrance of St. Marie river of Lake Huron—an extension I had scarcely hoped for at the beginning of the season, and before we had occupied these shoals.

A small party has likewise been employed in examining and registering the velocity and direction of the currents, the influence of the weather, &c., upon them, and the temperature as well of the lake as of the air, &c., &c. Some magnetic experiments have also been made. An assistant was occupied, also, for a considerable part of the season, in preparing a general chart of Lake Erie from the materials in the possession of this office, and in other office duties.

It will be seen, from this statement, that the force available for the field operations this season was five topographical and hydrographical parties and one geodetic party. It was necessary that these parties should be distributed so as to yield to each other the greatest practicable amount of assistance, whenever either of them should chance to need assistance, and that, too, with the least loss of time to their own special duties. For many reasons it was very desirable to extend, as much as my means would justify this season, the system of general (primary) triangulation, or the field arrangements for it. Within the area contemplated for this work, there are particular localities which, as was rightly believed at the beginning, would be near the sides of the most extensive and most important of our triangles, and on the line of which, as was anticipated, a great deal of timber required to be cut down, and at their summits stations erected. Moreover, near some of these localities were shoals on which it might be necessary occa-
sionally to employ the steamer in aid of the hydrographical operations. This view of the subject will account for the manner in which the parties were distributed on the ground, and will show why the ground was not as compactly occupied as it might have been, but for these circumstances. If I had had two or three times the amount of my present force in the field, it would all have been stationed within the same limits I have here described as being covered by the parties, viz: extending from McGilpin's point as far eastward and northward as practicable. With such a force, I would probably have finished this season all the shore lines, and all that is essential of the hydrography. With the exception of the final measurement of the base line, the geodetic portion would also have been very probably accomplished—assuming, however, the possession of the requisite instruments which I am destitute of; at least, the work in all its parts might have been left at the close of the season in such a condition that none of it would require to be repeated hereafter. Under the actual circumstances of the case, however, the work must be left at the close of the season in a very different condition. Between the inshore soundings near the main land on the north, and the inshore soundings of Bois Blanc island, viz: between the systems of soundings nearest the shore, and likewise to the southward of the inshore soundings on the south side of the same island, there are extensive vacant spaces in the hydrographical part of the survey, which have yet to be filled up hereafter, and on which it will be necessary to employ the steamboat party. These spaces, if it had been practicable, ought to have been sounded this season before the buoys belonging to the inshore system of soundings were taken up. Owing to the shortness of the season, and the paucity of our numbers, this was impossible. Hereafter, therefore, it will be necessary to replace those buoys at much expense, or else to make a very slovenly piece of work of it.

You will now perceive how impossible it would have been, with my means, to have accomplished this season the survey of St. Clair river, which was committed to my charge by your orders of last spring, unless I had neglected the more important work of the survey of the Straits of Mackinac. To me, who had considered well and carefully the extent of the means at my disposal and the objects to which it was applicable, it was quite apparent from the beginning that, to make progress to any useful extent upon the survey of the straits—to complete anything there—it was indispensably requisite that I should direct my whole and undivided means to it; and I had no hesitation in doing so, as I presumed, from the tenor of your order, that the period at which the survey of St. Clair river was to be made was a matter committed to my discretion.

The details of the season's operations will be furnished in a supplemental report, as well as my reasons for asking for an enlarged appropriation for next year. The appropriation for the survey in this region alone ought to be at the least $60,000, of which sum a part, say $10,000, will certainly be required for the purchase of a stock of suitable instruments, of which the work has from the beginning been most lamentably destitute. This latter sum I had not thought of asking for before the receipt of your last letter, because until that time I had been all along under the impression that the $10,000 appropriated at the last session of Congress for the survey of the lakes was held in reserve for this indispensable object, because the subject of instruments had been so often pressed upon
the notice of the department, and especially by myself in my last annual report.

I cannot close this letter without expressing my satisfaction at the manner in which the officers of the corps on duty here, First Lieutenants Macomb and Scammon, have devoted themselves to the work.

Very respectfully, I have the honor to be, sir, your obedient servant.

JAMES KEARNEY,

Lieutenant Colonel Topographical Engineers.

Col. J. J. Abert, Corps Topographical Engineers.

OFFICE OF SURVEY OF THE N. AND N.W. LAKES,

Mackinac, October 31, 1849.

SIR: All the parties that were engaged on the survey having left the field for this season, I have, in fulfilment of the promise contained in my report of the 11th September respecting it, to add the following information, viz:

Abstract of work done by Lieutenant Scammon, and the parties under his command.

1. Number of \( \triangle \) stations built - - - - - 28
2. Number of sounding stations, some of them 15 to 20 feet high on the shore, and one of them 18 feet upon the crest of a shoal - - - - - 86

Whole number of stations erected by the parties - - - 114

3. A base line 5355.635 feet in length, cut for the greater part through thick woods, and carefully measured with rods, for secondary triangulation.
4. Number of observations with theodolite, at \( \triangle \) stations - 675
5. Number of vernier readings - - - - - 2,700
6. Number of miles of shore line measured - - - 72
7. The true meridian was determined at two convenient stations, viz: on the north end of St. Martin's island and on the west side of Isle Marquette; and the declination of the magnetic needle was carefully noted at all the principal points in the shore line.

Hydrography.—Lieutenant Scammon took soundings on 595 lines, measuring about 800 miles by estimate, and his number of soundings was 19,156; to effect which he measured with the sextant 225 angles, for the purpose of fixing the position of buoys. Many of his lines abutted on the shore, and hence the small number of sextant angles compared with the number of lines; the shore stations having been determined by other means.

Observations for latitude were made at the principal station on Isle St. Martin, but it is needless to state that, owing to the insufficiency of instruments, these are of little value.
Abstract of field-work executed by assistant Burgess and his parties, chiefly on Bois Blanc and Round islands, lying eastwardly from Mackinac.

The extent of coast line measured is 40 miles; the angles, with a small Gambey theodolite, graduated to 10° of arc. The instrument occupied 187 points, 23 of which were principal stations in his work, or points of tertiary triangulation. His vernier readings number 1,622. The number of sextant angles for buoys was 285. Buoys located, 80. Soundings, number, 9,939. Number of stations erected by him for his principal and secondary operation, 66. Besides this work, there were several miles of line of sight for the primary triangulation of the survey cut through the woods by his parties. He also assisted Lieutenant Macomb in the survey of the great reef that lies about 22 miles to the eastward of Mackinac.

Aggregate of work done by Lieut. Scammon and Mr. Burgess's parties.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles of coast line surveyed</td>
<td>112</td>
</tr>
<tr>
<td>Number of vernier readings</td>
<td>4,322</td>
</tr>
<tr>
<td>Number of sextant angles</td>
<td>510</td>
</tr>
<tr>
<td>Number of other angles</td>
<td>675</td>
</tr>
<tr>
<td>Number of buoys located</td>
<td>155</td>
</tr>
<tr>
<td>Hydrographical and topographical stations erected</td>
<td>180</td>
</tr>
<tr>
<td>Number of soundings</td>
<td>29,095</td>
</tr>
</tbody>
</table>

The charge of the main triangulation having been assigned by me to Lieutenant Macomb of the corps, he was employed for much of the time he was in the field in the selection of suitable positions for the summits of the triangles, and in erecting stations upon them. Experience has shown the expediency of rendering these stations (which are of timber) as permanent as the nature of the material of which they are constructed would permit, and that, when occupied by the instruments, their stability should be such as to secure them as much as possible from vibration. In several instances also it was necessary that their height should compensate for the deficient elevation of the ground. Most of them were, therefore, of considerable magnitude, and all of them of the same general plan that, in the survey of the west end of Lake Erie, had been found to answer so well the purposes for which they were designed—namely, for stations for the instruments and as signals. Twenty six of those stations were built and left in a state to be occupied in the prosecution of the work of the main triangulation on the opening of the next campaign. They varied in height from 12 to 43 feet above the soil, according to the elevation of the ground and the length of the sides of the triangles to which they respectively belonged. Lieutenant Macomb also surveyed, with the assistance of Mr. Burgess's parties, a very dangerous shoal lying not far from the usual track of vessels. Its precise locality being unknown to navigators, and conflicting accounts being in circulation concerning it, although a very valuable steamer had been damaged on it but two years ago, he was five days in searching for it with the help of a pilot. In this search he stumbled upon the cause of the conflicting accounts to which I have referred—namely, another and heretofore unknown shoal in its neighborhood. These two shoals are about four miles apart and fifteen miles east by south from the east end of Bois Blanc island.
Water stations were erected for the survey of the principal one of these shoals, and on the same plan as those used for the like purpose on Lake Erie. Like those on shore, they were equally adapted to the purpose of station or signal, and as readily convertible into the one or the other, although in their plan of construction the land and the water stations are quite unlike each other. Their position being established by means of the main triangulation, they become the termini of bases for the special purpose of the survey of the shoal and the neighboring waters. During the season they have served here, as they did on Lake Erie, the valuable purpose of beacons. In the present case, the shoals in question will probably enable me to extend the triangulation eastwardly along the northern shore of the lake to Point Détour of St. Mary's river. The other reefs reported dangerous are said to lie within the present field of operations—one of them about six miles northwardly from the great reef I have already mentioned, and on the direct route from Point Détour to Mackinac; another about six miles east, and one the like distance west of the latter place.

The base line which had been cleared and partially measured by my predecessor's directions was re-examined this season. The stone monuments at its extremities were found to be undisturbed and the marks upon them well preserved; all the others marking the line, except one, being still standing. This base is nearly six miles long, and much of it had been covered with heavy timber which was cut down at the period the line was adopted. This long lapse of time has been, in this particular, of advantage to us, as it lightened the labor of preparing the line for being measured, for we found many of the stumps of the trees on the upland much decayed and comparatively easy to be removed. Portions of the line occupied swampy ground, and much of it was bridged during the season under Lieutenant Macomb's supervision. About fifty yards remain to be done. When this is finished, it will leave but a few more days for the completely clearing of the line and putting it in a condition to be measured. The measurement, however, should not be begun before the early part of August, because in June and July we could not reasonably look for accuracy in such an operation, owing to the swarms, the pertinacity, and the venom of the insects of that locality in the early part of summer.

Stations in all respects of the first order were erected during the season over the monuments at the extremities of the base, and they were precisely centered to the old marks on the monuments. Arrangements were also made by Lieutenant Macomb for carrying from the base in three several directions extremely favorable systems of triangles, and for that purpose, with reference to the more westwardly chain in its progress from the north-west end of the base, it was found necessary to give a greater height to that station than had been given in any other case. It was found necessary also to make a cut through the woods for about one-third of a mile for that purpose.

The base line I have been speaking of has been very judiciously selected, and there is reason for believing that none other could be found equal to it within our present field of operations. Your instructions to Captain Williams respecting this survey contemplate the execution of a geodetic operation, and it is in conformity with this purpose, as you will have seen, that the operations of the present season have been conducted; and to this same end a base line of six miles, or
SKETCH
of the Township including
NAPOLEON
and the circumjacent Country.

Drawn from
Records of the Land Office at
HELENA.

Reduced by M.C. Long
Scale
One Mile to an Inch.

Note. The quarter in the Sketch with the
numbers inserted therein represent the
Sections into which the land was divided
by the Surveyor.

Width of Upper Gorge 1300 Yards.
Width of Lower Gorge 650 Yards.

Note. The full lines indicate the positions
of the River-banks at the time of the original
Survey; while the dotted lines near them indi-
cate the present position of the Shores.
thereabout, was suitable and proper. But all these preliminaries infer, necessarily, the employment hereafter of corresponding and suitable instruments for the linear measures and for measures of arc, for the astronomical, the geodetic, the topographical, and the hydrographical portions of the work; whereas, with respect to the first two classes, we are totally and to the latter very nearly destitute of any that are fit to be taken into the field; and to this enumeration of our deficiencies should be added the whole class of instruments subservient to the observation of the physical phenomena that usually and naturally connect themselves with an operation of the kind I am speaking of. A sufficient stock of such instruments could not cost, I presume, less than $10,000—that being about the amount I have estimated from the deficient elements in my possession at present. If the work is to proceed with a view to the objects contemplated by your instructions, we have arrived at the period of the work when the possession of those instruments becomes indispensable to its progress. For this reason it is that my estimate for the ensuing season's operations includes that item.

I may add, unless the higher classes of these instruments are of the first quality, and of a character corresponding with the manifest design of our preliminary operations, that there will have been much waste of time and money in what has been done up to this point in our work; and further, that such instruments as I have reference to are not to be suitably made by mere mechanics, however skilful they may be, unless under the direction of some one acquainted with the theory of the instruments—with the branches of physical science with which they are severally connected, and with the special object and purpose of each, and their practical and peculiar adaptation to the specific objects for which they may each of them be intended.

The other parts of my annual estimate in detail, will, I think, speak for themselves, with perhaps the exception of the hire of a steamer, of which I will say more hereafter. The force contemplated to be employed is the least possible consistently with the concurrent economy and progress of the work, and it is less than I should have recommended if it were not for the difficulty opposed to any very sudden expansion, arising from the difficulty of finding suitable assistants for a work which requires a course of training so peculiar as does an operation of this kind, conducted upon the system you will have observed to prevail in this survey, for you will have remarked that the same parties carry on as well the topographical and the hydrographical, and even other branches of the work, according to the circumstances—an arrangement which may very easily be shown to be much more efficient and economical than one which would place these several classes of duty in separate and distinct hands.

Respecting the employment of a steamer, I have to state that Lieutenant Macomb, the nature of whose occupation has required the use of the “Surveyor,” has been embarrassed this season by reason of the necessity we have sometimes been under of using her for the purpose of communicating with and assisting the other parties in the field. The coming season she cannot well be diverted from the specific duty to which she belongs, viz: that of the main triangulation, &c., without seriously impeding its progress. The topographical and hydrographical parties being more numerous and more widely dispersed at that period, they will occupy more of the time of a despatch boat for purposes of intercommunication and sup-
plies; besides which, some of the ensuing season must be given to the off- 
shore soundings, or those which lie out in the open lake and broad chan- 
nels, and for these the employment of a steamer will be necessary; and by 
adding that service to her other duties, her time may be fully occupied for 
the period stated in the estimate.

In conclusion, I have to say that the quality and quantity of the work 
executed by my assistants during the season are sufficient evidence of their 
zeal and ability, and render anything I could say in commendation of them 
unnecessary.

I am, sir, very respectfully, your obedient servant,

JAMES KEARNEY,
Lieut. Col. Corps of Top. Engineers.

Colonel J. J. ABERT,
Bureau Topographical Engineers.

---

Detailed estimate for the survey of the north and northwest lakes for the 
season 1850.

STRAITS OF MACKINAC.

For the steamer "Surveyor" and Lieutenant Macomb's 
party, at $1,300 per month for four months  -  $5,200 00
For four topographical and hydrographical brigades of three 
parties each, at $1,365 each per month for four months -  21,840 00
Hired steamer and barge crew, at $2,480 per month for three 
months -  7,440 00
Astronomical party, &c., at $300 per month for five months -  1,500 00
 Draughtsman, computer, &c. -  900 00
 Purchase of instruments -  10,600 00
 Per diem of three officers in the field -  465 00
 Steamer "Surveyor" in ordinary, at $140 per month for 
eight months -  1,120 00
 In office three assistants, at $3 00 per day } -  4,800 00
 In office one assistant, at $3 50 per day -  for eight months  4,800 00
 In office three assistants, at $2 50 per day } -  3,000 00
 Transportation of officers -  600 00
 Camp equipage, grapnels, &c. -  500 00
 Office expenses, orderly, &c. -  800 00
 Additional boats, barges, &c. -  1,600 00
 Additional tents -  960 00
 Contingencies—as stationery, office instruments, field sta-
tions, &c., &c. -  2,075 00

Total -  60,000 00

If the topographical survey near St. Clair river is to be undertaken, then 
$7,000 to be added to the above.

JAMES KEARNEY,
Lieutenant Colonel Top. Engineers.
No. 14.

REPORT OF THE COLONEL OF ORDNANCE.

ORDNANCE DEPARTMENT,
Washington, November 1, 1849.

SIR: I have the honor to present the following report of the operations of this department in the discharge of its duties during the past fiscal year. These duties are, in general terms, to provide and furnish all "ordnance and ordnance stores," of every description, required for the troops and for the permanent fortifications and other military posts of the United States, as well as the annual supplies for arming and equipping the whole body of the militia. They include the preparation of estimates for these objects; the direction and supervision of all expenditures therefor, and of all operations at the United States armories, arsenals, and ordnance depots; the care and preservation of all military supplies and other public property at these places; the examination of all requisitions for arms, ammunition, and other "ordnance stores" for the public service; the ordering of proper quantities of them to the different points where wanted, with the transportation and delivery of those furnished to the States and Territories, and the enforcement of a proper accountability, according to regulations, of all property of this description belonging to the United States. As the particular operations of the year can be more conveniently stated and more readily referred to by placing them under their appropriate heads, they will be so arranged in order, as follows:

Funds.

Amount, as per last year's report, undrawn from the treasury on the 1st July, 1848 - - - - - - - - - - - - - - $342,317 36
In hands of disbursing officers, same date - - - - - - 87,391 64
Amount of appropriations for the fiscal year 1849, including the fixed annual appropriation for arming and equipping the militia - - - - - - - - - - 1,202,488 00
Received during the year for sales, rents, damages to arms in hands of troops, and all miscellaneous sources - - - - - - - - - - - - - - - - 261,607 27

$1,893,804 27

Amount of expenditures during the year - - - - - - - - - - - - - - - - $1,186,814 98
Turned into the treasury, being a balance in an officer's hands not required for disbursement - - - - - - - - - - 376 46
In hands of disbursing officers 30th June, 1849 - - - - - - - - - - 196,713 42
Remaining in treasury, undrawn, 30th June, 1849 - - - - - - - - - - 509,899 41

$1,893,804 27
The expenditures during the year from the different appropriations are stated hereafter, under their separate heads as they occur in this report. The amount reported as received from sales, &c., is far greater than has been heretofore derived from these sources. The great increase during the past year is owing to sales, in accordance with the act of March 3, 1845, of unserviceable ordnance stores damaged during the war with Mexico and not worth the cost of repairing, and of flint lock muskets not suitable for alteration to percussion, or for the public service in their present form.

There has been no delinquency among the disbursing officers of this department, in rendering their accounts as required by law and regulations.

Armament of Fortifications.

The operations of the department in this branch of its duties have consisted chiefly in increasing the supply of gun-carriage timber; the fabrication of casemate and barbette carriages, where properly seasoned timber was on hand; the repair and preservation of the armament at the forts, and such additions thereto as were requisite for the instruction of their garrisons in the use of heavy artillery.

Owing to the rapid decay of gun-carriages at forts, where they are necessarily more or less exposed to dampness in casemates, or the effects of the weather when mounted in barbette, and where the frequent withdrawal of garrisons prevents proper attention to their preservation, it is not deemed advisable to place at them more mounted artillery than will serve for drilling the troops and for saluting batteries. It is thought better to keep the carriages and implements at the arsenals, where they can be properly stored and attended to, so as to be ready on any emergency that may call for it, to supply a proper armament in good order for service. To arm the forts fully with mounted artillery would not only occasion loss by rapid decay of the carriages and the expense of frequent repairs, but might lead to serious disasters by causing reliance to be placed on the amount of the armament in position, when its condition might render it useless for service. It is the aim of this department, therefore, to provide and lay up materials for the construction of carriages and other articles required for the armament of fortifications, rather than to finish and put this armament in place.

Among these materials, that of primary importance is carriage timber. With an ample supply of this on hand, in proper condition for working, it would be an easy matter to furnish carriages at short notice in the best order for use. Timber requires at least three years' seasoning before it is fit for use in constructions of this kind, and is much improved by allowing it to remain five years for the purpose. It would be difficult, if not impossible, to procure it on an emergency, of suitable quality and in sufficient quantity.

But few cannon and projectiles for forts have been provided during the year. The limited amount of the appropriation and the more advantageous application of the available means to the procurement of other articles, did not admit of extensive orders to the foundries. A new method of casting iron ordnance, devised by an officer of this department, which promises to render such guns stronger and more durable, is now being tested under the immediate supervision of the inventor, aided by a practical and experienced founder. The result is not yet known; but
should it confirm the very reasonable theory of the inventor in regard to
this mode of casting, it will effect a valuable improvement in iron cannon.
The expenditures during the fiscal year from the appropriation for arma-
ment of fortifications amount to $101,908 26. The principal articles pro-
cured by purchase and fabrication at the arsenals are the following, viz:

81 iron howitzers for flank defence.
1 howitzer casemate carriage.
100 columbiad casemate upper carriages.
52 " " " chassis.
92 32-pounder " "
12 32-pounder barbette carriages, complete.
14 24-pounder barbette carriages, complete.
1 8 inch sea-coast howitzer barbette carriage, complete.
1 " " " upper carriage.
1 casemate truck.
70 10 and 8 inch shells.
37,107 cubic feet of gun-carriage timber.

There have been sent to the forts during the year 17 cannon and 42
carriages.

*Ordinance, Ordinance stores, and supplies.*

The operations performed under this head are the preparation and sup-
ply to the regular troops of siege, field, and mountain artillery, with their
carriages, ammunition wagons, forges, ammunition, implements, and har-
ness; of all accoutrements and side arms, and of rifles and cavalry pistols.
The expenditures from this appropriation, during the year, amount to
$247,302 72. The principal supplies, procured by purchase and fabrica-
tion, are the following, viz:

19 carriages for mountain artillery.
4 sets of harness for mountain artillery.
48 sets of harness, each for four horses.
4,000 hammers for percussion cannon locks.
32 India rubber tarpaulins.
331 shells, of different calibres.
125 spherical case shot, strapped.
500 stands of canister shot.
1,290 rounds of fixed ammunition for field guns.
300 flint-lock muskets (altered to Maynard's percussion plan.)
2,400 percussion rifles.
300 dragoon carbines.
1,500 percussion pistols.
740 Colt's pistols.
2,410 sabres, for cavalry and horse artillery.
1,014 non commissioned officers' and musicians' swords.
1,000 riflemen's knives.
676 cartridge boxes.
5,521 bayonet scabbards with frogs.
2,254 belts (waist and cartridge box.)
500 gun-slings.
2,908 percussion cap pouches.
2,550 sabre belts.
1,361 sabre knots.
120,330 cartridges for small arms.
8,939,000 percussion caps for small arms.
25,141 pounds of lead.
21,490 cubic feet of timber for carriages.

Statement C, hereto annexed, shows the quantities and kinds of arms, ammunition, and other ordnance supplies furnished to the United States troops during the year ended June 30, 1849. During the same time, emigrants to California, Oregon, and New Mexico have been supplied, under the resolution of Congress of 2d March, 1849, with arms and ammunition to the value of $9,344 83.

National Armories.

The expenditures at the national armories, during the fiscal year, have been as follows, viz:

<table>
<thead>
<tr>
<th></th>
<th>Harper's Ferry</th>
<th>Springfield</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the manufacture of arms, appendages, tools, &amp;c., and purchase of materials for the same</td>
<td>$168,184 14</td>
<td>$196,006 87</td>
<td>$354,191 01</td>
</tr>
<tr>
<td>For repairs, improvements, and new machinery, including lands, buildings, dams, &amp;c.</td>
<td>55,674 70</td>
<td>59,820 96</td>
<td>115,495 66</td>
</tr>
<tr>
<td></td>
<td>223,858 84</td>
<td>245,827 83</td>
<td>469,686 67</td>
</tr>
</tbody>
</table>

The manufactures at Harper's Ferry armory for the year include 8,300 percussion muskets and 1,925 percussion rifles, with 45,043 appendages for the same, consisting of extra cones, ball screws, screw-drivers, spring-vices, wipers, and bullet moulds; 276 flint-lock muskets have been altered to percussion, and 46,930 hammers, cones, and screw-drivers, for muskets to be thus altered, have been made.

At Springfield armory there have been manufactured 15,215 percussion muskets and 1,000 cavalry musketeons, with 39,323 appendages for the same, consisting of like parts with those before mentioned.

Considerable additions have been made, at both armories, to the machinery and tools, for facilitating and economising work. But part of the amount expended on this account, and none of that for materials purchased but not used during the year, is properly chargeable to the cost of the arms made in that period. The actual cost of the finished musket, including materials, workmanship, inspection, and supervision, has been $9 87½ at Springfield armory, and $12 72 at Harper’s Ferry. The difference is attributable in great measure, if not entirely, to the greater
amount and better quality of machinery and buildings at the one armory than at the other. Improvements in both respects are being made at Harper's Ferry armory as fast as the means available will admit, and, when completed, there will be no good reason why the reduction in the cost of finished arms may not be as great at this as it has been at the other armory. Since the armories have been under the exclusive management of this department, and superintended by officers of the Ordnance corps, there has been an annual diminution in the cost of manufacture; and figures will bear me out in asserting that the difference of cost of the number of arms made during the last year, and that of the same number and quality under the former system of superintendence, will amount to more than the pay and emoluments of all the officers of the Ordnance corps. At the same time, the rates of wages have been fair; the workmen never receiving less than similar services and skill would command in private employment.

The arms, appendages, components, &c., made, the new machinery provided, buildings erected, and other work done at the armories during the year, are more particularly stated in the reports of principal operations by the commanding officers of these establishments, hereto appended, to which reference is made for more detailed information respecting them. The estimate for the manufacture of arms for the next year, contains the amount usually appropriated for that purpose. That for repairs and improvements includes the amount required for keeping the buildings and other public property in good order, and for pursuing the system of improvements necessary for placing these establishments on the best footing for manufacturing to advantage. The objects to be effected are separately stated, and the reasons for each explained in the estimate.

Arming and equipping the Militia.

From the standing appropriation for this object are defrayed the expenses of procuring and delivering to the States and Territories, on requisition from the proper authority thereof, such arms and equipments of the prescribed patterns as may be due. The quota of each is annually apportioned at this office under the act of 1808, according to the number of militia included in the returns made to the Adjutant General of the army. Some of the States, as will be seen from the statement (A) hereto annexed, have not made returns for many years; and as these returns are the only data from which the supplies for each State can be determined, they continue to receive according to the number of militia last reported, which is probably much less than the actual number would entitle them to. Moreover, the method of arriving at the aggregate militia force is not uniform throughout the States. For these reasons it is obvious that the actual issues do not give, as required by the 3d section of the act of 23d April, 1808, "to each State and Territory, respectively, in proportion to the number of effective militia in each;" nor is it probable, judging from past experience, that sufficient accuracy and regularity in the returns to regulate the issues as therein required can be attained. It is, therefore, suggested as a better method of apportioning the arms and equipments to the several States and Territories, that the annual quota of each be according to population or to representation in Congress. This will, of course, require a change in the existing law.
The amount expended during the year from the appropriation for arming and equipping the militia is $173,709 33. The principal articles obtained on this account by purchase and fabrication at the arsenals are as follows, viz:

- 74 carriages for field-guns.
- 7 caissons.
- 4,840 percussion rifles.
- 1,200 carbines.
- 3,750 percussion pistols.
- 2,430 cavalry sabres.
- 1,000 non commissioned officers’ and musicians’ swords.
- 2,000 sabre belts for cavalry and artillery.
- 1,450 cartridge boxes.
- 500 pairs of holsters.
- 500 slings and swivels.
- 2,000 copper flasks for riflemen.

The apportionment of arms and the issues to the militia during the last year are shown in the annexed statements, A and B.

### Arsenals and depots.

The whole number of arsenals and ordnance depots, including temporary depots, has been during the year twenty-eight. Of these, the depots at Point Isabel and Galveston, Texas, and at Fort Leavenworth, Missouri, established during the Mexican war, have been recently, by your orders, broken up. There are four arsenals of construction, viz: at West Troy, N. Y., Pittsburg, Pa., Washington, D. C., and Old Point Comfort, Va., at which, besides being depositories like other arsenals, the greater part of the ordnance supplies, excepting small arms, are fabricated. The next in importance are the arsenals of deposite and repairs, where arms, ammunition and other ordnance stores are received, taken care of and issued, and where small arms, gun-carriages, implements, &c., are repaired and put in good order. Some of these arsenals are also used for construction on a small scale, when occasion requires. The depots are mainly places for the proper storage and preservation of ordnance and ordnance stores, but are also provided with the means of repairing and cleaning arms, and of preparing ammunition. All arms and other ordnance supplies for the land service not in use by the army are placed at these arsenals and depots, and so distributed among them as it is thought will best secure their safety, and, at the same time be most convenient to meet the wants of the service, so far as they can be foreseen. A careful examination of all articles in store at the armories, arsenals and depots is made annually, and inventories of the same, including lands, buildings, and all public property, are prepared and forwarded to this department. These inventories exhibit each article that has been received at any of the arsenals during the year, and how obtained; each article that has been taken therefrom, and how disposed of; with the condition and number or quantity of each remaining on hand, and its money value. The following aggregates of value in money are exhibited by the inventories for the year ended the 30th of June, 1849:
Lands, magazines, storehouses, quarters, barracks, workshops, and machinery - - - - - - - - $4,536,269 61
Artillery of every description, with carriages, implements, and projectiles - - - - - - - - - - - - - 2,650,468 84
Small arms of every description, with their appendages and accoutrements - - - - - - - - - - - - - - 7,973,236 84
Ammunition of all kinds, including powder and materials for its manufacture - - - - - - - - - - - - 1,110,208 74
Component parts of artillery carriages and equipments, and of small arms and accoutrements - - - - - - - - 336,446 45
Gins, carts, implements, and tools of every description, in use or current service - - - - - - - - - - - - - 344,691 45
Unwrought materials and tools in store - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - 664,790 30

17,616,112 23

At each arsenal is stationed a detachment of enlisted men for guard and police duties, and such mechanical employments as the skill of these men fits them to perform. They are uniformed, armed and equipped, instructed in military exercises, and perform the same duties at the arsenals as garrisons of similar strength do at other posts; when not on duty as soldiers they work in the shops. The average number of enlisted ordnance men in service during the year has been 489; by the latest returns received, (viz: for September,) it was 484. For constructions and fabrications requiring a higher order of mechanical skill, regular artisans are employed by hire at daily wages, their number varying according to the work to be done, and their compensation being fixed on the principle of that paid for similar services and skill in the vicinity of the arsenals where they are employed.

The amount expended from the appropriation for " arsenals" during the year has been $88,854 96. These expenditures have been strictly applied to the execution of the objects specially designated in the estimates on which the appropriation was based. They include repairs and preservation of public buildings, fences, wharves, &c., the erection of new and additions to old buildings, and all improvements of a permanent character. The statements of operations at the principal arsenals, reported by their commanding officers, and hereto appended, are referred to for a more particular account of the work done under this head. The estimate for the next fiscal year is based on special estimates rendered by the commanding officers of the different arsenals. These estimates have been considerably reduced, after examination at this office, and only the most important objects have been included in the general estimate prepared here.

The extension of our territorial limits, by the late acquisition of new countries, calls for the construction of additional permanent arsenals or ordnance depots for the preparation or deposite of military supplies at places convenient to their inhabitants. Four of these should be commenced as soon as proper sites are selected for their location: one in Texas, one in New Mexico, and two on the Pacific coast—in California and in Oregon. I respectfully suggest that application be made to Congress, at its next session, for the proper legislation to authorize the building of these four arsenals, and for an appropriation of $100,000, to be expended under the direction of the War Department, for defraying the expenses of selecting sites,
the purchase of land, if necessary, and to commence the erection of suitable buildings.

During the past year, an officer of the corps was despatched to Europe to obtain information connected with the manufacture of arms and the preparation of military supplies, in which this department is immediately and the country generally interested. His report, giving much valuable information which could have been collected only by close observation by a practical officer, is hereto annexed, and bears indisputable evidence of his zeal and judgment in obtaining a knowledge of the various subjects of inquiry.

G. TALCOTT,
Brevet Brig. Gen., Colonel of Ordnance.

Hon. George W. Crawford,
Secretary of War.

Statement of the principal operations at the armories and arsenals during the year ended June 30, 1849.

SPRINGFIELD ARMORY, COMMANDED BY LT. COL. RIPLEY.

The principal operations at this armory during the year have been as follows:

Arms and appendages fabricated.

15,215 percussion muskets,
  1,000 percussion cavalry musketoons,
  1 percussion Wall rifle, and appendages,
  22 percussion cadets' muskets, "repaired."
22,332 wipers.
16,081 compound screw-drivers.
  910 extra cones.
  38 arm chests.
  13 packing boxes.

Tools.

Additions and improvements have been made to tools in current service.

Machines fabricated and in progress.

2 machines for milling, completed.
  1 do for straightening, completed.
  4 do for stocking, completed.
1 do for drilling and finishing cones, completed.
8 do for drilling, milling, and stocking, and
  1 tilt hammer in progress.

Continued improvements have been made in shop fixtures, or "driving machinery." The main lines and other shafting, pulleys, hangers, &c., at
the upper water shops, have been almost wholly renewed, and, with the machinery, have been re-arranged. The boring machines have been removed from the south to the upper room of the milling shop; and the bayonet machines removed from the milling to the upper room of the south shop; thereby bringing the principal operations performed upon the barrels at these shops contiguous to each other, and saving much time and labor of transportation.

Buildings.

The tower and roof of the new arsenal have been finished; the cellar paved; exterior of the walls oiled, and the building secured by good copper electrical conductors. The lathing and plastering of this building have been completed, amounting to 9,000 superficial yards. The arsenal is now ready for the racks, which are in rapid progress.

The walls of the remaining section, or half, of the new storehouse, have been erected and roofed; ready for slating.

The old brick forges and wood flooring in the welding shop have been removed, and neat cast iron forges and brick pavement substituted; thereby greatly improving the shop in appearance, and rendering it much less hazardous from fire.

11 cast iron forges have been fabricated for this shop; two for the tilt-hammer shop, and four for the annealing room, in the wing of the steam shop.

The flume has been rebuilt for the upper water milling shop.

The six old wooden tenements on the east square have been sold at public auction, and removed.

Grounds.

The grading and embankments have been continued north of the new storehouse and west of the new arsenal. About 80,000 cubic yards of earth have been removed, for filling ravines, and forming embankments north of the new storehouse.

A road has been graded and gravelled from the steam shop, parallel with the filing and finishing shops, to the east arsenal; length 790 feet; width 11½ feet.

A walk has been completed across the south side of the square, parallel with, and north of the arsenals; length 941 feet; width 5 feet.

A large culvert has been completed on the east side of the new arsenal, and parallel with it; also, four smaller culverts; the whole to conduct the water from the new arsenal and adjacent grounds. Total length 2,142 feet.

About 9,000 superficial yards of sodding have been laid around the new arsenal and on the embankments north of the new storehouse.

Sixty rods of high board fence have been built on the southwest corner of the government land, and 38½ rods of picket fence built, and repaired, for enclosing the new arsenal.

HARPER'S FERRY ARMORY, COMMANDED BY MAJOR SYMINGTON.

The transfer of machines and machinery from the old to the new shops, and the necessity for supplying many new machines, and remodelling
such of the old as could be made to answer, in order, by greater facilities, 
to reduce the cost of the arms hereafter, has greatly limited the number 
of arms fabricated during the year.

Within a month or two of the present year, most if not all the facilities 
for prosecuting the fabrication of arms advantageously, will have been com-
pleted. The barrel welding and tilting hammers, and rolling mill for 
working up our scrap iron, have yet to be completed before the best results 
can be obtained.

Arms and appendages fabricated:
8,300 percussion muskets.
45,043 various appendages for percussion musket and rifle. 
1,925 percussion rifles.
278 flint-lock muskets, altered to percussion.
46,930 hammers, cones, and screw-drivers for ditto.

The following machines, &c., are in hand, in various stages of comple-
tion: 
1 machine, 4 spindles, for drilling hammers for muskets, altered from 
flint to percussion.
1 machine for drilling cones.
1 do for cutting trigger blades.
1 do for checkering hammers.
2 machines for turning barrels.

FOR THE RIFLE FACTORY.

1 machine for cutting stocks to length 2d time, fabricated.
1 do for smooth-boring barrels, geared double, do
1 do for swift-boring do single, do
1 do for experimental drilling of cast-steel barrels, do
1 do for draw polishing barrels, do
1 do for rough boring do do
2 do for 2d turning rifle stocks, purchased.
1 do for hand planing, do
30 do for cutting components, altered and improved.
1 do for turning stocks, do do
1 do for spotting stocks, do do
1 do for cutting in lock and mounting, altered and improved.
1 do for slitting screws, do do
1 do for turning flats and ovals of barrels, do do
3 do for cutting in box, breech, tang and breech plate, altered and 
   improved.
2 6-feet turbine water wheels, with cemented stone forebay, put up 
and in operation.
24 feet of pit gearing, 190 feet main line, and 329 feet counter—driv-
ing machinery, with fixtures, &c., complete, put up and in operation.
330 musket barrels, model of 1822.
1.47 ball screws, do
1 percussion rifle lock, complete.
10,310 components, assorted, for percussion muskets and rifles, fabri-
cated, and issued to arsenals.
1 set, complete, of machines and implements for altering flint-lock muskets to percussion.
Machines and Machinery.

FOR THE MUSKET FACTORY.

1 machine for horizontal drilling, fabricated.
1 do for tapping cones, do
1 do for tapping screws, do
1 do for turning tungs of breeches, do
2 do for turning barrels, do
1 do for spotting stocks, altered from old.
1 do for milling ball screws, do do
1 do for banding stocks, do do
1 do for 2d boring bayonets, do do
2 do for drilling, do do
2 do for 2d turning musket stocks, purchased.
1 do for planing iron, do
1 do for large geared drilling, do
83 feet main line, and 253\(\frac{3}{4}\) feet counter driving machinery and fixtures, put up and in operation in new stocking shop.
8\(\frac{1}{4}\) feet counter machinery, driving, &c., put up in machine shop, and
12 feet ditto in boring mill.
1 force pump, with lead, supply, and waste pipes, troughs and reservoirs, for supplying barrel-boring and turning lathes, &c., put up and in operation.

The following machines, &c., are in hand in various stages of finish:
1 machine, double, for profiling stocks.
1 do for 2d facing do
1 do for cutting edges of components.
1 do geared, for drilling cast-steel barrels.
1 do do for turning barrels.

The repairs to the old water wheels, penstocks, &c., tilt hammers, and frames, &c., that have not yet been renewed, at both the musket and rifle factory, have, as usual, from their worn down condition, been extensive and at considerable cost; the necessity, too, for temporarily fitting up certain machines during the time that the machines and machinery of the old shops were being transferred to the new, is an item of expense, by no means small, going to increase the cost of the arms for the year.

At the musket factory, the whole of the stocking machinery has been, within the year, transferred to the new shop, and a new building, intended for the machine shop, is now nearly half built up on the site of the old stocking shop; and at the rifle factory all the cutting machines for components, the barrel-boring, turning and rifling machines, together with the whole of the stocking machines, have been transferred to the new finishing shop, and are, generally, in operation. The old buildings which accommodated these operations are now taken down, preparatory to the erection, on the site, of a new shop for tilt hammers, and forging and swedging.

Preparatory to commencing the fabrication of cast-steel rifle barrels, to take the place of iron, careful trials were made to determine the best form for the drills and manner of drilling; also, the quality of the steel as well as shapes of the bar.

These important points have all been ascertained. The drilling machines
are in course of fabrication—two of them nearly completed, so that early in the present year a portion of the rifles fabricated will be with cast-steel barrels, until the iron on hand is all used up, when the cast steel only will be used for the arm.

The alteration of the flint-lock muskets to percussion has been commenced, and will be continued as actively as our facilities for the work will allow, until the whole of those on hand are altered.

Buildings, and other permanent improvements.

1st. The south wing of new stocking and machine shop, at the musket factory, is completed, and the whole of the machinery (stocking) transferred to it, and in operation.

The centre building for offices and north wing for machine shop is built up to the second floor. The dimensions of this building are: centre, $35\frac{1}{2} \times 48$ feet, (enclosing water wheel;) wings, each $35\frac{1}{2} \times 89$ feet, two stories, built of brick, on stone foundations. Iron door and window frames, with sheet-iron roof.

2d. Lumber house, musket factory, is completed except the slating of the roof, which is half done. Dimensions, $53\frac{1}{4} \times 78$ feet. The lower story is of stone, which includes and covers the bituminous coal bins; the upper story of brick, the openings having wooden frames fitted with blinds.

3d. Tilt-hammer shop, at musket factory, has been commenced, about half of the excavation and stone foundation being done. The dimensions of this shop will be $53\frac{1}{4} \times 188$ feet, one story brick, on stone foundation, roofed with slate, window and door frames of cast iron.

4th. A store room $15 \times 45$ feet has been constructed under the B. & O. railroad, for the deposit of scrap iron, steel, &c.

5th. The wooden floor of new storehouse, at the musket factory, being decayed, fell in; the damage has been repaired by filling in the space an average depth of five feet with quarry spalls, and covering with large stone flagging.

6th. The front enclosing wall of armory yard has been commenced, and 130 feet linear completed, round the site of one of the buildings recently purchased on lot No. 12.

7th. The quarters of the paymaster and military storekeeper all completed and occupied, and about 80 panels of paling fencing put up to enclose the ground attached.

8th. Several small buildings of stone, brick, and wood have been constructed, being additions to buildings occupied by clerks, inspectors, and armorer's, including also a smoke house at the commanding officer's quarters.

Repairs to workshops have been made and to the dwelling houses, except those considered not worth the cost.

WATERVLIET ARSENAL, COMMANDED BY LIEUT. COLONEL BAKER.

Since the report of June, 1848, the following items of permanent improvements have been made:

1st. The north stone quarters reported last year as under roof have been finished, and are now occupied by officers.
2d. The carriage store, reported finished except flagging, has been completed, and is now used as a storehouse.

3d. The basin at the workshops has been walled.

4th. A percussion laboratory has been built.

In addition to the foregoing the following improvements have been commenced, viz:

1st. A stone magazine of the form and dimensions of the stone magazine at the post.

2d. The stone wall on the west end of the public land has been taken down, and walls are being constructed on the sides of the triangular piece of ground upon which the magazine is to be erected.

3d. The north brick quarters are undergoing interior repairs, new slating, painting, &c.

4th. The several buildings requiring it are being painted.

Among the ordnance stores fabricated since last report, may be enumerated the following, viz:

- 8 3-pounder field-carriages.
- 6 3-pounder field-caissons.
- 40 6-pounder field-carriages.
- 4 mountain howitzer carriages, with limbers.
- 15 mountain howitzer shafts.
- 14 battery wagons.
- 52 8-inch columbiad casemate chassis.
- 52 8-inch columbiad casemate upper carriages.
- 15 32-pounder casemate chassis.
- 5 travelling forges.
- 39 sponges and rammers.
- 20 sets of 6-pounder carriage irons.
- 35 field-worms.
- 7 tompions.
- 74 portfire stocks.
- 6 portfire cases.
- 50 vent covers.
- 24 powder measures.
- 2 pendulum hausses.
- 198 sponge covers.
- 22 fuse mallets.
- 22 fuse funnels.
- 121 priming horns.
- 78 valises.
- 186 artillery whips.
- 5 mortar platforms.
- 6 pent-houses.
- 390 pounds paint.
- 41 pick-axes.
- 25 screw jacks.
- 583 packing boxes.
- 24 poles, spare.
- 15 wheels, spare.
- 52 stirrups.
- 140 pairs names.
- 75 vent punches.
- 27 pintles, "barbette."
5,350 paper fuses.
96 howitzer canister shot.
39 shells, strapped.
619 cap pouches.
1,450 cartridge bags.
378 6-pounder canister shot, fixed.
20 12-pounder spherical case shot, strapped.
276 mountain howitzer case shot, fixed.
90 6-pounder cartridges.
6,000 musket cartridges, blank.
55 trail handspikes.
48 mountain howitzer ammunition chests.
6,255,000 percussion caps.

Several new machines have been added to those in use last year, and the alteration and repair of the workshops has been completed. Large quantities of old ordnance stores, arms, harness, &c., received back from Mexico, have been overhauled and repaired or broken up.

WASHINGTON ARSENAL, COMMANDED BY MAJOR MORDECAI.

PRINCIPAL OPERATIONS AT WASHINGTON ARSENAL DURING THE YEAR ENDED JUNE 30, 1849.

I. Permanent improvements.

The new powder magazine for the use of this arsenal, which was reported last year as in progress of construction, has been completed, and is now occupied. A dwelling-house for the keeper of the magazine has been built, and the grounds partly planted and improved.

At the arsenal, the construction of a large artillery storehouse was commenced in the spring of this year, and satisfactory progress has been made in the work so as to finish it early in the autumn.

Extensive repairs and alterations have been made in the officers' quarters.

The wharf on the eastern branch of the Potomac, which had become unsafe by settling and decay, has been rebuilt.

The machine shops at this arsenal are in a bad condition. They were unfortunately erected on ground which was gained from the river and the marshes, and although they were a few years ago very extensively repaired and the walls of the principal shop rebuilt, they are now so much cracked as to endanger their permanence for any great length of time, and to interfere materially with the efficient action of the machinery. They ought not to be rebuilt on the present site, but, in consequence of the crowded state of the grounds within the actual limits of the arsenal, I am not now prepared to offer a plan for renewing these shops. I think it my duty, however, to present the subject to the consideration of the Ordnance department, with a view to the adoption of some timely measures to remedy the impending evil.

2. Machinery.

Several valuable additions have been made to the machinery at the arsenal for facilitating and perfecting the work, and the necessary arrangements have been made for altering flint muskets to percussion.
The new machine for forming and charging percussion caps, which was mentioned in my last annual report as having been just finished, has more than answered the expectations then formed of it. The average work done by this machine during the last month in which it was in operation was at the rate of 50,000 caps in 10 hours.

3. Work done.

The following are the principal articles fabricated at this arsenal during the past year:

78 chassis for 32-pounder casemate carriages.
58 casemate gun-carriages for 8-inch columbiads.
100 sets of iron work for 8-inch columbiad casemate carriages.
75 sets of iron work for 32-pounder barbette carriages.
50 6-pounder field gun carriages, with implements and equipments complete.
12 portable forges.
12 pairs of chests with carriage-makers' tools, for mountain service.
2,541,000 percussion caps for small-arms.
3,500 cartridge bags for field and garrison service.
725 signal rockets.
5,500 muskets cleaned.
451 rifles repaired and browned.

The alteration of flint muskets to percussion has been just commenced, under the instructions lately issued from the Ordnance office. Arrangements have been made for altering the muskets at the rate of about 1,500 a month.

ALLEGHENY ARSENAL, COMMANDED BY CAPTAIN HARDING.

STATEMENT OF THE PRINCIPAL OPERATIONS AT ALLEGHENY ARSENAL DURING THE YEAR ENDED JUNE 30, 1849.

Articles fabricated.

20 6-pounder stock trail carriages.
7 caissons, assorted.
1 travelling forge.
2 12-pounder howitzer blockhouse carriages.
34 rammers and sponges for field artillery.
2 6-pounder worms and staves.
5 tar buckets.
14 linstocks.
12 portfire stocks.
52 portfire cases, leather.
51 tube pouches.
84 thumbstalls.
2 gunners' quadrants.
82 gunners' haversacks.
31 gunners' punches.
6 gunners' hammers.
2 budge barrels.
2 fuse extractors.
4 fuse seters, brass.
4 fuse mallets.
1 leg guard.
3,360 canister shot.
176 infantry cartridge boxes.
620 infantry cartridge box belts.
98 bayonet scabbards.
5,521 do. with frogs.
1,880 cavalry sabre belts.
1,360 sabre belts.
400 percussion cap-pockets.
141 6-pounder flannel cartridges.
72 handspikes, assorted.
8 elevating screws.
35 pintles for barbette carriages.
9,280 cartridge box and belt-plates.
10 pounds copper nails.
2 shovels.
193 packing boxes.
6 brass weights.
1 vertical drilling machine.
910 feet of cast iron cannon skidding, and
570 feet cast-iron shot frames, cast, and part laid.
1,874 muskets, 87 rifles, 67 pistols, 26 musketoons, 26 musket bayonets,
2,200 brushes and picks, and 10,129 box and belt plates, altered from unserviceable to serviceable.
116 feet of wooden and 40 feet of copper gutters, and 140 feet of copper and 180 feet of tin spouts, made and fixed on buildings.
113 feet of copper pipe made.
14,625 muskets cleaned, oiled, &c.
19,990 pounds of iron-castings for buildings, carriages, and machines, and
296 pieces of brass castings for do do do
A new magazine (for ammunition) about half completed.
An addition, 54 by 15 feet, put to the iron foundry.
350 feet of board fence erected.
60 ornamental trees planted.
The quarters, barracks, work-shops, laboratories, water works, roads, walks, sewers, machinery, tools, &c., &c., extensively improved and repaired.

NORTH CAROLINA ARSENAL, COMMANDED BY CAPTAIN BRADFORD.

STATEMENT OF THE PRINCIPAL OPERATIONS AT THIS ARSENAL DURING THE YEAR WHICH TERMINATED WITH THE 30TH JUNE, 1849.

Work done.

1st. On permanent stable—racks, mangers, and water troughs made and placed in the stalls; stall divisions erected; bins constructed in granery; large slat-frame for hay in bulk put up in second story, interior of cistern
cased and replastered with cement to arrest leakage; platform steps made and placed at side entrance; and exterior and interior woodwork painted, &c., &c.

2d. On timber store No. 1, 17 outer (to receive ventilating slats) frames made and placed in basement story, and the same number of ventilating frames made for and fitted in them; 37 of a larger size, and 74 ventilating slat frames for them, made and placed in the upper story; 37 Venetian ventilating blinds made and placed above the frames in same story; floor (2½ inches thick) laid; all the woodwork painted; interior walls yellow-washed; and the building completed and ready for use.

Timber storehouse No. 1 and permanent stable completed and ready for use.

Gun carriage and coal store—148 by 36 feet. This building was begun since last report, and its walls have been carried up their entire height, and are ready to receive the roof; the trusses of which are constructed and ready for position; the slate for the roof has been ordered, and is in transit; and the lumber for the sheathing of the roof, for the floor, the doors, window shutters, &c., is on hand and ready for use.

Gun carriage and paint shop—140 by 20 feet. This building, also, has been begun since last report, and the walls carried up to the level of the window-sills, where they are arrested by the exhaustion of the supply of brick on hand. The door and window-frames are made; the roof trusses are made in part; the slate for the roof is ordered and on the way; and the lumber and other materials necessary to complete the building are procured and ready for use.

Auxiliary and miscellaneous work—614 square yards grading done in rear of line of shops and of timber store No. 1; 74 cubic yards of earth removed from same places and disposed to level the terreplein of the square; 60 cubic yards grading done round laboratory building; 112,953 feet of assorted lumber received and piled for seasoning; 1,176 square yards whitewash laid on interior walls of shops, &c.; 34,357 cubic feet clay, and 12,524 cubic feet sand, hauled from pits to arsenal site; 3 kiln and brick-sheds erected; 350,857 bricks moulded—of which 250,000 have been set in kiln, burnt, and hauled thence to the several building sites. Main avenue, connecting the square with the rear grounds, (500 yards long by 20 feet wide,) grubbed, graded, and finished; 500 running feet of permanent fence re-adjusted, repaired, and renewed; 1,685 running feet of temporary fence erected; the entire exterior wood and stone work of the arsenal, the barracks, Smith's shop, and both the exterior and interior of the northwest (office) tower repainted and washed, &c., &c.

300 six-pounder cartridge bags made; 25 brick moulds made; new pump and boxes made for brick-yard well; force-pumps of cisterns fitted with new valves and otherwise repaired; the guns and carriages of the field battery repeatedly cleaned, and the harness examined, rubbed, oiled, &c.; 2,000 small black-jack oak trees culled from the rear grounds, hauled to the kiln and consumed in burning brick, as were also several cords of pine wood taken out of the line of the avenue; 90 elm, shade, and various fruit trees planted and transferred; together with the repairs, &c., of tools, implements, &c.; the usual police and other duties under this head, common to the post.
WATERTOWN ARSENAL, IN CHARGE OF MILITARY STOREKEEPER J. A. WEBBER.

On reference to the report from this arsenal under date of 30th of June last; it will be observed that, for various reasons therein stated, several of the objects contemplated by former appropriations remained partially or wholly unaccomplished. They were as follows:

1. Repairing forges in the smith’s shop.
2. Rebuilding the wall on the south front of the arsenal yard.
3. Constructing racks for muskets in the south arsenal.
4. Constructing permanent shot beds and gun-skidding.

In addition to the above, the assignments for this arsenal for the fiscal year ending this date, were as follows:

1. For raising the smith’s shop one story and extending it thirty feet and erecting a chimney for the boiler of the steam engine.
2. For constructing a fan, blast-pipe, and flues for forges in the smith’s shop.
3. For constructing a cistern in the engine-room.
4. For pointing with cement the underpinning of the arsenal walls and buildings, the cornices of the north and south arsenals, and the stone-work of the large magazine.
5. For steam-pipes for warming shops.
6. For general repairs and preservation of the public buildings.

All the objects above specified have been fully accomplished within the last year, with the single exception of the permanent shot-beds and gun-skidding. But the materials for the latter have been mostly assembled and will be put in place in the ensuing quarter.

Six new forges have been constructed in the smith’s shop, with cast-iron beds, backs, tops, and water troughs, which are supplied with water by pipes brought from the cistern in the engine-room. They are furnished with an air-blast, and the draught of each is into one main horizontal flue communicating with the chimney stack.

The plinth for the fence on the south front of the arsenal, represented as finished in my last report, has been surmounted by a neat and substantial structure of iron castings, and the enclosure of the yard on that front completed by two iron gates.

An additional story has been raised on the smith’s shop, and extended thirty feet over the engine-room, furnishing us with two apartments, each sixty-seven and fifty-nine feet long by twenty-eight feet wide, suitable for armorer's shops; a passage-way thirteen feet wide, and a master-workman’s room twelve by thirteen feet. To give access to these rooms, a projection was erected on the east side of the smith’s shop to cover a stairway, and under it is constructed a cellar to contain coal for the forges. In this connexion it may be stated, though before alluded to, that the chimney stack has been raised twenty-six feet eight inches, making its whole height sixty-eight feet eight inches, to secure a more thorough draught for the forges.

On consideration it was deemed advisable, as the most economic method, to make use of a capacious well existing in the vicinity of the carpenter’s shop for supplying water to the engine room, instead of constructing a cistern especially for the purpose. To effect this, a new shaft of a sufficient depth was sunk in the carpenter’s shop, and the space between it and the well referred to tunnelled to receive the leading pipe of a forcing pump placed at the bottom of the former. This pump being worked
from the main shaft that drives the machinery in the carpenter's shop, will afford an abundant supply of water to the engine room or any other building in the arsenal where it may be required.

The underpinning of the several walls and buildings of this establishment, the cornices and beltings of the latter, and the walls of the large magazine, have been pointed in a very thorough manner and finished with raised joints.

Steam-pipes for warming the shops have been put up in both stories of the carpenter's shop and in the finishing shop. They are carried entirely round the apartments in both, and are heated entirely by the escape steam of the engine. This arrangement afforded a very agreeable degree of warmth in the shops, even during the severe cold weather of last winter, and enabled us to dispense with the use of stoves and furnaces altogether in those buildings.

All necessary repairs for the preservation of the public buildings and the valuable property contained in them have been made as occasion required.

During the year ten sets of iron work for 32-pounder barbette carriages have been constructed, and many useful tools made for use in the shops. Two of the gauge lathes have been repaired and fitted up with new heads, and in part new gearing, and made into serviceable machines. A considerable addition has also been made to the machine shafting, and a fan blower attached to the furnace of the engine boiler. Racks for tools and other convenient fixtures have been put up in the various shops and other buildings, and sundry minor improvements made to promote comfort and order among the workmen.

Within the same period, there have been purchased, inspected, and stored at this arsenal:

228,078 feet superficial white oak gun-carriage timber.
109,000 fuse-wood, various sizes.
7,507 superficial feet bass-wood, dimension stuff for sponge heads, and
65,000 feet of dimension pine boards for gun-carriage pent-houses.

The white oak timber referred to completes the following sets for gun carriages now in store for seasoning:

60 sets for 10-inch columbiad.
60 " 8-inch "
150 " 42-pounder casemate.
120 " 32-pounder "
250 " 32-pounder barbette and
120 " 24-pounder "

The arms, implements, and accoutrements of the first regiment Massachusetts volunteers and the ninth regiment of infantry, on the disbandment of those regiments, and 5,283 boxes, 513 kegs, and 371 barrels of fixed ammunition and powder returned from Mexico, were received during the same period. Most of the arms and accoutrements are rendered worthless by hard usage, or want of care; and much of the ammunition is in a damaged and useless condition. All of it had to be examined, and an account made of it, before it could be stored in our magazines. True economy would have been consulted had the worthless part of this ammunition been thrown overboard in the gulf of Mexico, instead of being transported from Vera Cruz and Brazos to our arsenals.

The time not given to the foregoing objects has been devoted to the preservation of stores at the post, and of the ordinance in the harbor of
Boston: the manufacture of ammunition for proving guns at South Boston; the improvement of the public grounds and general police of the arsenal.

BREVET MAJOR HAGNER'S REPORT.

WASHINGTON CITY, October 25, 1849.

General: Having reported my return from Europe within the time prescribed by your orders of the 9th of October, 1848, I have now the honor to submit the accompanying notes of observations made, during my absence, upon the subjects to which my attention was therein specially directed, as well as “such information as I could procure upon the system of artillery, and of the armament and equipment of troops,” in the countries I visited. A person of limited experience, travelling alone among so much that is different from what he has been accustomed to at home, must needs be frequently perplexed by the desire, on the one hand, of reaping, for his service, all the advantages the opportunities afford, and by his fears, on the other, that much of what he notes may be considered by those better instructed unimportant. Laboring, especially, under this disadvantage myself, I must pray your indulgence to this report—due to me further, as the period of my visit to Europe was particularly unpropitious for a minute professional examination. Most of the experiments usually in practice upon subjects interesting to the artillery had been suspended; and, in some cases, the establishments of that corps closed to foreign visitors, owing to the political disturbances which have existed during the last two years in nearly all the continental States. But, while claiming all reasonable indulgence on this account, I must not neglect to call your attention to the many instances in which I have been favored by the polite attentions of artillery officers, in furtherance of the objects of my visit, and to the complimentary terms in which they have spoken of the practical operations of our artillery, and of the published report of balistic experiments recently made at the Washington arsenal. The few publications upon these subjects by our officers, and the unfrequency of intercourse, (by officers,) have kept them very ignorant of the actual condition of our artillery, and especially of the mechanical advances we have made of late years, so that I found them generally anxious to know details of our fabrication, and surprised at the results we have obtained. The report will show how much more general with us is the use of machines, and the advantages we have gained thereby in accuracy and neatness of work; and also the skill and economy they have been able to introduce in their fabrications, and the progress they have made, in many instances, in the science of artillery. The advantages thus derived by them from their well directed schools of practice, and the constant interchange of results by the publication of experiments, will prove the necessity of similar efforts upon our part, and especially that of spreading among our officers the details of the many valuable experiments reported annually to the Ordnance Office. Such a course would early secure to us the practical advantages of proposed improvements, which now come more tardily, after being matured abroad.

I cannot refrain from expressing the gratification derived from comparing the general condition of our arsenals and armories (as well in the machinery used and the character of the work done as in the comfort and well-
being of the workmen and the cleanliness and neatness of the establishments) with the most advanced of those abroad. The superiority in these respects is generally with us; and in every case one cannot fail to remark that the absence of official responsibility in the management of these establishments has, as a result, the absence of comfort, cleanliness, and care for the workmen.

In order to give the fullest information upon the manufacture of percussion powder and caps and that of small arms, I have not confined my remarks upon these subjects to the places particularly directed in your orders, but have mentioned the details of these operations as pursued at the establishments of France, Belgium, Holland, and England. Such peculiarities as I noticed in the different arsenals and in the armament and equipment of troops then follow, and a few remarks upon other subjects, generally interesting to military men, conclude the report. In the description of machines and modes of fabrication, I have endeavored to be sufficiently explicit to make these notes practically useful, as they are; but I can, I think, furnish any other necessary detail which I may have omitted in my desire not to be unnecessarily prolix.

I have purchased for the office some few publications upon military subjects which I thought would be useful, and have made arrangements to receive information of the future appearance of any others of professional interest.

The infantry officer's sabre, in the French service, was spoken of so highly by the corps who had used it most, that I thought it best to purchase one for trial. The chronographe (for use in experimenting,) greatly improved by a very simple marking apparatus, will also, I am sure, prove very useful.

Hoping that my efforts, earnestly made for the advancement of the service, may be productive of some good, and that you may not regret the high honor you did me by selecting me for this duty, I beg, most respectfully, to subscribe myself

Your obedient servant,

P. V. HAGNER,
Brevet Major, and First Lieutenant of Ordnance.

General George Talcott,
Chief of Ordnance.
NOTES.

PERCUSSION CAPS—FRANCE.

There is but one capsuline in France; it is under charge of a major, with two captains as assistants, and embraces the establishment for making caps and friction tubes at Paris, and that for filling and finishing them at Montreuil, about nine miles distant. Major Didion, the director, was kind enough to accompany me through the first, and to give me an order for entrance into that at Montreuil.

The copper is bought in sheets at 2.50 francs the kilogramme, (about 21\(\frac{1}{2}\) cents per pound,) and the scraps are exchanged for new at 35 centimes (about 6\(\frac{1}{2}\) cents) the kilogramme, additional. The sheets are cut into strips and rolled by machines moved by steam power, then annealed in a furnace, washed in acid and water, and transferred to the cap room. The machines here used are worked and fed by hand. Three are required to complete the cap—the first cutting the stars, the second forming the cup, and the third pressing down the flange and clipping the points to a length. The first machine it is said can cut 83,000 stars per day of 10 hours. The caps are then rolled in a barrel with saw-dust, which cleans and polishes them, and sent to Montreuil. Here the first operations for making the fulminate are conducted under a shed open to the south.

Three hundred grammes of mercury are dissolved in a glass matraz containing 2.3 litres of nitric acid at 40°, by means of a sand bath. When dissolved, the solution is poured into a large glass vessel containing 3.3 litres of alcohol. This vessel, of a capacity of about fifteen gallons, has a mouth about four inches diameter, and a nozzle of the same diameter; tightly luted to this last is a glass tube three inches diameter, six feet long, covered with zinc, inclined to the ground at an angle of about 15°. In the interior of this large tube a small glass tube runs down and back, conveying water from a reservoir above, which is discharged at the highest end after passing through the tube, thus cooling the furnaces which fill the large tube. The lower end of the large tube is luted to the nozzle of one of a system of earthen jars, arranged side by side in the open air, which are connected by means of short tubes tightly luted to the adjacent nozzles, (each jar having two nozzles and a month.) Ten are usually employed, but sometimes more; the last jar has one nozzle left open for the escape of the uncondensed fumes. With ten jars, some deposite of alcohol and mercury is made in the tenth, but only about one-sixth of that made in the first. The alcohol used was said to be of a strength of 39°, and that condensed about 35° or 36°. This alcohol is used in checking the ebullition in the glass jars toward the end of the process. In every 100 kilogrammes of mercury used, two kilogrammes are saved by condensed the fumes, and 35 per cent. in quantity of the alcohol. One kilogramme of fulminate (in addition) is obtained from each kilogramme of mercury.

The fulminate is placed in earthen pans, to be washed and drained; the pans have a hole in the bottom, plugged loosely with flannel. After being well washed, it is placed in glass bottles, with water, and carried to the mixing-house—a frame building of one room. Here the unabsorbed water is carefully skimmed with a wooden spoon, from a portion of fulminate, sufficient (with the proportion of nitre) to make one kilogramme
in weight. The mixture is made on a marble table, with a horn spatula, and the mass formed into a cake and placed upon a sheet of thick brown paper. These papers are taken to the drying and sifting house—likewise a frame building, of one room, fifty yards distant—and the cakes are there broken up while moist, and spread to dry upon shelves, each cake on its sheet. After partial drying, the powder is passed through a copper wire sieve, by hand, (covered with a thick leather glove,) then replaced upon the shelf to dry; and when dry enough to be pulverized, is passed through a horse-hair sieve. This last sifting is done upon a table surrounded above with curtains, the front curtains having sleeves for the passage of the hands; the workman is thus protected from the dust. The powder is then collected in covered wooden boxes, and taken to the filling-room. The sifting-room is kept at a temperature of 15° centigrade, being heated when necessary by a stove projecting within the room, but fed from without. In the mixing-room were about one hundred pans of moist composition, and in the drying-room more than a hundred kilogrammes of powder, in the different stages towards completion. Sometimes (the workman said) there was even more there, as no orders exist limiting its accumulation. The mixer is a man, receiving four-and-a-half francs a day; a man also aids the master in making the fulminate; but the attendant in the drying-room is a woman, who alone, pulverizes and sifts the powder, receiving but thirty-six sous a day. In the charging-room are three women and one man; two of the women fill the receivers with empty caps, passing them to the third, who charges the caps by means of a charger with a sliding bottom, one hundred at a time; she hands the charged receiver to the pressman, who, placing upon it a cover with points entering the caps, passes the two through a press, the jaws of which are of quadrant form; these revolving a quarter-revolution, by means of a crank moved by the man, take with them the receiver, delivering it on the opposite side, the caps equally pressed. He empties the receiver into a trough, conveying the caps (over a tub of water to absorb the dust) into a covered reservoir. From here they go to the varnishing-room: in this room are women only. Boards containing five hundred caps are used; with a droptube a drop of varnish is deposited in each cap: after half an hour the board is again examined, to spread the varnish and take off the surplus, if necessary: The caps are then counted into linen bags containing 20,000, half at each end of the bag, and removed to the drying room: this is of brick, heated by a stove, with racks suspended from the ceiling; the bags are swung upon the racks, and exposed for forty-eight hours to a heat of 50° centigrade. They are then placed in bags of 10,000, marked with the date of manufacture, and after inspection by a board of officers, (which assembles from time to time,) the bags are sealed and stamped, and sent to the castle of Vincennes to be stored. The cost of the fulminate is said to be 22 francs the kilogramme, ($1.89 per pound;) and of the finished caps, 94 cents a thousand. No accident has ever occurred here.

Friction tubes. These are formed of two pressed copper tubes and a brass wire tongue. The smaller tube, (containing the friction powder,) with the wire tongue attached, is placed within the larger one, charged with rifle powder; the upper end of which is choked, to prevent the passage of the small tube, but not the wire; both ends of the large tube are then closed with wax. Upon pulling upon the wire, its roughened end
passes through the small tube, igniting its charge, and thence that of the other tube. The metal part is made at the establishment in Paris; the larger tubes being formed from discs of sheet copper one and a quarter inch diameter, by pressure in nine different machines, and the smaller ones, from ends of these, by four additional machines. Several other machines are used in completing them, all moved by hand. The metal parts, finished, are sent to Montreuil, and there filled, in shops distinct from the cap shops. The friction powder is composed of two parts of sulphuret of antimony and four parts of chlorate of potassa. This can be used with safety, and costs only fire and a quarter francs per kilogram. The finished tube is said to cost twenty-five sous the hundred. These tubes are manufactured in great numbers, and are to replace the use of the lock.

PERCUSSION CAPS—BELGIUM.

The caps are made at the arsenal in the town of Liège, and, after examination by a board of officers, are issued to the director of the laboratory, who is charged with the preparation of all ammunition. The cap machine-room, at the arsenal, contains six machines (two cutters and four punches) moved by steam power, and capable of making 100,000 caps a day. The copper having been cut into strips, and rolled, the strips are fed by hand into the cutting machine; double dies cut two stars at once; the stars are then examined, and passed by hand to the punch machine, which forms the cap, and cuts, at the same time, the point to a length. The caps are again examined, and counted by means of filling boards, and placed in boxes ready for inspection. The cap filling-shops are detached from all other work; the different buildings required being upon the terrepleins of the advanced works of the citadel, separated from each other by traverses, where more than one is in the same angle of the work. The operations had been conducted here for eight years without accident; but soon after my visit I heard of a slight accident having occurred, the particulars of which, by the kindness of the director, I am enabled to give attached hereto, in a translation of his report.

In making the fulminate, the proportions used differ slightly from the French: 4.500 kilogrammes of nitric acid at 36°, 0.450 kilogramme of mercury, dissolved in a matrass on a sand bath, is poured into a large glass retort containing 5 litres of alcohol. Nine condensing vessels are attached to the retort, and the last of the series to the chimney of the house in which this operation is conducted. No water is used in assisting the cooling. The retort contains, after the fumes have passed off, 700 grammes of moist fulminate, or 500 of dry; and the product of the condensation is 2 per cent. of mercury and a quantity of alcohol, which (after being conveyed to a tank outside of the house and treated with lime to extract the acid) gives 20 per cent. of the quantity used, of greater strength than it by 4°. This alcohol is preserved for making varnish, being found to be more advantageous for this purpose than the alcohol of commerce. The moist powder, with its proportion of nitre, is mixed upon a round marble table with high edges, by means of a pair of rakes and a pair of scrapers attached to a vertical arbor, and moved by gearing connected with a hand wheel in a detached building. The object desired being a mere mixing of the material without compression, the rakes level the piles raised by the scrapers without touching the marble. The charge upon the table is, 1.880 kilo-
gramme of moist fulminate, 0.666 kilogramme of nitre, 2.000 kilogrammes of dust from previous siftings, as explained hereafter.

No one is present in the room during the mixing. The motion is continued for 30 minutes, and the powder is then transferred to pieces of oiled silk and carried to the drying house, where the pieces of silk are placed, with their contents, upon hot water dishes, made of zinc, about 2 feet square. When sufficiently dry to be pulverized, the powder, enveloped in the silk, is removed to the sifting-house, and the above charge divided into two portions, each placed in a sieve with a parchment bottom, having holes of the size of fine rifle powder. With the powder is placed in each sieve a circular beater, made of wood, covered with leather; weight, 1 pound; diameter, 8 inches; thickness in the centre, 1/4 inch; sloping towards the periphery. The sieves, having covers about their size fitting upon them, fit, as covers, upon other sieves with bottoms of silk cloth, which themselves fit upon boxes with solid parchment bottoms. All the rims are tightly covered inside and out with leather, and each set of 4 pieces bound together with straps; other straps are attached to connect them to the sifting frame. This consists of a horizontal hoop, with arms, made of 1/2 inch iron, about 8 feet diameter. It revolves with a vertical arbor having a double crank, supported in sockets at the floor and ceiling, and connected below the floor, by band gearing, with a hand wheel in a detached building. An up-and-down motion is given to the hoop, while revolving, by means of cords from the arms to the ceiling. The two sets of sieves are fastened to the frame at opposite ends of the same diameter. After fifteen minutes' turning, all the powder will have descended from the top sieve, and the dust have passed through the silk to the bottom box. This is put away to be used again in the batch for mixing, (in the proportion above stated,) and the grain powder remaining upon the silk is placed in straw-covered glass bottles and deposited in the magazine for use. The impression is, that the dust powder is not suitable for filling caps.

The charging house consists of a large room, with an ante chamber and a small hopper shed, abutting against the large room, but separated from it by a thick plate of sheet iron. In this shed is the hopper, capable of containing about 3/4 pound of percussion powder; its sliding bottom is opened by a treadle, the foot of which passes through the iron plate into the large room. To fill the hopper, the attendant enters by the door of the shed; and to charge the caps, a receiver of the ordinary kind, containing 56 empty caps, is placed by hand under the hopper, through a second hole in the iron plate, in a proper position for this object; and, by touching the treadle, and then moving an arm, the proper charge is deposited in each cap, and the bottom of the hopper again closed. The receiver is then passed to the pressman, who applies the cover, with its 56 points fitting in the caps, and places it under the press, the power of which is estimated at 10,000 kilogrammes. There are two presses in this room, working vertically, by means of cranks in the ante-chamber, each revolution of the crank bringing down and lifting up the piston. After pressing, the cover is removed, and the receiver passes to the varnishing table; there it is placed in the bed of a small machine constructed so as to bring 56 points (from a reservoir of varnish into which they dip) over the 56 caps. The caps are then withdrawn from the receiver by a withdrawing-board and placed upon a drying board, cup uppermost. When full, these boards are placed upon shelves in this room, and left to dry; 14 workmen, 2 non commissioned officers, and an
officer, are usually present in this room. (All these men were present at the moment of the explosion of the hopper on the 24th of July last.)

Composition of varnish: alcohol at $40^\circ$, (95 per cent.) 135 parts; gum shellac, 40 parts; resin colophane, 10 parts.

For issue, the caps are packed in tin boxes containing 10,000.

Cost of 1 kilogramme of fulminate, 27.20 francs—$2 31\frac{1}{2}$ per pound.

Cost of 1 kilogramme of percussion powder, 27.70 francs—$2 35\frac{1}{4}$ per pound.

Cost of 1 kilogramme of varnish, 1.70 franc—14\frac{3}{4} cents per pound.

Cost of 1,000,000 of caps, (filled,) 5,000 francs—$912 50.

[Colonel Timmerhans told me that, when he commanded the laboratory, he had made 10,000,000 of caps to complete an order, and that the cost, including the interest upon the establishment, was only 3,450 francs per million, or 64 \frac{1}{2} cents the thousand.]

PRIVATE ESTABLISHMENTS—LIEGE.

Messrs. Falisse & Co. are large manufacturers of percussion caps and of the machines for making them. The plan pursued by them is said to be nearly the same as that of the government establishment. As their establishment was not in operation while I was at Liège, I could not see it. They have not been so successful in avoiding accidents, the officers told me, as they had been. Last year an explosion of the hopper took place, and slight accidents had occurred previously. Mr. Falisse told me that with thirty persons, twenty of whom were boys or women, he could make the powder and finish complete 150,000 caps per day; and that he could deliver them in New York at 94 cents the thousand. He said that he had recently returned from putting up a set of his machines in Spain, which they preferred to the English machines, made recently for them at Woolwich arsenal. As in the machine already described, the stars are cut by one machine, and fed by hand to a second, which forms the cap.

PERCUSSION CAPS—SWITZERLAND.

Samples of these caps, made at Zurich, accompany this report. The manufactory was not visited. The star is cut into twelve points, and a thin disc of copper covers the powder instead of varnish. An accident occurred here in the summer of 1848, killing two men.

PERCUSSION CAPS—PRUSSIA.

The priming for the new musket is placed in the end of the paper sabot, upon which the ball rests. It is composed of one part sulphuret of antimony and six parts chlorate of potassa, moistened with a little gum arabic or tragacanth. The percussion cap for ordinary percussion arms is made at Erfurt, but the establishment was not visited. The powder is covered as in the Swiss cap, with a disc of copper without varnish.

PERCUSSION CAPS—HOLLAND.

The caps are made at the arsenal at Delft, and issued to the director of the laboratory. The machines used are similar to those in use at Liège, in
construction; but the one making the cap from the star did not work well
in my presence, owing, they said, to the copper not being of good quality.
The operations of making the powder and charging the cap are conducted,
as at Liège, at a special establishment, at a distance from others, consisting
of many buildings separated from each other by traverses of earth. Such
differences only as were noticed in the course of the fabrication will be
stated. The jars used in condensing the fumes are placed in tubs of
water. The proportions used are as follows: 0.367 kilogramme of mer-
ccury, 4.111 kilogrammes of nitric acid at 4°, 4.25 litres of alcohol at 30°;
producing 0.546 kilogramme of fulminate moist—100 parts of mercury
giving 116 or 117 parts of fulminate. By condensation 40 per cent. of
alcohol at 30° and 3 per cent. of mercury are saved. 1.4 kilogramme of
moist fulmineae, 0.6 kilogramme of nitre, (first mixed with a horn fork
upon an earthen dish,) and the dust of former operations, to the maxi-
num extent of 1.5 kilogramme, gradually added, are transferred to the
marble grinding table, where the mass is ground under a pressure of 150
kilogrammes for two hours by two heavy wooden rollers, followed by two
scrapers; all moved by gearing from a hand-wheel in a detached building.
An attendant stands by the table during this operation with a wet sponge,
wiping up all the dry particles and keeping the material moist. After the
grinding, the paste is scraped from the table, made into a cake, and taken
to another building, where the cake is cut into small pea-sized bits with a
horn spatula upon a piece of oiled silk cloth. A temperature of 15° cen-
tigrade is maintained in this room, (artificially, if necessary.) When
dry enough to pulverize, the ends of the cloth are folded over the mate-
rial, all is placed in a box, covered, and carried to the sifting room. This
differs from that at Liège in having the arbor of the sifting-circle only
two and a half feet high above the floor, with one elbow, and not con-
ected with the ceiling. An attendant with a moist sponge is always
ready to wipe up the dust which may be upon the sieves before joining
them, or which may fall during the sifting. The grains of powder found
on the silk bottom sieve are collected upon a sheet of paper and carried to
the drying house, and there the sheets are extended upon hot-water
dishes made of zinc, with sides and bottom enveloped in sheepskin with
the wool on. The dishes are in boxes six inches high, open in front.
The powder remains thus two days, the water being kept hot. It is then
put into glass boules, one and a half kilogramme in each, and stored in
the magazine. The dust collected in the bottom of the sieves is likewise
bottled and stored till wanted. The magazine is a light frame building
with windows, and used exclusively for percussion powder. The press
and charging building is arranged as at Liège. The plate between the
hopper-shed and press-room is of cast-iron. The press, of different con-
struction, extremely heavy, is said to give a pressure of 12,000 kilo-
grammes. The officer attending said it had been found that caps split
more, and were more liable to throw out fragments, when filled with
dusty powder, and that the great pressure used prevented a too ready ex-
plosion, and preserved the cap from being injured by moisture. Before
varnishing, some are tried by a test drop. A weight of one ounce falling
two and a half feet must explode the cap; but, if falling one foot, (a force
less than full cock,) the cap must not explode. The machine for varnish-
ing differed from that at Liège in making the receiver move instead of the
plate with its points. After varnishing, the caps, placed upon boards cup
uppermost, are removed to a drying-loft, where they remain four weeks exposed to a temperature of 30° centigrade. They are then packed in boxes containing 10,000. The cost of 10,000, labor and materials included, is said to be 21½ guilders—about $84 a thousand. Fulminate costs 8 guilders ($1 37½) per pound. 37 kilogrammes (82.65 lbs.) charge 1,000; 000. The prices above given are said to embrace a proper interest upon the expenses incurred in completing this extensive establishment. All the working-rooms are kept in the neatest order; the floors are carpeted and the workmen supplied with woollen slippers. Each workman has his particular branch, and he attends to nothing but that. A sergeant is master of each shop, and is obliged to be constantly present to see that the workmen act with proper care. No women or boys are employed.

Goossen's Cap Machine.—I was invited by the inventor to examine this machine, and state whether it had been copied from that in use with us, as some rival mechanician had charged. It differs, however, in some points, from any I have seen, and promises to work well when finished. The copper, in strips, enters the machine vertically, being fed in, by rack, at each end of a lever arm, to dies, cutting the star and forming the cap, (as with us,) the cutters attached to the ends of a swinging beam, moved by an eccentric, so that a star is cut and cap made alternately at each end of the beam, or one every half revolution of the crank. The punches act horizontally, and a piston pushes the finished cap from one matrix as the punch enters to form the cap in the other. This secures, as with us, a freedom from clogging, which seemed to annoy them greatly in the government machines: The inventor had conceived and partly matured a plan for combining the filling and varnishing operations with this machine, the only instance that I saw in Europe where the idea of such a combination seemed to have been entertained at all. He had presented his views, he said, to the officers of the Dutch artillery, but they had not been received with encouragement.

PERCUSSION CAPS—ENGLAND.

The cap factory is under the general charge of the colonel commanding the gunners' stores department, Woolwich arsenal; but the operations are conducted with those of pressing musket balls and preparing shells, in a special enclosure, which can only be entered (even by officers of the British army) in company with the officer in charge. Through the kindness of Colonel Dundas, I was permitted to accompany him through some of the shops. The machines for making the caps, and those for filling them, occupy two adjoining rooms; the mechanical and hand operations being more intermingled than in the continental establishments.

The sheet-copper of commerce is cut into strips, wide enough to cut four rows of stars, by machine shears; then passed through rollers; then fed by hand to the star-cutting machine, cutting two rows at once. The stars are then fed by hand to other machines, which complete the cap. They are then rolled in barrels with saw-dust to clean and polish them ready for filling. For this purpose they are placed upon plates containing twelve dozen holes, in which the caps rest. These plates slide in a space under the top of the filling table; this is a polished metal plate, fenced
around with holes corresponding with those on the others, and of a size to contain the exact charge for a cap; the bottoms closed by a sliding metal plate. The composition—a fine powder, not in grains—is spread with a wooden spatula upon the table, and the surplus, after filling the hole, is returned to the box; upon drawing the sliding metal plate to a stop, the mouth of each cap is uncovered, and, by a blow upon the table, the charge is deposited in each. The plate with caps then goes to the press table, where a pressure of fourteen pounds is, in turn, given to each row, the plate travelling by a rack movement, so as to bring the rows of caps under a row of pressing points moved by a hand crank. To varnish the caps, the plate is placed in its bed, upon another table, where, by similar machinery, each row is, in turn, brought into position to receive its proper supply from a row of points which travel from the varnish reservoir to this position, advancing the plate one row each return journey. When over the caps, the arms supporting the row of points touch upon stops with force enough to detach the drops of varnish from the points. The caps are allowed to remain in the plates a short time—15 or 20 minutes; each cap is then placed, separately, in the chuck of a small foot-lathe, and a rapidly revolving piston, having a reverse motion to that of the chuck, is pressed in the cap to harden and polish the varnish. After some days drying, they are placed in a second lathe and polished externally. (Occasionally I noticed that a cap would explode during this operation, as the boy pushed too hard with his polisher, but no further harm was done than the loss of the cap.)

The government does not make any fulminate, but buys it from a contractor on the Island of Jersey. The reason given for this was, that the department is thus saved the tariff charges upon alcohol, which enters free into Jersey. For use, the fulminate is mixed with chlorate of potassa and pounded glass; (to give bulk to the fulminate, a very small quantity of which is esteemed necessary.) Sulphur and nitre formerly used for this purpose are so no longer. The proportions are: 4 parts of fulminate, 9 of chlorate, 2 of glass dust. The chlorate is bought in commerce and the glass pounded by hand at the establishment. I was not shown the mixing room, but was told that the mixture was simply made upon a marble table, without danger; that no accident had ever happened. The caps are said to be invariably good, even after 24 hours' immersion in water.

The contract price of the fulminate is 25s. 3d. per pound, ($6.06.) Boys are chiefly employed. I saw but one man: he attended to mixing the powder.

Percussion tubes for cannon are also made here, composed of two tubes of quill. Chlorate of potassa, mixed with sulphuret of antimony, fills the smaller ones, which is fastened securely, at right-angles, with the larger, charged with gunpowder. Colonel Dundas stated that they found them excellent, both for the land and sea-service, and the cost is said to be very little. A specimen accompanies this. No friction tube has been introduced.

The chief peculiarities in the fabrication of the fulminating powder, by different nations, may be summed up as follows, and is interesting in showing how much labor, in handling, is avoided by our ingenious machinery;
French.—Mix by hand without pressure; sift by hand; dry by exposure to heated air, and charge, 52 at a time, under moderate pressure, using dust powder. Varnish by hand, one at a time.

Belgian.—Mix by machinery without pressure; sift by machinery; dry upon hot-water plates; and charge under a pressure of 10,000 kilos., using grain powder only. Varnish by a hand machine, 56 at a time.

Holland.—Mix by hand and then press into a cake, while moist, by machinery, under a pressure of 150 kilos.; dry by heated air; sift by machinery; again dry for two days, by hot-water plates, and charge, 56 at a time, under a pressure of 12,000 kilos., using grain powder only. Varnish by a hand machine, 56 at a time.

England.—Miximite purchased; mixed by hand without pressure; charged immediately, 12 at a time; using dust powder, under a pressure of 14 pounds only. Varnished by a hand machine, 12 at a time; again pressed by a spindle in a lathe; dry for a day and cleaned in a lathe, one at a time.

Note upon the explosion of about 200 grammes of fulminating powder at the citadel of Liege, July 24, 1849.

[Translation.]

"The 24th of July, at 9 a.m., the hopper exploded while they were engaged in charging percussion caps at the citadel.

"Work had just commenced, and there were nearly 200 grammes of powder in the hopper. By the force of the explosion, the cap-receiver (a machine of iron with cast brass sides and wrought-iron handle, pierced with 56 holes, containing 56 caps) and the hopper were broken to pieces, and projected almost all downwards with such force that they penetrated the ground to the depth of from 10 to 20 centimetres. Fragments of the
brass sides were thrown laterally to a distance of 200 metres. Some injury was done to the building.

"The thick sheet-iron plate (between the hopper-shed and press-room) preserved entirely, as was expected, the interior of the press-room, where were 17 workmen. Two bottles of varnish only were broken within the room by the concussion."

**SMALL ARMS—FRANCE.**

As our musket resembles much the French in dimensions and in the mode of welding the barrels, I thought it advisable to visit some of their armories, and examine the operations to see if the difference in cost reported (for their arms and that of ours) was due to the use of more economical means, or solely to the higher rates of labor and materials in this country. Upon application of our minister, Mr. Rush, I was furnished with orders of admission to Mutzig armory near Strasbourg, and to St. Etienne armory near Lyons. As I was informed that neither of these was entirely a government establishment, (the first being owned and conducted by a contractor who is paid a fixed price upon each finished arm, and the second in part owned and conducted by contract,) I afterwards visited Chattellerault armory—the largest in France—which is owned by government and conducted without the interposition of a contractor. The operations at all are under the control of the artillery, a director, a sub-director, and from 6 to 10 captains (en secondes) being stationed at each—the last for their instruction as well as for the assistance of the director in supervising the shops, and the course of work, and inspecting the rough material and the finished arms. A special board of officers at Paris is likewise charged with the minute examination (with standard gauges) of a certain number of arms from each manufactory each half year; and its report, as far as it concerns the work of either armory, is posted conspicuously in view of the workmen, to prevent the gradual introduction of any change in dimensions. A peculiar feature in the work at the French armories—producing, they say, a great economy in the price, and unobjectionable in all respects—is their mode of repairing defective barrels by plugging them. This is done at all stages of the fabrication as the defect is discovered—even in cases where barrels burst in the proof. One result of it is immediately noticed—the absence of the piles of rejected barrels generally to be seen at other armories. This plan, perfectly familiar in other kinds of iron work, has not been to my knowledge elsewhere applied to barrels; but there seems to be no practical objection to its introduction to some extent, if not to the degree practised in France. But few machines are used in any of their establishments, and these generally of old patterns. In boring, two or three different lathes are used for each barrel. With two, 7 boring-rods are used in the first and 9 in the second. The conical portion of the barrel only is turned; it is then finished by file and grindstone. A few milling tools are used at Chattellerault; but none were seen elsewhere. The breech is threaded, the breech-screw cut, and the vent bored, by hand-tools; this last operation without a fixed frame to support the barrel. At all the establishments the workmen furnish their own tools, and much of the work is done at the home of the workmen. A tariff establishes the price allowed for each operation, provided the part receives the stamp of the inspector; but by
the rules established at Mutzig and St. Etienne, (and it is believed Châtellerault also,) if a skelp is taken from the store, a good barrel (passing all inspections) must be returned for it, all defects being supposed to be produced in the workmanship; consequently, all the work lost by defects discovered in the course of fabrication has to be made good by the different workmen in whose hands it has been. The usual defects noticed in barrels—cross-cracks, cinder-holes, flaws, &c.—were observed at times in the French barrel; but the inspection is very rigid, and the finished barrel seems to be faultless. Stocks are supplied in the rough from the stores to outdoor workmen, the contractor being charged with its cost price, 1.90 fr. (35½ cents.). The dimensions of the shank of the bayonet have recently been enlarged in the vertical direction. They are now 16 mil. x 11.3 mil. horizontal diameter. Cones are made at St. Etiennes and Châtellerault, and sword bayonets at Châtellerault only, from whence the other armories are supplied. Although great care is observed to reject all parts not of prescribed dimensions, it is yet impossible to have the parts interchanged—each has to be fitted and marked for its own barrel and stock. The spare parts for repairs are not finished to exact dimensions at the armories. The peculiarities noticed at the different establishments, and the prices of materials of work, are given below.

**Mutzig.**—Iron is purchased in bars 1 inch thick, 2½ wide; about one foot makes two skelp—price of skelp 4.50 francs, (84½ cents.). In forging, the barrel receives from 60 to 75 heats, commencing at the centre and finishing at the small end. The seat for the cone is forged separately and welded in a slot cut to receive it. Barrels are proved in the presence of an officer; less than two per cent. burst in the proof. Cost of finished barrel 9 francs, (§1 69)—of bayonet, 3.45 francs, (64½ cents.). The stocker is paid 2.50 francs, (47 cents.). One stock per day is esteemed a fair day's work, but many of the men finish three in two days or four in three days. The finished gun is said to cost 32 francs; (§6 02.) Water power is used to turn the machinery. Forges *single,* with hand-bellows. About 16,000 new arms were made during the last year.

**St. Etiennes.**—Inspection offices and assembling shops in the village: about two miles from these are other shops—one large building with a steam engine attached, where are, in one room, boring and turning lathes, grindstones and emery wheels, and blowers cylinders (for the fires in the forging shops adjacent,) an inspection room for barrels and bayonets, an iron storehouse, a proyest house, and a damp cellar (the "salle humide,") where finished barrels are stored for thirty days previous to the final inspection. This plan is not continued elsewhere, but it is said to be the most effective means of developing defects in the iron, as the condensed moisture escapes from the defective portion long after the sound part is dry. Grindstones, it is said, are secured from bursting by embedding in the sides circles of iron 1½ inch wide by ¾ thick, let in with melted lead. One or two circles are used, according to the size of the stone—the smaller about 2 feet in diameter, the other 3½ feet. No stone has burst here since this plan was adopted. Bar iron for barrels costs 64 francs the 100 kilos., (§12 for 220 lbs.) Barrels are all finished in these shops; locks, stocks, mountings, &c., by outdoor workmen in the village, and sent to the inspection offices, there to be assembled. Muskets, as soon as they are boxed, are sent to Lyons to be stored. Packing boxes are very rough, and un-
planed. The cost of the finished musket is said to be the same as at Mutzig.

**Chattellerault.—** The armory is about two miles from the village, consisting of two ranges of shops; one, five in number, with a water-wheel to each, turning machinery within; the other for hand workmen and stores. Eight large four-story buildings of stone are also attached to the establishment, for quarters for the workmen and their families; 900 workmen are said to be employed here, besides many outdoor hands, (some of whom live as far as five leagues from the armory.) A large stone building designed for storing arms is now used for pattern-rooms, saddler's work (making belts,) filing and finishing light parts, &c., as the government has forbidden arms to be stored elsewhere than at the forts. In the pattern-rooms are kept samples of each article made, in each stage of its manufacture, showing the part done by each order of workmen, or by each different machine through which the work passes. The machine shops contain trip hammers, forges, blowing cylinders, lathes, drop hammers, and moulds for forming the cuirass, grindstones, emery wheels, and some few milling machines for parts of small-arms. Fourteen varieties of fire arms, four of sabres, two of swords, two of sword-bayonets, and the breast- and back-plates of the cuirass, with the implements for small-arms and the mountings for belts and slings, are made at the establishment—a variety of work which must allow of great economy of material under the system pursued. The iron necessary is purchased of suitable dimensions, the price a little greater than at St. Etienne. The steel is drawn under the trip hammers to the sizes needed for sabre and sword blades, and weighed off for each in a special balance. The rod, suspended in water, in a square tube, is marked at the point indicating the proper cubical contents (of the part immersed) for the kind of blade to be made. The forging is done by outdoor hands, the grinding and polishing in the shops. The cuirass is finished entirely at the shops. Alternate pieces of iron and steel, squaring 1/4 inch or less, are thoroughly welded together in piles under the trip; the mass is doubled and drawn out repeatedly, and then hammered into plates and rolled into sheets of proper thickness. These are moulded to form by drop-hammers. Three moulds are necessary for each. The edges are then hammered, and the plates finished on the grindstone. The use of the "salle humide," for depositing barrels after their completion, has been discontinued here, also the use of polishing machines; both changes, it is said, by the influence of the workmen. The grindstones in use are of artificial construction: the exact mode of preparing them is not known; but they are said to be composed of a mixture of sand, bitumen, and resin. They are about the color of pale redd sandstone, and of many varieties of fineness. The workmen spoke highly of them as cutting well, not wearing rapidly, and perfectly safe. They are on trial here, as an experiment, previous to their general introduction. A captain of artillery is charged with examining and reporting the details of their use. The usual number of muskets finished is said to be 1,800 per month. The cost of the musket here is said to be 34 francs, ($6 37.)

**Altering flint arms to percussion.—** This is going on very extensively at all the armories; about 69,000 were altered last year at Mutzig, and much larger numbers at St. Etienne and Chattellerault. Carbinles for the artillery are all altered à la tige, and generally at the last-named place. The rifling is done in a vertical hand-machine, the barrel held fast, and the tool
descending in a long brass-guide. In transforming the musket, the old vent is threaded and screw-plugged—diameter of plug before threading 4½ mil.; a second plug, 15 mil. at the small end and 20 mil. at the large, and 22 mil. long, is screwed in the top of the barrel, to form the cone-seat, and the interior excess of these plugs bored off by a hand-drill. The seat is then formed, topped, and bored, ready for the cone. The muzzle-sight (previously on the upper band) is brazed on the barrel in a slot, and a breech-sight tightly hammered in a similar slot, cut in the tang of the breech-pin. The barrel is then fine-bored to its new diameter of 18 mil., and then proved with a charge of 20 grammes and one ball. All barrels found defective upon a first inspection, or which burst in the proof, are repaired by piecing, as with new barrels; by preference the piece is attached to the butt-end when equally economical, and the small end cut into ferrules (for the screw-driver and cone wrench handles for the new carbines.) The plane of junction of the new piece is perpendicular to the axis, as in the welding of Treadwell's cannon. A barrel which burst in the proof at Mutzig in my presence, for the length of six inches, was sent to the forging-shop to be pieced, and the master-workman stated, that for 4½ francs (half the price of a new barrel) it would be made again, ready for the proof. Old stocks are scraped and oiled, the bands merely flattened a little to make them bind. Locks altered by removing the pan and filling up the bed with an iron plate; an extra notch is filed in the tumbler as "a cran de sinete," and a hammer replaces the cock. These changes cost only 5 francs (94 cents) per musket, where all parts are good; but I saw some muskets repaired where the lock needed several new parts and the barrel was pieced. Where arms to be altered are in the hands of troops, officers of the armories are sent to inspect and receive them, making a report of their condition; other altered arms are issued; no new muskets being yet in the hands of the troops.

New pattern fire-arms.—For many years efforts have been made by the French artillery to introduce the rifle principle into their system of fire-arms, under a form which should give the advantages known to be due to the grooved arm, with a forced ball, without the objections then belonging to that principle, viz: a difficult and slow mode of loading, and a ball deformed disadvantageously upon leaving the gun—objections esteemed sufficiently powerful to abolish, for a long time, the use of grooved arms in the French service. A certain step had been gained as early as 1828 by the invention of M. Delvigne, who, by making a chamber for the powder of a less diameter than the rest of the bore, and (later) by using a cylindro-conical ball, succeeded in reducing the difficulty of loading, and in gaining accuracy with small charges, but with a loss of force to the ball for long ranges. Continued trials since, producing, step by step, modifications in the grooves of the bore, the form of the ball and the rod, resulted in the adoption and introduction of a carbine in 1840, which was placed in the hands of a special corps, styled the Chasseurs d'Orleans. The services of this corps in Africa proving the superior range and accuracy of their arm, induced the artillery to apply the principle to its carbines, and afterwards to the infantry musket. The essential difference between this arm and grooved arms previously known is, in having a stem of small diameter attached to the breech-pin in the axis of the bore, upon the end of which the ball rests in
loading, and then (by the usual number of blows for smooth-bored arms) with the rammer it is easily made to fill the grooves of the barrel, without essentially altering the shape known to be best to secure to it velocity and a rotary movement in the direction of its longest axis. This idea is said to be due to General Thouvenin; but the details of the dimensions for the stem, the grooves, the ball, and the sights, have been established, after long trials, by Messrs. Tamisier and Minie, officers employed at the school of practice-firing at Vincennes. I do not think that the plan is yet considered so free from practical objections, as to secure its general introduction for all arms. The French officers, however, always speak of it in the highest terms, and the services of the Chasseurs have been invariably mentioned with eulogy upon their arm in Algeria, and recently at Rome.

In Belgium and Holland I found that trials had been made with it, confirming, in a measure, the French reports of its superior accuracy and range. It is certainly advantageous for some corps; and in Belgium and Holland they propose arming the foot rifle corps only with it. In Belgium its fabrication has commenced. The results said to be obtained from the short artillery carbine, in France, commend it especially for that arm, now so inferior to the musket. The stem is a cylinder of steel, tempered at the end upon which the ball rests, and screw-threaded at the other end for a length of 1 centimetre; the diameter .009 m., and the height above the breech .038 m. The barrel has 4 grooves, with the inclination of 2 metres in one revolution; breadth of groove 7 mil.; the depth varying from 3 mil. at the breech to 1.5 mil. at the muzzle of the musket. A special hausse, with a hinge joint, is attached about 4 inches in front of the cone, admitting of three fixed sights, and with a movable slide for higher elevations, (graduated in the Chasseurs' carbine to 800 metres.)

General Tournemine told me that the altered musket had been fired at 1,200 metres, placing 66 balls in the butt in the 100; the carbine the same at 800; and the artillery carbine (having only 2¾ inches' length of barrel) placed 56 per cent. in the butt at 400 metres. Far inferior results would commend strongly the introduction of a principle which secured them. The shape of the ball (every line of which is said to have been established, as it now is, upon special trial) can be best judged of from the one presented herewith; its weight is 47.5 grammes (1.67 ounce.) The service charge for the musket is 4.5 grammes, (for the artillery carbine, 2 grammes less;) for blank cartridges, 7 grammes are used. As 6.30 grammes are necessary to fill the space around the stem, the charge of 7 is ordered, that the rod may never touch the stem in loading. The vacant space between the powder and the ball secures room enough for any ordinary accumulation of dirt in long-continued firing, and no injury has resulted from it to any of the arms tried. Ball cartridges are made with an extra piece of paper, forming a cup, to contain the powder; the ball and this cup are then enveloped in the ordinary folds of the cartridge-paper, and the ball end dipped in grease. In loading, the powder is poured into the barrel, the ball inverted, and inserted in the bore, all the paper torn off and thrown away, and the ball rammed home; six cartridges are bundled together, (with eight caps, in a special cylinder.)

In the alteration of old guns to this new plan, at first the barrel was cut off in front of the vent, and a new piece, (of a length to contain the charge, and with the stem attached to its breech-pin,) of greater strength than the
original, was attached, by screw-thread, to the barrel. This was found to be unnecessary upon trial, and now a stem of proper size is merely screwed into the original breech-pin, and the old barrel grooved, as above stated. All artillery carbines are to be so altered, all the regiments of that corps being armed now with the altered arm. Two regiments of infantry, stationed at Metz, are armed with the altered musket; and I understood that the further alteration of muskets had been suspended until the reports of a long practice in these regiments had established the suitableness of the arm to infantry service. The officers at Metz with whom I conversed stated that, up to that time, the trials had been favorable. A special drill has been published for this arm, containing directions for teaching the appreciation of distances and the use of the sights; a copy of this I have brought with me.

To avoid the necessity of using the stem, a recent proposition has been made to use a ball charged at its lower extremity with powder, (percussion, I believe,) which, exploding with the charge of the gun, would swell the circumference of the ball sufficient to fill the grooves of the barrel. General Tournemine, a member of the committee of artillery at Paris, told me that experiments with this ball before the committee had been perfectly successful, and showed me the cartridges proposed for each arm. He stated that further experiments were to be commenced at the school at Vincennes; the result of these I have not heard. The cap for each cartridge was conveniently carried in the hole in the ball, on the top of its charge.

The carbine made in Belgium (and proposed to be introduced) differs from the French in the grooves of the barrel being only 5.6 mil. wide and 3 mil. deep. The price is said to be 60 francs. Trials were in progress at the armory at Delft at the time of my visit. The gun was fired from a rest—the distance from the butt 800 metres—at which 48 per cent. of the balls struck the target.

In connexion with the subject of small-arms in France, I will notice the novelties exhibited at the national exhibition at Paris in this branch. M. Delvigne proposes a tube for practice, to be applied to the interior of the musket or cannon, with a view to economise the expenditure of ammunition while teaching the use of these arms in service. The tube for the musket has a bore of the diameter of our backshot, and fits in the bore of the gun. A mark on its end shows when the vent of the tube is opposite the vent of the gun. For cannon the tube is of brass, to the length of the same number of calibres of its bore as the gun has, in terms of its calibre. This brass tube has arms of iron extending to the muzzle, by which it can be drawn out to be loaded. Aiming by the usual method (as the shot is placed in the axis of the piece,) it will depart, he says, under precisely the same circumstances as when the full size shot and charge are used. A Mr. Buvers exhibits the shank of a bayonet finished by machinery. He states that he can furnish bayonets of the French government model by the use of his machines (which are not shown) 3s sous cheaper than the government now pays. Berger of St. Etienne exhibits a musket-lock for the government musket, where the number of parts is reduced to three. This ingenious and simple arrangement seems to be as strong and solid as it is simple. Its external appearance is the same as the present French musket-lock; the same lock-plate, indeed, could be used; the present side-screw, no longer necessary, would not be in the way; if
reversed. Reversing the existing action of the lock, (where the tumbler is attached to the hammer, making necessary a sear-spring to equipoise the pressure of the main-spring upon the nose of the tumbler,) to the hammer is attached a piece, acting as the sear; and the end of the main-spring has on it the notches usually on the tumbler. The upper arm of the spring has on the end a projecting point working in circular slot in the hammer, which steadies it against the pressure of the lower arm. Thus the hammer, spring, and lock-plate form the lock. The usual tumbler-screw prolonged holds the hammer upon the lock-plate, and attaches the lock to the stock—the front of the plate being held by the head of a fixed screw, as in the present French musket. On the outside of the lock-plate is a cylindrical projection, upon which the hammer fits. Through the centre of this, the side-screw passes. On the inside of the plate, the main-spring is attached, about the centre of its length, by a pin, and its lower arm bears upon a fixed stop on the plate to stiffen it. The exterior surface of the hammer is as at present; on its inner face is a circular projection, centering with the cylinder on which the hammer turns, and revolving in a bed in the lock-plate, of a depth equal to half the thickness of the plate. Near the outer edge of this projection is screwed permanently the piece acting as sear, which works in the notches on the end of the main-spring through a hole in the lock-plate. A groove in another part of the projection allows the projecting point on the end of the upper arm of the spring to work in it, passing through a cut in the lock-plate also. These two cuts in the plate are covered by the hammer. A reference to the accompanying sketch will best explain the plan. The hammer can be taken off when drawn to its full height, without the use of a spring-vice, thus effecting another economy in dispensing with this. With the hammer off, the lock can be thoroughly cleaned. This suggestion, due to an apprentice boy at St. Etienne, seems to me to have many merits to commend its introduction. I understood, from the exhibitor, that it was under trial before the committee of artillery, but I have not heard the result.

Goossen.—An ingenious lock for small-arms (sketch No. 2) has been made at Delft, and is said to have been fired more than 1,000 times without a failure. The lock consists of but one piece—a spring—(acting also as the hammer;) the cone is in the axis of the gun, on the breech-pin; the trigger forms part of the spring. One end of the spring rests in a notch forged under the barrel; by pressing down the other end, the trigger notch catches on the guard-plate; by pulling back the trigger, the spring is released and the cap fired.

The third sketch annexed explains a proposed alteration in the percussion hammer.

SMALL-ARMS—BELGIUM.

A national armory has recently been erected at Liège upon a square of the town. It is a neat, commodious building; but, as yet, has not been extended as much as is proposed. The front (and main entrance) forms a hollow square, with a steam-engine in the centre of the body of the building, and shops and offices in the wings. Several machines of similar pattern to those in use with us are used in the fabrication, and the commanding officer, Colonel Timmerhans, (whose publications upon ar-
The artillery have made him well known to us,) is desirous of extending the use of them. Among other machines is one for turning stocks, (the only one I saw in Europe;) but, as yet, they have not been able to make it perform well. The course of the fabrication resembles much that followed in France, (with newer and better machinery, and a few more milling machines)—much of the work being done by outdoor hands. A large portion of this establishment is devoted to the practical instruction of young lads, enlisted for the purpose of fitting them to repair arms in the regiments. All parts of the work are in turn taught to them, under the instruction of masters who rank as non-commissioned officers. Here, as at the French armories, the workmen are obliged to remedy all defects which are found in the barrel in the course of inspection. Many of these defects are worked out by re-heating and upsetting—the barrel being forged very long with this object: scarcely one, the foreman said, being free in its whole length at first. As they have not followed the French plan of piecing, there is an ultimate loss in barrels of from 10 to 15 per cent. The Belgian iron is esteemed to be peculiarly tough: as a proof of this, the Colonel told me that, besides the ordinary proof of two fires given to every barrel, some are selected from each month's work for proof à outrance, and fired with half the weight (of the ball) of powder, and a gradual increase of the number of balls; and that generally they endured to 7 balls. It is very rare that one bursts in the ordinary proof. The breech-pin is made with a notch in the square end, which fits into a piece fastened to the stock by the tang screw, so that the barrel is taken from the stock without loosening this screw. The cost of the finished musket to the government is said to be 32 francs. Cones are made by Mr. Fabissé at 3 sous apiece. His machines for finishing them will be described in another place. There are two machines in use for making pressed balls—one vertical, and the other very similar to that at Washington arsenal, except that the press worked horizontally. This last seemed to do its work very well.

Altering flint muskets.—Two modes have been pursued: by the first, the hole for the cone is tapped in the metal of the barrel, crowded up with a cold chisel; the other operation is the same as described for the French arms. This plan is said to have cost only 2½ francs (47 cents) the musket. By the other mode, which is followed now, a large piece for the cone seat is brazed on, extending over and resting upon the lock-plate, the plug for the old vent passing through this piece; by this plan (the other operations being the same as above) the cost is said to be 3½ francs (65½ cents.) No reason was given for the change except that it made a better finish.

Colonel T. has made one of the new Prussian muskets, loading at the breech, and having the percussion powder in front of the powder of the charge. He said he found it to be extremely difficult to make, and very costly. He was kind enough to allow me to have a copy of his drawing of it, and one of the balls, which he was preparing for trial. They are submitted with this report. The weight of this new arm is 5.160 (11.37 pounds) without bayonet, calibre 7.1 mil., with 4 grooves in barrel. The reports from the seat of war in Baden, in July last, spoke very favorably of it.

At Liège are many large private establishments, making arms for commerce and for the smaller European States. In company with an officer of the Hesse Cassel artillery, I visited one of these, where muskets are made for his government at a contract price of 40 francs ($7.50) apiece. This officer
is required to superintend every part of the process, and he has with him
an inspector to inspect and stamp every piece before receiving it. The
guns seem neatly made and well-finished, being quite equal in these re-
spects to any I saw. The parts, however, do not interchange, the gauges
allowing considerable room for differences. Their lock is similar to ours,
with two side-screws; mountings in brass. The breech-pin has a large
shoulder at the end of the screw, forming, when the pin is in, a con-
tinuation of the barrel 3-16ths of an inch long; a part of the scollop of the
cone-seat is cut in this. The work is generally done by hand out of the
establishment, and brought there for inspection and assembling.

Among the arms made for sale were pocket pistols with iron barrels, with
bullet moulds, price per pair 3½ francs, (65½ cents;) and with brass bar-
rels, same size, three francs. Horsemen's pistols, with iron barrels eight
inches long, 10 francs (§1 88) the pair. All barrels made at Liége must
be proved by the government officers.

SMALL-ARMS—PRUSSIA.

There are said to be five armories in Prussia; two of them, Spandau
and Potsdam, in the neighborhood of Berlin. At the first the barrels, rods,
and bayonets are forged, and in part finished; thence sent to Potsdam to be
completed and assembled. There are at Spandau but few buildings; gen-
erally old and dilapidated, with a few machines of old patterns, driven by
water-power. The work is done by a contractor, under charge of officers
different corps stationed there in rotation. During my visit the officer
present was a lieutenant of cavalry. Barrels are welded by hand, and
also by trip-hammer. These last are said to be generally more defective
than those welded by hand,—about 10 per cent. are reported as lost. A
good barrel must be returned for each skelp, at the expense of the work-
men, unless the defect is reported when the skelp is issued. The skelp
is said to cost 50 groschen, (§1 15;) finished barrels, 3 thalers, (§2 21 ;)
and the musket complete, 11 thalers, (§7 62.) Ten heats are given in
welding a barrel under the trip, and 50 under the hand-hammer.

It is said that several thousand men are now armed with the new musket;
but it is not exclusively in use. The place of its fabrication, as well as
the details of it, seem to be kept secret.

SMALL-ARMS—HOLLAND.

The national armory is at Delft, at present but a small establishment.
A steam-engine has recently been erected, and they propose its immediate
extension. Barrels are now made by contract at Liége. They are deliv-
ered at Liége, (bored and rough-turned, with the cone-seat welded on, but
not dressed,) at 3½ florins, (§1 40.) The rest of the work required is done
by hired labor in the government shops. Hammers and plates are swedged
and finished by hand. Some few turning lathes and a horizontal polish-
ing machine, at present, are the only machines. During my visit, the
chief work was in altering flint-arms. By the plan adopted, a piece of
iron two inches long is brazed on the side of the barrel; the brass pan is
sawed off even with the lock-plate, and this piece dressed to fit in the pan
and on the edge of the plate. The plug for the old vent passes through it.
The cone-seat is not in this piece, but is crowded up from the metal of the
barrel. The new lock-plate of iron is made of the shape of this lock-plate, as altered, and the new barrel so as to conform to the altered barrel. Cones are bought at Liege all finished. It is said the alteration of flint arms costs 5½ francs each, ($1 03½, ) and the new musket from 37 to 42 francs, ($6 94 to $7 87½. ) The best finishers receive from 2½ to 2½ francs (42½ to 47 cents) per day. The shops are lighted with gas, and 11 hours work a day always required. They have one room in which are pattern arms of different European nations; among the rest a transformed Austrian musket. The flint is replaced by an iron nose fastened in the old cock. The percussion powder is contained in a tube, which is tied to the cartridge for transportation, and inserted in the vent as priming, the end projecting into the pan. To fire, the pan cover is thrown open, and the iron nose strikes against the tube in the bottom of the pan. If the percussion cartridges are exhausted, the old method of the flint-lock musket is again resorted to, changing the iron nose for the flint. This plan, the officer said, was still followed in the Austrian service. Several tubes tried in my presence (which had been made several years) failed to explode.

The musket stocks at this armory are finished entirely by hand. The workmen are allowed two and a quarter francs (forty two and a quarter cents) apiece; most of them finish more than one a day. If the work is not made exact to gauge, the piece is not necessarily rejected, but a proportionate deduction is made in the pay for the work. A director (a captain) and four other officers are stationed at this armory.

The tumblers have but two notches—the half-cock being low enough to prevent the cap falling off.

The cavalry carbine has a loop trigger, well guarded from the danger of being caught and pulled accidentally.

The Chasseurs' rifle is grooved with six grooves, and the ball is forced by blows on the rod with a mallet, carried for this purpose.

**SMALL-ARMS—ENGLAND.**

Birmingham is the chief manufacturing place of smooth bored arms, and is, I believe, the only place where the barrels are welded under rollers. The national establishment at Enfield (where rifles are made and flint muskets altered) has not yet, I understood, introduced this mode of welding. As the orders of the department could be fully carried out by visiting the extensive private establishment at Birmingham, I did not think it necessary to await in London the return of our minister, to apply for permission to see the national establishment, as it is said to be conducted upon a smaller scale. An officer, styled the "inspector of small-arms," having his office at the Tower in London, goes each month to inspect and receive the finished work at Birmingham, and all arms passed by him are stamped "Tower," although no arms have been made there (at the Tower) for many years.

The buildings owned by the government at Birmingham, styled the "small arms inspection offices," are principally used in inspecting the various parts of the arms, after delivery by the different contractors, and also the finished arm, after being "set up" by another contractor who undertakes this branch. A steam engine is attached to the building, moving some few machines, by aid of which the vents are bored, cone seats milled, and in part finished; cones fitted, hammers capped and centred in the nose, and bored and fitted to the arbor of the tumbler; this arbor turned,
and a pin hole bored and pin driven in to fasten together the two, (so as to prevent the necessity of squaring the hole in the hammer, as with us.) Those operations are completed by government workmen, generally boys.

A proving house and a rough stock shed are also attached. No fastening process is used in seasoning.

The course of the manufacture is as follows:

Barrels, made by contract, finished, (except as above stated,) and delivered for proving, are, after inspection, fired one charge with one ball and one ounce of powder, using a proving breech-pin with the vent drilled in the axis. If it endures this proof it is finished, as above, in the government shops, and with its proper cone and breech-pin fired a second time, with thirteen drachmas and one ball. If the barrel endures these two without injury, and is entirely free from surface defects, it is received, and the contractor is paid 12s. 6d. ($3.)

Stocks.—Rough stocks are purchased in France, by a resident agent, and inspected before payment by a special inspector. They are sent to Birmingham and Enfield and stored in sheds; with lattice-work sides, for seasoning. The "setter up" is charged 3s. for the rough stock; if it prove defective in the course of fabrication it is exchanged, but nothing is paid for the lost work, by the government. This has to be made good by the foreman of the inspection office, who receives a per centage upon every musket received by the small-arms inspector, to compensate him for defective parts received from contractors, by himself or his assistants, (the government requiring a musket complete, to show for every issue of parts paid for.) The setter up, receiving the rough stock and parts, (only so far finished, as before explained, in the government machines,) has the musket completed at his own shops or by hands employed by him; returning it twice for inspection to the officers before the last operation (browning the barrel and bayonet shank) has been performed. He receives 12s. 9d. for his part of the work, and for letting in the barrel and lock merely 3s. 9d. additional for the stocker.

Small parts.—These are contracted for separately, to be delivered in the condition required, at the offices, bayonets, rods, and cones included. The total cost to the government of the first-class arms, (a strong, substantial arm, but of an inferior finish to ours,) is said to be from 60 to 64 shillings ($14.40 to $15.36.) A second class musket, made for issue to the militia, called "extra muskets," are said to cost 58 shillings, ($13.92.) These are subjected to less rigid rules in the inspection. First-class arms are stamped "Tower," below the hammer, about the centre of the lock-plate. Extra muskets have the same word on the butt end of the lock-plate.

Welding barrels —The government does not prescribe the mode of making the barrels, only requiring that they shall be free from prohibited defects, be of proper dimensions and sustain the prescribed proof. The contractors finding that they can make the barrels stronger and more free from defects by rolling, have adopted this method; they say it is not less costly than that by hand welding, except in turning out the work more free from blemishes, and especially in avoiding cross-cracks, which they think are produced in hand-welding. The iron, they think, is improved in the course of fabrication, but they still find it necessary to use only the very best for government work, paying for it the highest price, £23 per ton, rolled. The iron is furnished five inches wide by seven eighths thick, in lengths of about twelve inches, weighing ten pounds. The
pieces, heated in a furnace to a bright red heat, are passed first through rollers with three grooves: the first bending the plate in the centre lengthwise, and the second and third bringing it to a cylindrical form. After preparing a sufficient number of these pieces, the same party commence the welding operation. At the establishment at work during my visit, this party consisted of four boys; one tending furnace, taking out and putting in the cylinders: a second received the cylinders from No. 1, and inserting the spindle, passed it to the rollers: a third, on the opposite side of the roller to No. 2, received the cylinder and handed it over the rollers to No. 2, to be re-passed, or to No. 1 to be re-heated, straightening it if necessary, on the straightening board at his right hand. No. 4 aided No. 3, and receiving the finished barrel, straightened it in the machine for that purpose, carried it off and piled it. The rollers contain for making the government barrels, three circular and two conical grooves. (As a great variety of sizes of barrels are made by these manufacturers, the rollers in use contained many more conical grooves, not used in government work.) On the right, facing the rollers, is a water tub, and attached to and in front of them an iron rest, about four feet from the vertical plane, passing through their axes, and at the height of the top of the lower roller. This rest is composed of two parallel bars, one inch square, separated three and a half inches, but in the same vertical plane, and fastened firmly by iron arms to the frame of the rollers. Seven spindles are used. The spindle consists of handle, guard, shank, and point. A movable guard-plate, six inches in diameter with a hole in its centre, is passed on to the spindle before using it, and is transferred from one to another. The length of handle six inches, and from guard to point the same distance as from the front of the iron rest to the vertical plane through centre of rollers. The point is of steel one and a half inch long, and ranging from one and a half inch in diameter in No. 1 spindle, to four tenths diameter in No. 7 spindle. In the work the point is the only part of the spindle which comes between the rollers, (the guard-plate, supported by the rest, preventing the spindle from being drawn through with the cylinder or skelp. This is, therefore, pulled off from the spindle by the revolution of the rollers.)

The cylinders having been prepared as stated, and placed in the furnace, three or four at a time, when one is at a welding heat, No. 1 workman draws it to the furnace door, No. 2 inserting the end of the largest or first spindle into the cylinder, lifts it up, and, by jamming it against the iron plate side of the furnace, forces it on to the spindle, until the end of the point is even with the end of the cylinder; he then takes it to the rollers, passing it through the opening in the rest, and bringing it opposite to and entering the first circular groove, the line of junction of the edges of the skelp vertical. No. 3 receives it on the opposite side with pincers, and handing it to No. 1, is ready again at his place to receive a second one, which No. 2 has prepared to pass through in the same way. After the second welding heat, No. 2 inserts No. 2 spindle, (with a smaller point than the first,) and prepares to pass the cylinder through the second circular groove of the rollers. This time he places the junction of the edge horizontal. No. 3 now receives it, the weld complete, and the cylinder about fifteen inches long. The subsequent heatings are never above a red heat, and the object of the rolling is to lengthen the cylinder and give a conical form. With a third spindle it passes through the third circular groove,
and is lengthened to about twenty inches. After the fourth heat, the fourth spindle is inserted and the cylinder is held ready to enter the first conical groove. No. 2 watches as the rollers turn, until the shoulders, formed by the junction of the large and small ends of the cones grooved on the two rollers, are about coming together; he then pushes in the cylinder, and its end is caught by No. 3 on the other side, who supports it as it comes through; and handing it over the rollers, No. 2 inserts again his spindle, and again passes it through. No. 3 receiving it, straightens it by two or three hits (slaps) upon an iron plate (near the ground on his right hand, when facing the rollers,) and hands it again to No. 1 at the furnace. The same conical groove is used for the fifth heat, and spindle No. 5, the barrel becoming longer with a smaller bore. The sixth and seventh spindles inserted after the sixth and seventh heats, and the second conical groove is used. The barrel is passed in all about ten times through the rollers, receiving seven heats, (the two first only being welding heats.) It is now of nearly finished diameter, excess about $\frac{1}{2}$ of an inch, with slight excess of length, and a bore of $\frac{1}{16}$ of an inch. While hot from last heating, No. 4, who has been assisting No. 3 during the previous operations, inserts a spindle in the barrel and takes it to the straightening press, the lower table of which is fixed, while the upper one has a lifting and falling motion. No. 4 turns the barrel on its axis until it is quite straight, taking care to move the spindle occasionally to the right or left. The jaws of this press are nearly of the length of the barrel, and have conical grooves suitable to the shape of the barrel in the direction of the length. When quite straight the spindle is drawn out and the barrel carried to the pile. The cost at this stage is about 5s. ($1.20,) and one hundred barrels a day for four boys and one pair of rollers are a fair day's work; but eight hundred in six days can be made when the hands are practised and the rollers in good order. From the furnace room the rolled barrels are taken to a hand-forgé, cut to the proper length and the ends squared, and the cone seat welded on; then bored, turned, and ground breech pin made and fitted, sights and studs brazed on, and then polished ready for delivery. If received, the government pays 12s. 6d., as before stated. The contractor says that the iron is so much improved in resisting power by this process, that the average loss in proof, firing with the large charges used, is only two or three in one thousand; and frequently, not one in a thousand delivered bursts. Not over ten per cent. are lost for any cause; whereas, formerly, fifty per cent. were rejected in the course of the different inspections. Great care is requisite in rolling to keep the spindle evenly in the centre. Twenty-seven in the one hundred burst in one proof, the day before my visit, of a lot of fowling pieces, owing to the metal being too thin on one side. Though much pleased with the use of the rollers, the manufacturers speak of them as being very troublesome, requiring frequent turning to sharpen the grooves. A large lathe of common construction, with cutters of steel of exact size, is kept exclusively for this purpose.

The largest diameter is about fifteen inches; screw-compressors attached to the top of the roller, permit an easy adjustment. No. 2 would turn the screws occasionally during the work, as he found it necessary. This company makes cheap barrels for foreign markets, all finished at 1s. 9d. apiece. I saw barrels making for the East India Company, short smooth bore, for which they received 16s. apiece. These are to be grooved in London.
The machinery for rolling barrels was invented by a man now dead, whose patent expired before he could succeed in introducing the plan. Since, Mr. Clyde has perfected the arrangements and has been able to make it work well. He is now the largest manufacturer in Birmingham. He says that the government has ordered but little work this year, as some change of model is said to be in contemplation; last year, however, he had work enough to keep three pairs of rollers at work in Birmingham, turning out an average of three hundred barrels a day. Other rollers in the neighborhood were also employed.

Stocking machines have been made and put up more than once in Birmingham, but the stockers have always succeeded in preventing their adoption.

The parts of government arms cannot be interchanged, and the general neatness of the work is not superior to that of French arms, as less rigid rules are followed in the inspection. Our own, in this particular, are quite equal to the best I saw.

**Altered arms.**—The cone seat is brazed on the barrel and the bed of the vent filled up with iron. Other changes as usual. Last year the arms were altered by contract at 13s. 6d. apiece. At present, I understood that all work of that kind was done at Enfield.

I saw at a private establishment here a plan proposed for locking the trigger to prevent its pulling down the hammer, if accidentally touched: a wire rod (one end of which locked the trigger, preventing all motion) extended along the stock to the usual position of the left hand in aiming. By pressing back this hand a little the rod was moved back, and the trigger, unlocked, could be pulled by the right hand. As it is necessary to push back with the left hand, while pulling the trigger with the right, an accidental discharge could hardly occur. This principle has been applied much to sporting-arms.

**ARSENALS, FOUNDRIES, LABORATORIES, POWDER WORKS, &c.**

The report of the board of officers who visited Europe in 1840 gives so correct and satisfactory a description of the most important of those establishments in Europe, that nothing remains for me to say (after stating the few improvements made since their visit) of those noticed by them. Some details of the smaller establishments not visited by the board may prove interesting, as they all have some peculiarities striking to the eye of a stranger.

At Metz and Strasbourg, in repairing and making field carriages, a band of iron, three mill. thick and seventy-six wide, covers the junction of the two pieces forming the stock above and below, to prevent the introduction of water in the joint. It is secured by nails, and (at the ends) under the elevating screw box and lunette ring-plate. Old carriages, after a few years' service, are found to be much decayed at this part. Shoes are to replace the lock-chain in all siege carriages. Battery wagons have open slat sides and a pent roof, covered with a tarpaulin on the march. There are none made like ours. At Metz, the engineers have an arsenal for the manufacture of sappers and miners' tools, sappers' cuirasses, and helmets, &c. Wagons and harness for the use of this corps in the field are also made here. The tools are boxed in sets, and the wagon bodies made to
contain a certain number of each kind of boxes. The wheels and harness are similar to those of the field artillery. This is the only establishment of the kind in France; a similar one has been established in Algeria. The workmen are enlisted men; a company of drivers is also attached to the corps. Immense quantities of engineer tools are on hand; and in one room (where are arranged the busts and portraits of distinguished engineer officers, with the dates of the different sieges they conducted) the walls and ceiling are curiously ornamented with trees and flowers made of shovels, axes, picks, &c.

The powder works at Metz, conducted as at Le Bouchet, (described in the report of the board of officers,) have, of late years, been greatly improved—new one story stone buildings replacing the old wooden structures. These are placed in two rows about 100 feet apart, and the buildings about the same distance from each other. It is intended to remove near them the pounding mills, and bring by canal the water to the new spot—the present mills being considered dangerously near the houses of the city. No accident has happened here for twenty years.

Cannon foundry at Strasbourg.—Sand-moulding has recently been introduced, and with results highly satisfactory to the officers, who stated that, judging from the recent casting of two 24-pounders and three field pieces, by this method they would be able to effect a great economy in the cost of the guns without injury to the quality. The character of the metal of guns made here is of the highest order, of very even grain, and free from blemish. No new machinery has been introduced, and the director thinks that the government will not long continue the foundry here, as it is thought to be too near the frontier. The present price of brass guns is said to be 2.45 francs the kilogramme, (22.45 cents per pound.) Recent experiments before the commission of artillery at Paris, have shown that, with the elongated cartridge and an occasional charge in the length of the wad, French brass 24-pounders will endure 3,000 rounds with service-charges. Four guns tried were not unserviceable after this proof. They are finishing under an order, for trial, a number of heavy pieces of wrought iron recently made at St. Etienne. Two 10-inch mortars, one 24-pounder, one 16-pounder, and one 32-pounder howitzer have been ordered. A 16-pounder, previously tried, endured a great number of rounds; but a 24-pounder burst, after a few hundred, into many fragments. The officers do not seem to be in favor of wrought iron, as, they justly say, to be of advantage superior to bronze guns, (enduring as theirs now do,) they must endure more than 6,000 rounds, and only cost half as much per pound, as they cost four times as much labor to finish. Russian copper and English tin are used for the bronze guns. They have recently purchased more than 200 of their own old guns (taken in action) from the English, for re-casting. They employ many laborers about this establishment and at the arsenal at one franc per day, and well-grown boys at ten sous.

In examining the timber sheds at the arsenal, I was shown logs with two and three rows of sap wood enveloped in the good wood. The captain in charge of this department, who has had a great experience in timber, states that this is frozen wood, and that by counting back the circles towards these dead parts as years, these parts mark years noted for the coldness of the winter. For example, the years 1793 and 1828. He
calls this, therefore, frozen timber, and always rejects it. Logs are sawed into carriage timber by hand at Strasbourg and Lyons, and by water powder at Metz arsenal. Strasbourg is the chief station of the artillery. Three regiments were there at the time of my visit—(one the 15th, or pontoniers.) Practical and theoretical instruction is given to the men. In the polygon every year extensive field batteries are erected under the rules established for actual service. Large details of officers and men are daily made during the summer for such duty, and afterwards for firing at the butt. School rooms are sustained for the men and non-commissioned officers. Quite an extensive course of study is given to the last—embracing mathematics, grammar, geography, the principles of the sciences of artillery and engineering, and instruction in right line and pen drawing. Many very handsome specimens of their advancement in this branch ornament the school rooms. A very high degree of instruction is given upon the anatomy and care of the horse. Besides the usual skeletons and specimens of good and diseased limbs, &c., a very curious and interesting model, showing the entire organization of the animal, with the veins, nerves, muscles, bones, &c., as in life, (and offering a true view of every part, and of its mode of action and use,) has recently been purchased at a cost of 5,000 francs, merely for the instruction of the non commissioned officers of the artillery, all of whom are, in turn, stationed here with their regiments. The privates are taught grammar and arithmetic, and the simpler principles of their branch; by officers and by mutual instruction, under charge of a non-commissioned officer. An extensive and valuable library, liberally supplied by the government with new books as they appear, is open daily to officers. Reading rooms for non-commissioned officers and men adjoin it.

Fourteen regiments of artillery, of sixteen batteries each, and one regiment of pontoniers, are now in service. Officers (after two years' study at the polytechnic) assigned as eleves to the artillery (with those assigned to the engineers) are sent to the school of artillery and engineers at Metz; after two years of study here, they join their regiments, remaining until promoted captains "en seconde," (the grade of our first lieutenant.) They then are sent generally to some one of the artillery establishments, arsenals, armories, foundries, &c., to remain until again promoted as first captains; they then go to their companies, or remain as sub-directors at the establishments. Those remaining are generally expected to succeed to the command, and would not probably again join their regiments, as their experience is considered essential in the management of their special manufactory. Promotions are made throughout the fifteen regiments, and the officers are interchanged, at times, to familiarize them to the different duties as pontonier and artillery. The officers of the companies of the train are generally promoted from worthy non commissioned officers. They have no promotion with artillery proper, and are always subordinate to them when together on duty.

The storehouses contain large supplies both at Metz and Strasbourg; among the rest, about forty batteries of field artillery complete at each. No process of seasoning, other than storage in open sheds, is now approved of for gun carriage timber. Navies are found to split less, if the block has been immersed in water for some years before working. This plan is followed, therefore.

Sub-officers on duty at the arsenals are assigned to the charge of shops,
or of storehouses, and the care of material, each supply of which must be inspected by a board.

At Lyons a new arsenal has recently been constructed, intended as a supply arsenal to the army of the Rhine and to the corps operating in the Mediterranean. The general plan is a continuous building, enclosing two courts, with large smiths and carpenters' shops (detached) in the interior of the first court. It is very extensive, and the buildings, though differing in height, are of uniform architecture. At present one portion is occupied as barracks, and many large rooms are devoted to the making of musket cartridges by the men of the regiment stationed there. The store-rooms for tools, iron, &c., are very neat and well arranged. The principal operations at present are, in the repair of carriages and in sawing timber for storage, and making iron work for new carriages. No steam engine has yet been erected. The heavier pieces of iron, axletrees, pintle-hooks, ring-plates, and elevating-screws, are furnished all complete by contract.

The laboratory is within Fort Lamotte, in the neighborhood of Lyons. The buildings in use are temporary wooden sheds. An immense amount of ammunition has recently been prepared there. One order for the use of the army at Rome, received just before my arrival, was for two hundred batteries of field ammunition. Enlisted men, under the direction of a hired foreman, do all the work; an officer of artillery is in command. The careful directions of the Aide Mémoire do not produce as neat looking supplies as we are accustomed to see. Shells were all prepared with the wooden fuse. Port fires and slow-match were issued, and no friction tubes or percussion wafers. (The tubes may have been issued from Paris, where they are made.) Here they have received no orders to change the usual articles of issue. The ammunition is packed in very rough nailed boxes.

At Turin is the main arsenal for the Kingdom of Sardinia. The operations here, under the favor of the late King, who was interested much in artillery, had given a high reputation to that corps. Colonel Pictet, a Swiss officer in the Sardinian service, has been engaged here many years in experimenting upon rockets; and a Sardinian officer has proposed a heavy iron cannon, loading at the breech. I understood that he had obtained results from this gun sufficiently important to induce the English, French, Belgian, and Prussian governments to obtain such a gun for trial. These guns I saw at Woolwich, Paris, Liège, and Berlin, but in neither instance had the experiments proposed been prosecuted; owing, it is said, to the interruptions produced by recent political troubles at the time of their arrival. The gun has a bore of eight inches; is square at the breech, curving down to a cone in front of the charge. The load is inserted in the axis to the rear, and a wedge secures the breech pin. Colonel Pictet's experiments have all been conducted with the stick rocket, and he says, in a work published by him upon the subject, that he has obtained many accurate and important data in his long course of experiments, commending the use of rockets in war. Practically, but little has been obtained in Piedmont, as the fabrication has been suspended; and, at the recent battle of Novara, no rockets were carried in the field by the Piedmontese. An officer of their artillery, present in the action, told me that rockets were used against them by the Austrians without effect, but that their artillery men were picked off by the Austrian rifles, at 450 or 500 metres, very fatally, by men stationed on the church-steeples of Novara.
The arsenal is a large establishment, embracing a brass foundry, with the necessary lathes and extensive shops for the manufacture of carriages, implements, &c. Their small-arms and iron cannon, (for coast and garrison service,) some of which last have recently been introduced, are obtained by purchase. The field carriage stock is made of two pieces, separated by transoms and rondelles in front, but united under the lunette. They have but one size of field carriage, upon which 8 and 16-pound guns and 12 pounder howitzers are carried. The trunnions of the small guns are enveloped by bands to make them fit the cap-squares, and the elevating bed with its box and screw is movable. The field-gun axle is made of two pieces, overlapping each other at the centre about 8 inches. A large washer, with two pins passing through the lap and one strong bolt through the cap and axle body, secures the junction. The axle-bed is very large; about 7 inches by 9 inches, and the axle is set in the lower rear corner, so as to have more timber as a cushion in the recoil. The axle is 3 inches square at the shoulder, bevelled down to three fourths of an inch by 3 inches at the lap. A small sheet-iron box, holding slow match and some tools, is to replace the wooden boxes for the same object on the axletree-body; (all of those in wood were jolted to pieces during the recent short campaign.) The axles stood their service very well. Caissons and battery-wagons have axles in one piece. All carriages have shoes, and no lock chains. The sponge and rammer is carried as in the Grbeanval system—a hinged piece, with a heavy end, closing the mouth of the sponge-rest hook, thus:

The handle drops in, but it is necessary to raise the heavy end to get it out. Ammunition boxes are covered with cushions; no sheet metal on tops or sides, except at the corners. Baggage wagons for officers’ and men’s baggage are attached to each battery. These are made of slat-work sides, with uniform wheel and limber. The traces are of rope, like the French. The officer stated that in his battery not one was broken during the recent campaign. Siege-carriages are made like the field; but the limber has low wheels. Shot-wagons accompany the pieces. The omnibuses of the city were used as ambulances during the late action, and the officers stated that they were so well pleased with them that similar carriages would be established as the model.

An extensive military library, furnished by the King for the use of the officers, has attached to it pattern and model rooms, containing a large number of old and new arms; pattern carriages for field, siege, and garrison service; a model ponton and rocket train, &c. The pontons are of sheet-iron, made in sections, like the Pennsylvania canal boats. The King’s arsenal is said to contain the richest collection of old armor for man and horse now existing, with an extensive assortment of old and new arms from the earliest dates to the present time, all beautifully arranged in a wing of the palace. I should have mentioned that the axle-arm for carrying the spare wheel in the field caissons is hinged, so as to permit a motion in the vertical plane. This is said to save the wheel from being broken in rapid descents, as the rim is liable to hit the edge of the bank. A like arrangement is adopted for the trail handspike.
A sweep-bar is attached to rear of limber to relieve the pressure of the pole.

Switzerland has its main arsenal at Zurich. A new storehouse, of stone, contains about 100 field carriages and a ponton train complete, with a small supply of timber. But little work is in progress. Cannon and small-arms are purchased by contract. Carriages are made in the government shops, which are small, dark, and inconvenient. The carriages on hand are generally of the Gribeval pattern. One or two batteries of stock trail are in store, and those under way were of this kind. They have axle-bodies and small wooden boxes outside the cheeks. The handspike is hinged like that of Piedmont. Eight-pounder guns and 12-pounder howitzers go on the same carriage. There is an arsenal, containing a large collection of antique armor and weapons. Among the last, William Tell's bow; it is of steel. Zurich has an immense command of water power, and many fine manufactories have of late years been established here; among the rest, one for the fabrication of steam engines and machinery, and Swiss rifles. The company have in use a large number of very fine machines of the most improved kinds for planing, turning, boring, and punching heavy work. I was told that they receive orders for work from Naples, Russia, Italy, Germany, and Austria. They are now building iron boats for the Austrian government for use on Lake Como. As they receive the most of their iron and many of their machines from England, the cheapness and high character of the labor used is evident from the extent of their orders. The rifles are finished in a great measure by piece work. The contract price is only 36 francs, ($6.75.) A machine has just been finished here for driving congreve rockets for the government. The pressure is given by an hydraulic press. It has been tried, but was to be changed for further trial in some particulars.

Liège.—Belgium.—The armory already described (with the laboratory and foundry) the only military manufacturing establishment in Liège. The grand arsenal of Belgium is at Antwerp. It receives from the foundry here all castings necessary. Colonel Frederix, the polite and intelligent director of the foundry, among many other favors shown me, gave me a list of the cost prices of the different carriage castings, for several years back, made here for the arsenal at Antwerp.

The foundry, by aid of work constantly ordered by different governments, (with the sanction of the Belgian government,) is kept busily employed, (two steam engines being constantly in use,) and, by Colonel Frederix's energy, is in as advanced a condition as any establishment in Europe. Spanish officers, sent by their government, were studying the course of operations here at the time of my visit, and I was told that there are, generally, some foreign officers residing in Liège, attracted by the deserved repute of the work from its foundry. Recently, over one hundred
guns had been made here for Holland; a large order for the fortifications at Mayence was in progress; working patterns for Spain, and for one other government, have been nearly finished; and an application had just been received from Colonel Dundas to cast some trial guns for the English government.

As the guns made for Holland differ materially from any others made previously, it may be interesting to report some of the details concerning them, given me by Colonel Frederix. The pattern was proposed by Colonel de Bruyn, a Dutch artillery officer of high consideration at home, and its peculiarities are in the weight of the gun and the direction of the vent.

As the guns were needed to arm forts, Colonel de Bruyn conceived that they might be made much lighter than guns for use in siege operations; as the service charge is one-third for the first, and one-half for the siege guns. The gun proposed (a 24 pounder) had therefore less than two-thirds (about eight-thirteenths) of the usual weight, and the vent is inclined at an angle of 47° with the axis, as the best direction to escape injury from the blast. The exterior form is cylindrical for the length of the charge, and conical thence to the swell of the muzzle. Two proof guns first ordered were cast at Liège with great care, and of the best metal. The following are the principal dimensions, in United States inches, and metres:

<table>
<thead>
<tr>
<th>Description</th>
<th>Inches</th>
<th>Metres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibre of bore</td>
<td>5.97</td>
<td>0.1517</td>
</tr>
<tr>
<td>Diameter of base-ring</td>
<td>17.75</td>
<td>0.4508</td>
</tr>
<tr>
<td>Diameter of cylinder</td>
<td>17.25</td>
<td>0.4380</td>
</tr>
<tr>
<td>Diameter of com. of reinforce</td>
<td>16.93</td>
<td>0.4309</td>
</tr>
<tr>
<td>Diameter of end of reinforce</td>
<td>10.24</td>
<td>0.2600</td>
</tr>
<tr>
<td>Diameter of swell of muzzle</td>
<td>12.60</td>
<td>0.3200</td>
</tr>
<tr>
<td>Diameter of face of muzzle</td>
<td>6.30</td>
<td>0.1600</td>
</tr>
<tr>
<td>Total length of bore</td>
<td>101.60</td>
<td>2.5800</td>
</tr>
<tr>
<td>From rear of base ring</td>
<td>104.36</td>
<td>2.6500</td>
</tr>
<tr>
<td>Distance between rim bases</td>
<td>16.96</td>
<td>0.4306</td>
</tr>
<tr>
<td>Length of trunnions</td>
<td>5.21</td>
<td>0.1324</td>
</tr>
<tr>
<td>Diameter of trunnions</td>
<td>5.75</td>
<td>0.1461</td>
</tr>
</tbody>
</table>

Proposed weight, 3,891 lbs., (1,765 kilogrammes.) After finishing, No. 1 weighed 3,853 lbs., (1,752 kilogrammes); specific gravity, 7.227; and No. 2 weighed 3,922 lbs., (1,779 kilogrammes); specific gravity, 7.229.

No. 1 was first fired: charge, 3 kilogrammes of powder, in a bag 0.1417 metre in diameter and 0.26 metre in length, a wad of hay 0.45 kilogramme in weight and 0.10 metre in length, and a cylinder of iron terminated with a half sphere, weight 23.47 kilogrammes, smooth and of usual calibre. After 506 rounds, and on the sixteenth day, the muzzle broke off square, in advance of the muzzle ring, in two fragments, divided vertically lengthwise of the piece. This was supposed to have been caused by the wedging and breaking of the cylinder; but may have been due merely to the vibration caused by the discharge. The firing was continued, everything the same, to the 721st, when another fragment was detached from the piece, about one-fourth of it in size—weight, 202 kilogrammes—the upper and right portion of the chase. By a pile-hammer the chase was broken off evenly, and the remaining part fired with 1 kilogramme of powder and a cylinder, when it burst into three pieces. Objections having
been made that the use of the cylinder instead of balls did not furnish a
fair practical test, piece No. 2 was fired with the same charge of powder,
a wad, and two 24-pounder balls, with a wad between; the same kind of
bag for the powder, wads 0.1 metre long, and 0.45 kilogramme mean
weight; balls new and smooth, weight 11.8 kilogrammes. After firing
2,000 rounds, at forty intervals, the piece remained perfectly good. It was
then subjected to the water-proof, under a pressure of 560 kilogrammes to
each centimetre square of surface, without effect. The only change is the
enlargement of the vent, and a maximum increase of bore of 0.0007 me-
tre, (0.0275 inch.) The maximum increase of the bore of No. 1 was
0.0029 metre, (0.114 inch.)
This proof, considered by Colonel Frederix as the most extraordinary on
record—the relative weight of gun and charge being considered—and pro-
voking the high character of Liège castings, was deemed so satisfactory as re-
spects the pattern of the gun, that the Dutch government immediately ordered
104 pieces, and promised a new order for 100 more. As the cost of these guns
is at the rate of fifty francs the 100 kilogrammes, the difference of price in
purchasing 200 of these instead of the heavy 24's, weight 2,820 kilogrammes,
is 105,500 francs, ($19,254.) Colonel F., thinks it proven, that the cylinder
does not fairly replace the balls in proof firing; that the vent inclined to
the axis about 47°, is not injured so rapidly by the blast; that the bottom
of the bore in iron guns should be a hemisphere, and that the best metal
for endurance with large charges is not always the best for service charges.
I quote below a sentence from one of his reports, interesting to us:
"The artillery of the United States have recently made proofs à outrance of
12 and 6-pounder guns made in Sweden, England, Belgium and the United
States. The most of these pieces have only resisted 38 rounds, 20 with 1/6
the weight of powder and 1 ball, and 18 with 1/3 the weight and 2 balls.
One could only endure 13 rounds with this last charge after the first 20
rounds. It seems to me that the unsatisfactory results from this proof à
outrance is due either to defects in the construction of the pieces, (meaning
the form,) or to the quality of the United States powder—perhaps very bri-
sante—and that all the pieces with a charge of 1/6 or 1/3 weight of powder
of suitable quality and 1 ball would have endured and perhaps exceeded
2,000 rounds."
Speaking upon this subject, he expressed great sorrow that the "one"
worst piece above alluded to should have been his own, and thought it
ascribable in part, at least, to the fact, that with Belgian iron the outer
scale (which we turn off) was necessary to the endurance—more so, per-
haps, than with other iron. His experiments have induced the govern-
ment to forbid the turning of iron guns.
He has proposed two new mixtures for casting iron guns, which he
thinks will give a material more resisting, and at a less price, than those
used previously. The proportion of new or pig ore to old ore (pieces of
guns,) heretofore has been 50 to 20. He proposes:

<table>
<thead>
<tr>
<th>(1st mixture)</th>
<th>(2nd mixture)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6 new ore (made with charcoal,)</td>
<td>1/6 same.</td>
</tr>
<tr>
<td>1/4 new ore (made with coke,)</td>
<td>1/4 same.</td>
</tr>
<tr>
<td>1/3 old pieces (made with charcoal,)</td>
<td>1/3 same.</td>
</tr>
</tbody>
</table>

Mixtures of good ores of different localities giving better results than the
exclusive use of one. A trial 8-pounder, made after the first mixture pro-
posed,
(½ new ore— of 4 different ores, the trial guns from which endured respectively to 62d, 59th, 58th and 57th round.

½ new coke-ore— of two ores, the trial-gun from one of which endured to 56th round.

½ pieces of the 4 trial-guns first mentioned,) endured to 61st round, breaking into 38 pieces found, and 20 kilograms missing, showing the best indications of good metal in every respect.

A trial 8 pounder, made after the second mixture proposed of the same ores as above, burst at the 62d round into many fragments, showing, likewise, the best character of metal.

The proof series followed in Belgium is as follows:

<table>
<thead>
<tr>
<th>Powder</th>
<th>1 ball</th>
<th>2 wads</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 with 1¼ kilogrammes of powder</td>
<td>1 ball</td>
<td>2 wads</td>
<td>20  &quot; 1⅛ &quot; 2 &quot;</td>
</tr>
<tr>
<td>10 &quot; 1.958 &quot;</td>
<td>3 &quot; 2 &quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 &quot; 3.916 &quot;</td>
<td>6 &quot; 2 &quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 &quot; 7.832 &quot;</td>
<td>13 &quot; 2 &quot;</td>
<td>or till burst</td>
<td></td>
</tr>
</tbody>
</table>

A piece styled a negative musselotte, is moulded and cast with the gun. It is at Liège an elongated square, two and a half to three calibres long, of the sectional dimensions of the knob of the casable. The object is to heat the mould sufficiently to prevent the neck being chilled. The knob is turned to size from this. To prevent the entrance of the floating scoria into the trunnion holes, Col. F. proposed applying thin cast-iron plates of proper shape in the mould over these holes. The plates, perforated with small openings for the passage of the pure metal, as it rises, will be entirely melted when surrounded by the metal. This plan, though perfectly successful in some instances, failed, (through the carelessness of the workmen in placing a sheet iron instead of a cast-iron plate, or in using a rusty plate of too hard metal, Col. F. thinks,) in one or two instances; and from the report against its use by a board of officers, it has been forbidden. But Col. F. thinks it a great improvement, and he showed me very complimentary letters from the director of the Rueelle foundry, advocating its use, and stating that in casting several hundred guns by this method, not one had shown a defect in the trunnions—such defects being usual under the old system. The plan pursued at some of our foundries of covering the trunnion orifices with a sheet of metal, attached to a handle in the hands of the workmen, (to be raised gradually as the metal rises in the mould,) may possibly be less advantageous than this mode. As the best test of the quality of cast-iron for guns, a sample plate 1½ inch thick and 4 inches square is taken from each gun in turning, near the face of the muzzle, and broken under a drop hammer by blows upon a steel conical plug introduced into a circular bored hole in its centre. The hole has a diameter of .65 inch, and generally about 18 blows with the ram are necessary to break the plate. The plug-increases in diameter at the rate of ¾ in 1 inch. The wedge action under shocks is considered to represent more nearly the action of repeated charges upon the gun, than that by-pulling or snapping. The machinery in use seems to be very good and to work well. A new machine for turning trunnions (in which both are turned at the same time, and all the gearing and connecting parts lie under the work, so as not to interfere in lifting it on or off the machine) has been in use for a few years. The cost of turning per gun is said to be only 3.67 francs, (1.67 cost of power and 2 francs cost of labor,) and the adjustment securing the proper direction of the axis of the trunnions perfectly simple and easy. 1
have obtained a description of this machine—said to be superior to any in use in Europe. I was present one day at the proof trial of an 8-pounder test gun, cast of metal obtained for making 24-pounder howitzers, (Prussian pattern,) for the fort at Mayence. The piece burst at the 56th fire of the series.

A very tasteful and substantial cast-iron rack for small-arms has been adopted for the Belgian arsenals. It is made in the shops here. The cost per section containing 600 muskets is stated to be 471.20 francs, labor, materials, and proportionate expense of the establishment included. A description and drawing has been obtained.

Laboratory.—This is under charge of a lieutenant colonel, assisted by several officers. In addition to the operations described for filling caps, the chief work consists in preparing field and small arm ammunition. The buildings in use were erected for barracks, on a high hill above the town, and are now occupied (in the upper stories) by the laboratory officers and the enlisted company of workmen; and below, as shops.

Sabots for field guns are made of rolled paper; this being prepared of proper diameter, tightly rolled and dried, is then cut into lengths by saw, and turned (in hand lathes) as wood. They are made at one half the price of wood sabots, and are uninjured in transportation over the roughest roads. For 6-pounders the ammunition is fixed; the cartridge being tied in a groove in the sabot, short rims of the rolled paper, making a regular cylinder of ball and cartridge by placing one under the ball and one over the powder, are tied by cross straps of linen cloth 1½ inch wide, to the stand; the ends of the ligatures on the powder end serve as a handle in lifting the stand.

In making small-arm ammunition a cap is tied to each cartridge before bundling; no cap pouch being used by the Belgian troops.

Shells are not fixed to the cartridge. The fuse hole is placed so as to make an angle of 50° with the axis of the piece when in the gun, and the fuse known as Colonel Borman's fuse is used. Extensive experiments have been made recently with shrapnel shells; and the Belgians claim to have obtained some important information in the theory of the movement of projectiles not practically understood by others. The position given to the fuse hole of the shell, and the manner of placing the balls in the shrapnel, (now practised by them,) are said to be the results of these experiments. The details are kept secret, but one object is understood to be to have the centre of gravity of the projectile in the upper front quadrant, as our experiments have also proved to be advantageous. The fuse is very simple and cheap, and is spoken of in high terms by Belgian and Dutch officers, being adopted for shrapnels in those countries, and in Wurtemburg and Nassau, with a slight alteration. The results of practice in the Polygon of Brasschaat with 12-pounder shrapnels, reported by the board of officers, show, in 100 fires, only four failures; and of these, one prematurely exploded before reaching the target distance, 1,400 paces, and the three others, fired at 800, 1,200, and 1,400 paces, passed through the target, and exploded in the bank of earth behind. The composition of the fuse is three parts tin and one part lead. It has stood a charge of two kilogrammes of powder in the 12-pounder shrapnel, being over one-third the weight of the projectile, and has been tried with success in all calibres from 12-pounder to the 8-inch Paixhans. The cost at the laboratory of the fuse, complete, is said to be only three sous.
Friction tubes are not manufactured, and they are just commencing to replace the heavy iron percussion hammer, similar to the earliest tried by us, with what is called the Dundas lock in Belgium, being Hidden's plan of escaping the blast, reversed; that is, the spindle of the hammer fixed to the hammer, and sliding in slots cut in the side supports, exactly similar to one made in 1839 at Fort Monroe arsenal. Colonel Dundas told me at Woolwich that he had suggested the plan, (1846, I think,) upon seeing Hidden's lock, and combining it with the English lock then in use. The Belgians had not decided upon a cap for the lock, (using a tube at present something like the English,) but they had made a pressed copper thimble, similar to ours of paper, and were trying that.

At Mr. Fabisse's machine factory, (Liège,) he has in use an atmospheric drop-hammer, worked by belting from the steam-engine. He considers it more economical than the steam-hammer, and preferable to it also in having no drip about it from the condensed vapor. An iron cylinder reservoir is filled with condensed air by a pump worked by the engine. The hammer is raised by letting in this air below a piston, and depressed by its own weight, aided by pressure above and an exhaust pipe below. It worked perfectly. Another forging machine was used for forging cones from the steel rod. The hammer is at one end of a horizontal lever; under the other is a spiral spring. The steel nose of the hammer, which alone touches the work, is movable, resting on a shoulder downwards, and upwards (or above it) is a wedge-shaped piece, (receiving the force of the blow,) moved by a handle (in and out) held constantly by the forger. Above this wedge was a second short spring. The blow is therefore given under a double spring, assimilating it to the blow of a hand hammer. This pretty machine might be advantageously used in small forging. A small lad did a great deal of work with it, only assisted by another, who handed him the heated rods. The machines for turning and finishing the cones are very numerous; the cone requiring to be handled for each operation. After the screw is cut, the cone is held to the chuck by using its own thread, and the work is greatly quickened by having four pulleys with two belts. The cone screws itself into the chuck. The work is done. A reverse motion given, the cone unscrews itself, and the direct motion again applied, and a new cone secured without any stop, and without a jar or jerk.

Field-carriages.—Stock-trail carriages have been adopted; but those in use in the batteries at Liège are of older pattern. In Belgium, as in Holland and Prussia, caissons do not accompany the pieces, except in column of march; the number of rounds in the limber-box being esteemed sufficient for the early moments of the action. The advantage of this, in saving the wear and tear of caissons on drill, is very great; and as the present system makes each caisson follow its piece in all movements, (a part easily learned when required,) the argument is, that during peace their presence on the drill-ground is not necessary. The boxes of caissons cannot be exchanged; a second limber is sent forward to replace the empty one, which goes back to the line of caissons to be refilled. The percussion-lock is attached to the knob of cascable, a very large and heavy hammer. Traces, of rope. The middle horses pull from the bar, direct, by extra traces, passing through rear horses' trace-pipes, and sustained by straps from the collar. The straps supporting the lead-horses' traces start from the top of the rump, and extend well to the rear, so as to prevent the horse from getting his foot over the trace. Habitually the men do not ride on
the carriages, but the 6-pounder can carry three men on the limber and two on the axle-body boxes; the 12-pounder only three on the limber. Handspikes are fastened by a hinge-joint to the lunette plate, as described for the Sardinian service, except that the key, keeping it in place for use, passes above the handspike instead of through it. Horse collars fasten at bottom; prolonges are of chain. A shoe is used instead of lock-chain. Sponges and rammers are carried above the axle.

Berlin arsenal.—Field-carriages have not been changed since the report of 1840. Many systems of seasoning gun-carriage timber, tried since then, have been successively abandoned; among the rest, smoking had been tried, and much of the timber now on hand is marked with effects of this plan. At the arsenal a steam-engine is now in use, and its power has been applied to most of the machines. One-half of the workmen now employed are soldiers, receiving a small extra compensation; the rest citizens, who receive from 5 to 7 thalers ($3.50 to $4.87) a week. The tire-oven and machinery work very well; 100 tires can be set in one day by four men. This has been described.

The chief novelty here is a wrought-iron garrison carriage, which admits of being used either as a platform carriage, without chassis, or as a casemate or barbette carriage, with the chassis, and it can also transport its gun, by means of a field-limber, like our barbette carriage; it is composed of three chief parts: the chassis, top carriage proper, and a top carriage frame. The chassis consists of a tongue and two rails, with three transoms bolted together. It has a pintle-tongue in front to receive the pintle-bolt, securing it to the “small chassis” of wood. A pair of rollers sustain the centre, and move upon a travelling circle. In the end of the tongue, in place of a prop, is a large-headed bolt, screwing into the tongue, with its head upon the ground; by turning this, a greater or less inclination can be given to the chassis. The top carriage, very similar in shape to our cast-iron top carriages, has two sets of trunnion beds and a movable pointing bed, admitting thus of receiving the three different calibres and lengths of heavy guns in the Prussian service. Movable trunnion bed-plates can be attached in either bed, and the elevating machine advanced or withdrawn to suit the piece. Two axletrees, acting also as assembling bolts, with projecting arms to receive rollers, allow a rolling motion to be given front and rear, and make the carriage thus suitable for use on a platform. Taking off the rear rollers, (which are smaller and less thick through than the front,) and placing the top carriage on the chassis, the rear axle rests upon the tongue, and the ends of the cheek upon the rails. The front rollers also run upon the rails. It is now as used for casemate service. To make it a barbette carriage, the top carriage is lifted up and bolted upon the top carriage frame, (made similarly to the top carriage,) having a forward axletree with arms, which receive wheels and rollers similar to our barbette wheels, and a rear assembling bolt, which rests upon the chassis tongue, and cheeks resting upon the chassis rails. The projecting arms of the top carriage are not in the way of its free use as a barbette carriage. A movable fork-bar hooks into two of the rear assembling bolts, above one and below the other, having a pintle hole which fits upon the pintle-bolt of a field limber. The carriage can be dismounted from its chassis, as with our barbette carriage, and can thus transport its gun. The Captain told me that the carriage had been extensively tried and adopted. He spoke of its service very approvingly. It
appears to be very narrow for its height when mounted en barbette; but he said that an 8-inch howitzer had been fired from it 2100 rounds without injury, and that, when struck by a shot fired at it, (with a gun upon it,) it was repaired by replacing the piece struck, without dismounting the gun.

Stores of all kinds are prepared here for the depots throughout Prussia. Much of the work is done by piece-work, out of the arsenal. Some 200 workmen are thus employed, and 100 within the arsenal.

Spandau powder works.—One of the neatest and best-kept public establishments I have seen abroad. The grounds are nearly insulated, a bridge connecting them to the armory grounds. The buildings are numerous, of brick, and (where necessary) separated from each other by traverses of earth. Major Heim, of the artillery, is in command, and Lieutenant Kayser adjutant and assistant. In the absence of the Major, Lieutenant K. accompanied me through the works, explaining fully, as far as his orders permitted, all the operations. As this is one of the most recently finished powder factories, and one of the few public establishments abroad not encumbered by old fashioned structures, it may be interesting to mention some details of its construction. The officers’ quarters, extensive and neat buildings, stand near the bridge; the only approach to the shops thus passes the offices adjoining; and no soldiers (a rare circumstance) were seen within the command. All the coal used in making powder is distilled in a large furnace-house, containing twenty-five cylinders, with arrangements for collecting the residue of the distillation, and for conveying to a great height the noxious gases emitted. The fuel used is turf. Refineries for sulphur and for nitre, with store-rooms attached. A pulverizing-house for charcoal, one for sulphur, and two mixing houses for the combined ingredients, (placed in copper barrels, containing a number of brass balls,) are reserved for each of these operations. These houses have water-wheels in their basements; and only one large barrel in each room. There is also a house where the powder is moistened, after being spread upon tables; another for pressing it; another for granulating and sifting, (with a steam-engine built adjacent, but detached from it, and from which steam is conveyed to the drying-house;) another for glazing; another for hand-sifting and separating the grains, (in part of which is a weighing-room, where the powder is weighed, measured, and barrelled.) The copper barrels for rolling the powder are about five feet long by three feet diameter; the brass balls about six inches diameter. The time of rolling is considered an important item, and is kept a secret. The most of these buildings are neatly matted or carpeted, and every effort made to prevent dirt or carelessness. 110 pounds of powder are placed first in a linen bag, and then in a barrel like ours, with copper hoops, but without a proof plug. The magazines are not arched. There are five (I think) of them, about fifty by twenty feet. The materials are said to cost 15 thalers ($10.39) for the 110 pounds, and the government charges 30 thalers, ($21.78;) furnishing several of the smaller German States. Only two sizes of grain are made; both seem excellent, hard, clean, and of good taste and color. They have in Prussia, I understood, a cannon and musket eprouvette, but here the proof is by mortar eprouvette, (now of brass—to be in future of iron.) The charge of charcoal in the cylinders is distilled in from eight to ten hours. The acid product is sold to leather-makers and cotton-printers. Two explosions have taken place here since
the commencement of work, but neither from the powder. One, very
violent, was from the restrained gas of the distilling cylinders; the other
from the ignition of the sulphur in the pulverizing cylinders. The cause
of this last is as yet unexplained, and the same method has been con-
tinued without subsequent accident. East India nitre and Neapolitan
sulphur are used.

In the grand arsenal at Berlin there were none of the new muskets. A
very handsomely finished Russian field-battery, said to be part of the mar-
rriage cadeau of the present Queen, and some beautifully ornamented East
India pieces, presented by the Queen of England, are stored in the base-
ment rooms.

HOLLAND.

The arsenal, armory, laboratory, (including cap factory already described,) and a small iron foundry, are at Delft. All are under the command of a
general of artillery, with a director, (a major,) a sub-director, and several
subalterns assigned to each establishment.

The arsenal is quite extensive, employing two steam-engines—one for
trip-hammer, shears, and blowing cylinders; the other for iron-turning
lathes, circular and upright saws for timber, cap-making machines, &c.
In the trip-hammer shop is a small furnace, where the scrap iron is worked
up into axles and heavy shapes. A captain receives and issues all supplies;
a lieutenant is in charge of each shop, and a mechanician (at $700 a year)
superintends the machinery in all the military establishments at Delft. The
trip-hammer forger receives 10 francs a day; other workmen from 2 to 3
francs. The axles of all field-carriages have the same arm, but there are
three different weights—one for 12-pounders, one for 6-pounders and cais-
sons, and one for store and baggage wagons. The first is made square,
the second and third bevelled between the arms, having the horizontal
thickness less than the first, with the same vertical dimension; the same
axle, body, and straps answer for all. Pieces of timber dressed to fit the
vacant space are carried in the wagons, so that any one axle can be im-
mediately replaced by any other. The same principle is carried out with
the wheels—all having the same box, but differing in diameter of nave
and in thickness of spoke and felloe. The same system is pursued with
siege-carriages—the three weights of axles and wheels assigned respect-
ively to the gun-carriages, transporting carriages, and store wagons.

For field service the weights are as follows: 12-pounder axle 56 kilo-
grammes, wheel 94 kilogrammes; 6-pounder and caisson axle 42 kilo-
grammes, wheel 77 kilogrammes; store wagon axle 30 kilogrammes,
wheel 68 kilogrammes. To be turned, the axle is bent, the arms turned
by a hand tool, and, when finished, heated and straightened. To keep
the wheel-box in place, the exterior of the small end is screw-threaded;
a brass circular rim-plate screws on this, and is fastened to the nave by
two small wood-screws. The washer has a shoulder, catching against
the linchpin, which prevents its turning with the wheel. The mode of
attaching the rear carriage to the limber is peculiar. It is the invention of
Colonel de Bruyn, who kindly furnished me with a drawing of the plan,
to which I beg to refer for an explanation. It is said to be difficult to
make, and costly, but to steady the pole very well. Instead of carrying
extra wheels on the caisson, as with us, they are carried upon a spare
gun-carriage. A block of wood is fitted in the trunnion-holes, having in
its centre an upright axle-arm of double length, on which two wheels are placed. Spare poles are made with a hinge in the centre, well secured with iron, to fold up in transportation in the battery wagons. The forge has a cylindrical bellows, occupying but a small space. The grate is very large, and they say they can weld an axletree in the forge. Two battery wagons for stores and two for baggage accompany each battery. That for the men is supplied with a large kettle for soup; a grate beneath and a movable smoke-pipe fit it, to be used in place in rainy weather. The limber-box is fitted up as a company desk, with writing table, and pigeon-holes for books, papers, &c. A rail round the tops of the main wagons gives room for knapsacks, forage, &c. Traces are of rope, doubled for pole horses. Pole with a simple staple and straps. Prolonge of chain; used also to attach the shoe in locking. The shoe is hung, detached from the chain, on the rear axle-body. In shoeing horses, they use throughout the country a foot-stool to rest the hoof upon. One of these is carried with the forge. Handspikes are hinged, as in Belgium. Ammunition boxes not transferable. Sponges of bristle, carried on top the axle. The limber-box is divided into three compartments, with separate covers; 54 rounds of 6-pounder ammunition in the three. A kind of basket of hoop-iron is attached to the gun axle-body, in which is carried a stand of grape or canister, to be used at any moment of emergency.

Siege carriages are not stock trail, but with flasks. The cheeks are of cast-iron, bolted on to the top of the upper part of the flask. This can be changed for different calibres. The cast-iron piece contains trunnion holes and travelling trunnion bolts. No cap-square is used. Front wheels are smaller than the rear. Mortar beds and wagons are nearly as with us. An ordinary handspike windlass is attached to this last.

In the model room of the arsenal, a complete specimen of every carriage, full size, with its gun, implements, stores, &c., is kept in very nice order. The barbette carriage similar to ours in general features. A movable wooden support, to be placed under the middle transom of the chassis in firing, is issued with every carriage. The officer stated that before this was done the chassis were constantly failing. It has proved of great advantage. The traverse circles are made of timber, with an iron plate for the wheel to run upon. They are made of three pieces, hinged to suit different calibres. These are likewise issued with the carriages, being thought preferable to stone circles. Attached to the traverse wheel of heavy carriages is a rack and pinion, with a crank handle. The heaviest calibres are easily adjusted to the exact direction by this means. Under the transom and axle-tie of the barbette carriage a strong iron plate (bent over the transom and the tie) runs the whole length. The lunette is welded to it.

Several modes of preserving gun-carriage timber have been tried and abandoned. I saw some fine logs recently arrived from the Dutch East Indies, imported as an experiment; they were of white oak, with a fine, close grain. The timber heretofore used, a very good white oak, equal to any we have, is obtained from Belgium and Germany, and costs, when sawed and stored, 65 cents a cubic foot.

A ball-press, similar to that at the Washington arsenal, is in use. In making the packing-boxes for the balls, the end-pieces are grooved for alternate layers, the lower layer fitting snug by means of the width gained by the groove on the left end-piece, for example; and the next layer the same, by the groove in the right end-piece; the third groove to the left again, and so on. By this means the balls of each layer rest in the inter-
slices of the lower layer, and can be transported securely without rolling in
the box.

The foundry at Delft was not in operation at the time of my visit. It is
small, and principally engaged in casting shot and shells, and parts of
machines, by the usual methods. It is proposed to enlarge it, and cast
cannon for arming the forts.

The brass foundry, casting all the brass guns needed, is at the Hague;
a very ancient establishment, but turning out very good-looking work. Six
6-pounders and two 12-pounder howitzers form a battery; the last not
chambered. These guns are shorter than ours, of about the same weight.
The vent is bored at an angle of 47° with the axis, coming out through
the breech. A hausse is attached to the base-ring, and the same hausse for
long ranges can be applied at the centre of the length. Hammer supports
are cast on the knob of the cascable. The gun is cylindrical for the length
of the charge.

Mortar éprouvettes of bronze, heretofore in use, are to be replaced by
iron. The gauges for measuring the bore and the ball are very neat and
accurate. Light-house lanterns are made in the foundry shops here.

Laboratory—Delft.—A very neat yard and appropriate building. The
chief work in hand was in preparing Colonel Borman’s fuses, adopted for
shrapnels. A percussion fuse is under secret trial, with very good results,
the officers said. The workmen are enlisted men.

The cartridge is tied to the shot—sabot, as with us. But
for the shells, a brass wire hook is attached to the bottom
of the sabot in a groove, (so that the hook does not touch
when the sabot is placed upon its bottom,) and the car-
tridge is hooked on at the movement of the loading.

Here, as in Belgium, they were trying to introduce a proper cap for the
cannon lock. One of ours which I gave the director pleased him very
much. No friction tubes are made. Shells in use have the common
wooden fuse.

Powder, in Holland, is furnished by a contractor; and it is said to be
excellent. But two sizes of grain are used—that for cannon being larger
than ours; the musket grain is a little finer. There is an idea with the
officers here (and since, I have heard of it in France) that the powder for
cannon should be of a large grain and as dense as possible. Colonel du
Bruyn stated that they had now advanced a little in this respect, but that
he thought a greater change from the present mode would soon be adopt-
ed. His cannon powder has 80 grains less in the gramme than ours, and
is very hard and dense. As stated before, he has proposed a light 24-
pounder garrison gun, calculated for charges of ½ only, (its ordinary charge
to be ¾.) This last (¾) he is anxious to introduce as the maximum for all
guns. He expressed the greatest astonishment to hear that our field-
charges were only ¾, and desired me at once to return with him to the
Minister of War, and tell him of it, as (he said) he had a strong party
against him in the proposed reduction to ¼.

The Colonel invited me to see the company of horse artillery manœuvre,
in which they all seem to take much pride. The horses, harness, &c.,
were in fine condition, and the movements of the battery very rapid.
Caissons do not appear on drill with the pieces. The chief peculiarities
noticed have been previously described.

The barracks at the Hague are noble buildings, sufficient for 10,000
men. The army of Holland amounts now to 60,000.
Woolwich arsenal, the great military establishment of the kingdom, embraces three distinct commands within its extensive walls—the foundry, the carriage department, and the gunners' stores department. The first is responsible for the supply, to army and navy, of guns, shot, shells, percussion locks, and carriage castings; the second for ship and land carriages, with the necessary implements; and the third for gunners' and laboratory stores of all kinds. The director of each has to be guided exactly by established patterns, sanctioned by the Board of Ordnance, and all changes proposed are generally examined by a board of officers, where the three departments are represented, and can only be adopted after the final sanction of the Board of Ordnance.

The foundry department has recently been extended and improved: a steam engine of 40 horse-power, with many new machines conveniently positioned, having a suspended railway above them for moving the work from one to the other, has just replaced the old turning lathes and horse-power in use in 1840. All are now of the most improved English patterns, and the capabilities of the establishment equal to finishing completely six guns a week, without increasing their ordinary time of work. The steam-engine generally works half-work, (20 horse power;) it has two boilers with steam surface enough in each to work doubly as powerful an engine; this being now considered in England essential to effect a proper security and due economy in fuel. The grates (two to each boiler) after the fires are first lighted in the morning, are fed alternately, and but three times a day, the last time at 11 a. m.—the large mass of heated surface keeping the water boiling from that time till evening. The consumption of fuel is only 20 pounds of coke to the horse power per day. There are three travelling cranes in the finishing shop, running upon iron rafter beams. The same cutter commences the bore in all calibres, a second then finishes it to the proper size. They adhere to the old method of clay moulding; and Colonel Dundas thinks that there are dangers in the sand moulding, which will yet cause it to be abandoned. In casting 6 pounder guns, 13 moulds are placed in the same pit, this being as great a weight of metal as his furnaces can heat. Three sets of calibres have been adopted for field-service, each composed of a gun and howitzer, viz: 6 pounder gun and 12-pounder howitzer.

On three sizes of carriages

\[
\begin{align*}
9 & \quad 24 \\
12 & \quad 32
\end{align*}
\]

This last howitzer is much liked in practice, but, as yet, they have not used it in active service—none having been sent to the eastern army. The workmen are generally under age, and many of them apprenticed to himself. He has but two or three men employed in all the foundry operations, finding, he says, that these boys, properly instructed, are better than the best machine builders from private shops. They receive from 36 to 50 cents per day, and the men from 80 to 100—one, $1 50. The cost of finished field-guns is £135 per ton ($29 17 per pound.)

Iron guns, shot and shells are furnished (through his department) by contractors, and issued by him to the directors of the carriage and laboratory departments.

Percussion locks are fitted to all guns, to be used with a tube of quill, one of which is submitted herewith. The lock has an iron hammer for iron guns and a brass hammer for bronze guns. The nose of the ham-
mer is curved to fit half round the vent, and, by means of a slot in the supports, is drawn back to escape entirely the blast. It is attached by two pins and one screw to the gun. No friction tubes are used. Lock covers of cast brass are issued with the lock.

The carriage department has also been recently extended. A steam engine to work a trip-hammer and furnish blast to two furnaces, made to work up the scrap iron, had just been started; three small engines (two locomotive) turned a horizontal planing machine, (the chisels attached to an iron wheel seven or eight feet in diameter;) also a vertical face-plate with a horizontal axis, (to which is attached the joined felloes of the wheels to be planed;) a mortising machine and a tenoning machine. One of the locomotive engines blows the forge bellows—another pumps and turns lathes.

The timber used for carriages is excellent: that for ship carriages being of mahogany, teak, Cuba wood (like mahogany) or African wood. The stocks of field carriages are always made of two pieces of English oak. They still make the tires in sections and place wooden boxes on the gun axle-bodies. The iron work to be painted is not filed or smooth-finished. The carriages appear to be very strong and substantial, much heavier than ours. Field-gun carriage axles are made in two pieces. A roller is attached to the rear of the barbette top carriage, for the 8-inch solid shot-gun, which is made to receive the weight by a lever arm, when the carriage is to be run into battery; one man easily works it, and it saves much labor as well as wear upon the chassis. Cast-iron carriages are not expected to endure much firing; wooden ones are always kept ready to replace them at the forts in case of war.

Laboratory operations are conducted with much secrecy; some of them I was permitted to see, but I was not shown the shell-filling rooms or the rocket factory. A steam engine drives such machines as they use in making caps, pressed balls, turning, &c. The eyes of sea-service shells are screw tapped, and the fuse is of brass; for land-service it is of wood and the eye smooth. Although our new fuses have given excellent results, with as simple a mode of use as any perhaps, it may be interesting to state some few particulars of the English practice, received from an authentic source, as they have well satisfied themselves that they obtain from the shell, according to this practice, the best results of which it is capable. The shells are made of the best and most resisting metal; the smallest calibre for the 9-pounder, the largest for the 8-inch howitzer.

<table>
<thead>
<tr>
<th>Calibre of gun</th>
<th>Charge of shell</th>
<th>Charge of empty</th>
<th>Weight loaded</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-inch do</td>
<td>$\frac{13}{16}$</td>
<td>$\frac{1}{4}$</td>
<td>63</td>
</tr>
<tr>
<td>8-inch howitzer</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>2-pounder gun</td>
<td>3</td>
<td>10</td>
<td>13 3</td>
</tr>
<tr>
<td>12-inch do</td>
<td>4</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>18-inch do</td>
<td>4</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>24-inch do</td>
<td>6</td>
<td>6</td>
<td>130</td>
</tr>
</tbody>
</table>

Fuses are made of beech—one pattern for the 9-pounders and one for all other calibres. The wood to be perfectly seasoned and free from all defects,
and to be split to size. The fuse being very short, must be turned with care, and a half-inch of solid wood left at the bottom of the bore, in boring. After boring smoothly the inside, a tool marks on the outside the bottom part of the bore, and another (inserted in the bore) slightly and evenly marks the inside every one-tenth of an inch. The cup is formed by the usual cupping tool, and (by another tool) is made larger at bottom than at top. They are examined carefully, and rejected for the slightest defect. The composition used is, nitre, eleven and two-third parts; sulphur, three and two-thirds; mealed powder, nine and two-third parts—passed separately through a silk sieve, (very fine,) weighed, and mixed. In driving, each charge is evenly put in and struck thirteen blows with a one-pound mallet. When charged within 0.2 inch of the top of the bore, the fuse goes again to the lathe, and is marked in divisions of two-tenths of an inch on the outside between the bottom line already marked, and the upper surface of the composition. It is then primed with two strands of quick-match, secured in holes bored in the cup, and the cup filled with mealed powder moistened with spirits of wine; this is pressed in evenly with a spatula and the top sprinkled with dry mealed powder; when perfectly dry, the ends of the match are fastened together, a disc of oiled paper placed over the cup, the fuse capped with a piece of fine linen, covered with two coats of paint, and tied with a thread. The fuses are kept in the magazine in this condition. Before issuing them, they saw them into lengths suiting the thickness of the different shells at the fuse hole, bored out the excess of powder from the lower end, according to the prescribed table of lengths, and mark the fuses A, B, and C, for the ranges of 650, 900, and 1,100 yards, and pack them in tin boxes, painted white for A, red for B, and black for C. Four fuses are issued with each shell—three designated by the above letters and cut to prescribed lengths, the fourth left the whole length. These last are packed in canvass bags, (the proper number for the shells of each piece,) with two fuse extractors and two fuse augers in one bag, which is carried in the limber-box of the piece. The three tin boxes containing the cut fuses are likewise in this limber-box. In firing, canister-shot are expected to be used up to 650 yards, and balls or ordinary shells beyond 1,100, as it is only between these ranges that shrapnels are of the most value. The angle of fire and length of composition for each calibre is as follows:

<table>
<thead>
<tr>
<th>Letters of fuses and range.</th>
<th>12-pdr. howitzer.</th>
<th>24-pdr. howitzer.</th>
<th>8-inch howitzer.</th>
<th>9-pdr. gun.</th>
<th>12-pdr. gun.</th>
<th>18-pdr. gun.</th>
<th>24-pdr. gun.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 650 yards...</td>
<td>2 15 0.3</td>
<td>2 15 0.35</td>
<td>2 45 0.35</td>
<td>15 0.29</td>
<td>1 15 0.2</td>
<td>1 15 0.2</td>
<td>1 15 0.2</td>
</tr>
<tr>
<td>B 900 yards...</td>
<td>3 30 0.55</td>
<td>4 50 0.6</td>
<td>3 30 0.6</td>
<td>1 45 0.4</td>
<td>4 45 0.4</td>
<td>2 00 0.4</td>
<td>1 45 0.35</td>
</tr>
<tr>
<td>C 1,100 yards...</td>
<td>5 15 0.8</td>
<td>3 75 0.75</td>
<td>6 30 1.0</td>
<td>2 30 0.6</td>
<td>2 30 0.57</td>
<td>3 00 0.57</td>
<td>2 30 0.50</td>
</tr>
</tbody>
</table>
The rate of burning is five seconds to the inch for all fuses. The diameter of fuse hole at top is .65 inch for 9-pounders, and .9 inch for other calibres. (6-pounder shotpens are still issued at times, but in a smaller proportion to the solid shot than in other calibres. The 9-pounder fuse is used, and the charge of one-third in the gun.) Most of the above information is derived from a publication by Messrs. Terqueme and Favé, officers of the French artillery, and my apology for introducing it is, that it is more precise and definite than any previously published upon a subject of very general interest to officers of artillery.

In the arsenal yard at Woolwich, I saw the new 8-inch iron gun recently adopted as a solid-shot gun in the English service. It weighs 113 cwt; and, besides using a solid iron shot, it has been proposed to use a shell filled with lead in order to obtain great ranges at a low elevation. The shell is made as thin as possible, with projections within to prevent the lead from getting loose. Colonel Dundas spoke very favorably of the gun, stating that the experiments which determined its adoption had been very interesting and satisfactory in the length of range and accuracy of fire.

Many fine large sheds have been recently erected within the arsenal, after the style introduced in many railroad depots in this country and abroad, supported on cast-iron pillars with rod-iron roof frames, and covered with framed glass or corrugated sheet metal, the partitions being also of these sheets. The shops for working up scrap iron, for painting and storing carriages, for planing machines, &c., are so covered. While cheap and fire-proof, these buildings are extremely tight, convenient, and tasteful, and their more general use at our arsenals would, I think, be found advantageous in the increased comfort and security, (especially at the southern arsenals, where there are no heavy falls of snow.)

In lubricating machinery, in the English and in some of the Belgian establishments, I notice they use soap-suds instead of oil.

There are in Paris or its neighborhood many institutions forming a part of the military establishment of the country, a few remarks about which may be permitted, though all of them are not among the novelties in military matters to which my attention was particularly directed. As similar institutions have been, in whole or in part, established in the different capitals of Europe, and full descriptions of many of them may have been published, I will merely mention a few peculiarities obtained when visiting them. The Polytechnic and military schools for officers are supplied with students by selections made from all the schools of France by a standing committee of examiners, who visit in turn all parts of the country. The most promising of those desiring to enter the staff corps of the army, between the ages of 16 and 21, go to the Polytechnic, others to St. Cyr or Saumur. At the first they remain two years, and, after examination, are assigned according to the wants of the service, in a prescribed order, to the different corps, according to their class standing, to be varied at the request of the student when not interfering with those above him. Those assigned to the engineers and artillery are sent to the special school of those corps at Metz, where they remain two years, and then go to their companies until promoted. Those assigned to the civil engineers (for the construction of roads and bridges and public buildings,) and those for the engineers of the marine (coast survey and foreign duty,) go to the offices of these
corps in Paris. Those for the general staff, to the school in Paris, where they remain two years; thence to the infantry school of St. Cyr, and thence to the cavalry school of Saumur, for short periods; and then they are sent to companies in the field to serve until promoted. Two of the graduating class of the Polytechnic, each year, are selected for the tobacco régie, and are sent, after graduation, to the government factories to acquire the proper experience for administering those establishments.

The schools of St. Cyr and Saumur furnish from their graduates two-thirds of the officers of the infantry and cavalry corps, the other one-third being selected from the most distinguished non-commissioned officers in the different regimental schools. These students are under the same military law as conscripts; and while I was in Paris, forty of those at St. Cyr, convicted of combining against the authorities, were, by order of the Minister of War, transferred as privates to the regiments, their only chance of promotion left being through the regimental schools after becoming non-commissioned officers. Foreign officers, by special favor, are permitted to enter any of these schools for their instruction. At Metz I saw several Egyptian and South American officers, who were going through the course of studies, and were assigned to companies as sub-officers at drill. They were clothed in the uniforms of their own services.

The Musée d'Artillerie at Paris, with the Atelier de Précision and a large chemical laboratory, is attached to the offices of the Permanent Committee of Artillery. A large and valuable collection of old and existing models of artillery, equipages, and small-arms, fancy and foreign arms, cannon, and equipages, are in the museum. Inventions and novelties appearing in different countries are procured and deposited here for trial by the committee. Heavy iron cannon made at Ruelle, after the Sardinian pattern, loading at the breech, and an infernal machine, just arrived from Denmark, were among the new untried inventions. This last has wall-pieces and musket barrels fastened together in nests, much like the "infrantryde" deposited at the Washington model office. The barrels, loaded with twenty charges each, to be fired successively by a match lighted at the muzzle, are attached to an elevating arc; a limber with ammunition box is attached. A cast-iron barbette carriage with its chassis, strongly ribbed, has been tried much, and thus far favorably, but it has not yet been adopted.

The shops where pattern arms and inspecting instruments, standard gauges, &c., are made and stamped—to be sent to the armories and arsenals—are small and inconvenient. The work is done chiefly by hand; a few hand-turned machines are used. They were preparing éprouvette balls, and adjusting mortars. In turning the first, a hand-lathe is used to turn the ball—the cutting-tool moving by a screw on a semi-circular horizontal rest. The work done is very neat and accurate.

The laboratory, under the charge of Captain Piot, has every convenience for experimenting—furnaces, chemical laboratory, instruments, and materials. A mineralogical cabinet has also been attached to it. Here, experiments are made testing the chemical qualities of materials used in the artillery service, the purity of specimens of metal offered for use in casting, &c., bringing thus chemical science in aid of the practical intelligence of the artillery. Another valuable collection of antiquities of all kinds—a among the rest, of artillery implements—exists at the musée of the Hôtel.
There is to be seen here an 8-barrel revolver (with flint-locks) of considerable antiquity—very like the improved revolvers in use with us.

The Hotel des Invalides—a hospital for old and wounded soldiers—is an institution of great value in the French service, reconciling all classes of society to the hardships of army life, as all know that they will be here comfortably lodged and honorably cared for when aged or maimed, no matter what rank they may have attained. Military rules and discipline are just enough maintained to secure an economical and orderly management of the institution, and give the old soldier employment enough to make him think himself still useful. The appearance of the invalides, in their respectable-looking uniforms of the last century, is extremely interesting; and a stranger would say that, of all the public institutions in France, this is, perhaps, the last that would be abolished by a vote of the people, so universal is their pride in pointing out the building and in speaking of its inmates. A maimed soldier is never seen begging in France.

The polygon and arsenal at Vincennes.—Attached to the castle of Vincennes is a large arsenal for repairs of small-arms and artillery carriages, and the preparation of infantry and artillery ammunition. The recent disturbances in Paris have demanded such large supplies of ammunition, and the repair of so many arms, that every building about the castle not in use as quarters (including the chapel and a large small-arm storehouse) is devoted to this last; and within an advanced work of the fort, new laboratory buildings and storehouses (with barracks and stables for the regiment of artillery quartered there) are crowded by the workmen engaged in making cartridges. Twelve field-batteries complete, besides those now in use, are kept ready for any emergency. Hired workmen are employed about the arms; the ammunition is prepared by the men of the regiment, superintended by non-commissioned officers. The peculiarities of the small-arm cartridge can be best understood by observing the specimens accompanying. 8-inch howitzer canisters are made of sheet-iron, instead of tin.

The stables are very neat and clean, and great care is given to the horses. A stable guard of hostlers is always present. The division between the stalls is, in all French stables, a plank hung on a hinge at the trough, and suspended from the rafter at the other end by a chain fastened with a swivel, so as to be easily dropped if the horse gets his foot over it. The horses stand upon straw, and were all blanketed (in February.)

The polygon for artillery practice—(the infantry school has been recently removed to St. Omer)—offers every facility for safe practice at the longest ranges. Generally, experiments are carried on here every year, during good weather; but, in the last two years, they have been much interrupted by the political disturbances in Paris. I was unfortunate enough to miss them.

Temporary barracks have been erected in many of the public squares of the city—to lodge the greatly increased garrison—since the revolution. These buildings are very neat, comfortable, and cheaply made—superior, I think, to our temporary structures, and probably less expensive. The frame of the building is made, as usual, with inclined braces between the uprights; the interval is then filled in with plaster made of clay, or common mortar, of the thickness of the uprights. They have tile roofs, are of one story, and heated by a stove. When whitewashed, they present a very respectable appearance, and are but little exposed to the danger of fire.

The veterinary school at Charenton is very liberally supported by the
government for the education of surgeons for the different corps which use horses. Handsome and convenient buildings, including quarters for directors and students, with all the necessary rooms for clinical and theoretic instruction, hospital stables for diseased horses, and pastures for those under treatment, exist here: a second establishment of the same kind is at Lyons. The efforts made of late years by the government to improve the breed and treatment of horses have already secured important benefits to the country—especially in obtaining a better re-mount for the artillery and cavalry at less cost than formerly.

A similar establishment at Berlin was visited, conducted on a very large scale, where the government permitted the sick horses of individuals to be lodged, upon the payment of 4½ francs a week for forage and attendance. Connected with this last was an enclosure, with strong pens attached, for the confinement of mad dogs. The students were required to note daily the phases of the disease, and experiments were made to abate its violence and to find out an antidote to the poison generated. An extensive anatomical apartment, connected with the institution, contained skeletons of all breeds, ages, and conditions (as to health) of horses, cows, dogs, and domestic fowls; among the rest is shown the skeleton of the great Frederick's famous white charger, and beside him that of an Arabian presented by Mahemet Ali.

Manufactury of military equipments, Paris.—This is a private establishment, but the work is all done under the constant control and inspection of officers. A board composed of an officer of each army corps visits the shops weekly, or oftener, if they see fit, and inspects the leather in all stages of its manufacture, and other materials before and after completion. They were, making uniform caps and ornaments, epaulettes and wings, belts and plates, buttons, cartridge-boxes and cap-pouches, leather gaiters, and leathers for the cavalry and artillery pantaloons. The clothing guide, which I have obtained, gives details upon all these and other articles of equipment. The attention devoted to the inspection of the cloth, and afterwards to the fit and make of the clothing, secures to the army neat and excellent uniforms, at far less rates than with us. A board composed of the colonel, lieutenant colonel, major, and a captain in each regiment, is required to inspect each article of outside dress upon the man. I have seen more than once all these officers, with the company tailor, examining the fit of the recruits' jackets and coats upon their arrival at the regimental headquarters.

UNIFORMS AND EQUIPMENT OF CORPS.

Several nations have adopted for foot troops a frock coat with skirts covering the hips, as the full uniform coat. This was introduced in France by advice of the medical officers, whose report subsequently proved that men so clothed suffered less from ordinary complaints than those in jackets or body coats. The infantry of the line and chasseurs in France and Belgium, and all corps but the artillery in Sardinia, Tuscany, Prussia, and the German States, are now so clothed. Epaulettes or wings are worn on the coat by the men, and epaulettes by officers. These last retain the full dress coat, but it is not used on drills or parades. The men's overcoat is double-breasted, and is usually worn on guard, drills, and marches; the epaulettes or wings being transferred to it. French officers have also a uniform overcoat, made loose and convenient, with distinctive marks de-
noting the rank on the sleeve. The knapsack, covered with skin with the hair on, is much more durable than ours. On campaign, every soldier carries a bed-sack, which he can fill with hay, or prop up on stakes, for the night's sleep; it is folded up under the straps of the knapsack during the day. A valise, with circular ends, carried on top of the knapsack, receives the coat; the full dress cap is placed over one end of this, the knapsack strap keeping it in place: thus, marching in overcoat and forage cap, he has his whole equipment with him, and can, in a few moments, assume his full parade dress. Full directions for the cutting and making the different articles, with the rules prescribed for their inspection and issue, have been published; a copy of the work has been obtained.

**Infantry.**—Officers wear a light sabre, of the pattern sent by me to the Ordnance Office. They speak of it as being very good and serviceable. The price in Paris is $9. The men have no cross-belts; wearing the cartridge and cap-boxes, bayonet-scabbard, (and in the flank companies the short sword,) upon the waist belt; belt black.

The artillery have a sword bayonet, worn on a white waist belt. The cartridge-box on a cross-belt, wide and short, not reaching to the waist-belt. The ends of the box are of sheet-copper, with brass buttons, and loops to which the belt is hooked by swivels. Non-commissioned officers have a pistol and sabre instead of the carbine; the same cartridge-box. Officers also wear a similar box.

**Cavalry.** same box; sabre or lance. Dragoons have a musketoon; heavy cavalry and lancers, one pistol.

**Chasseurs.**—Carbine, with sword, bayonet, and cap and cartridge-boxes on black waist-belt. These troops are drilled much at gymnastic and athletic games. A copy of this drill has been procured. Strong short men are selected.

**Sardinia.**—All the infantry have the short-sword as well as the bayonet; no bayonet-scabbard. Boxes and sword-scabbard carried on waist-belt.

**Belgium.**—No cap-pouch is carried; each cartridge has a cap tied to it. No cross-belt for infantry. Artillery have only the short-sword; no carbine. Non-commissioned officers mounted; sabre and pistol.

**Prussia.**—The men having the new musket carry two cartridge-boxes, worn in front, on the waist-belt. None carry the bayonet-scabbard or cap-pouch. All have the short-sword, carried on waist-belt. Troops with the old arm have but one box, with a pouch for caps sewed on the right end of the box. Artillery only a short-sword.

**Hanover and Saxony.**—All the infantry have the short-sword, and no bayonet-scabbard. In the regiments of the line, the cartridge-box has long loops attached, through which the waist-belt passes; cap-pouch sewed to right end of box. In the guards, the box and sword are carried on cross-belts of white leather, and the cap-pouch, of the same leather, sewed to cartridge-box belt, on the breast; no waist-belt.

**Holland.**—The infantry have the short-sword and cartridge-box, carried on white cross-belts, and a bayonet-scabbard sewed to right side of cartridge-box and its belt; no cap-pouch; each cap tied to its cartridge; no waist-belt. Chasseurs have a rifle, and a powder-flask and pouch, on black cross-belts; a cap-pouch, and mallet to force the ball, are carried on a black waist-belt. Cavalry have a musketoon, with a loop trigger, so made to prevent objects catching in it. Horse artillery carry sabre-tash, and a pistol: a few musketoons attached to limber ammunition box.
England.—Infantry have white cross-belts, carrying cartridge-box and bayonet-scabbard; no waist-belt; cap-pocket in the right side of the jacket, lined with water-proof cloth, and covered with a leather flap.

The above peculiarities, noticed in passing through the different countries, may not, in every case, be the last prescribed patterns; they were used, however, by some regiments, as stated, and, as far as observation and (generally) inquiry proved, are such as are now used in the corps named.

**DR. BOUCHERIE'S PROCESS OF IMPREGNATING TIMBER.**

At the national exhibition in Paris, I had the pleasure of conversing with Dr. Boucherie, and of seeing specimens of woods impregnated with a solution of sulphate of copper, by his method. He confines the application of it to soft woods, generally, and exhibited, among other articles, a work-box and secretary made of a tree within three months after it was cut, which prove the wood to be well seasoned. The color given by the sulphate of copper is quite pretty and peculiar, being in redish and brown streaks and shades, unlike the effect of painting. After varnishing, the appearance is rich, and he says will be permanent. He shows a block sawed into three sections, but not disconnected, which has been buried for six years in a fungus-pit. It is of pine; and immediately after being filled, the two side sections were impregnated, (by means of the natural action of the sap vessels of the wood,) the one with the dento-chloride of mercury, (corrosive sublimate, as recommended by Kyán,) 800 grammes of 1.5 per cent. strength; the other with 800 grammes of sulphate of copper, of 1.5 per cent. The centre section was left in its natural state. The block now shows the portions which were left in the natural state, and that impregnated with the corrosive sublimate equally and completely rotten, the fibre destroyed, and the wood crumbling into dust, while the section marked as impregnated with the sulphate is perfectly sound and good.

The Doctor says that he has placed traverses and sleepers upon several lines of railway, and posts upon one line of electric telegraph for the government, and that all are still sound, though some have been in use six years. He receives, constantly, orders for such work. For railroad traverses, the price is from ten to twelve francs per metre cube, containing about ten traverses two and six-tenths metres long. The solution costs about eight sous the traverse, and handling about the same. The process is conducted in the woods, the logs laid side by side, (the large ends cut square by the saw, and arranged on the boundary lines of a square,) inclining from butt to branches. A trough communicating with the reservoir is carried all round the square, above the butts, and small tubes run from this to each butt; and, in long trees, to holes about the centres of the trees, expediting thus the impregnation. The junction of the tube with the tree is carefully packed with a piece of cloth. The liquid advances through the tree at about the rate of one metre in twenty hours; the railroad traverses requiring forty-eight hours. The drip (after passing through the wood) is nearly colorless. A saw-cut around the tree, to the depth of the sapwood, with a piece of cotton cord tied in it, carries off the drip from any part above it. This is led back to the reservoir, and pumped up in it, to be used again with new material.

Respectfully submitted.

P. V. HAGNER,
Brevet Major, First Lieutenant of Ordnance.
A.—Apportionment of arms to the militia for the year 1848, under the act of 1808, for arming and equipping the whole body of the militia.

<table>
<thead>
<tr>
<th>States and Territories</th>
<th>Date of return</th>
<th>For what year returns received</th>
<th>Number of militia</th>
<th>Number of arms apportioned in muskets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>Dec. 31, 1845</td>
<td>1845</td>
<td>44,665</td>
<td>333</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>June 15, 1848</td>
<td>1848</td>
<td>27,066</td>
<td>203</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Jan. 1, 1849</td>
<td>1849</td>
<td>102,664</td>
<td>766</td>
</tr>
<tr>
<td>Vermont</td>
<td>Jan. 1, 1844</td>
<td>1844</td>
<td>23,915</td>
<td>178</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Dec. 29, 1848</td>
<td>1848</td>
<td>13,653</td>
<td>102</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Dec. 1, 1846</td>
<td>1846</td>
<td>57,719</td>
<td>430</td>
</tr>
<tr>
<td>New York</td>
<td>Jan. 1, 1848</td>
<td>1848</td>
<td>178,574</td>
<td>1,332</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Dec. 2, 1829</td>
<td>1829</td>
<td>276,070</td>
<td>2,055</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Nov. 26, 1847</td>
<td>1847</td>
<td>9,229</td>
<td>69</td>
</tr>
<tr>
<td>Delaware</td>
<td>Jan. 13, 1839</td>
<td>1839</td>
<td>46,864</td>
<td>350</td>
</tr>
<tr>
<td>Maryland</td>
<td>Sept. 30, 1848</td>
<td>1848</td>
<td>132,905</td>
<td>9165-13</td>
</tr>
<tr>
<td>Virginia</td>
<td>Feb. 13, 1846</td>
<td>1846</td>
<td>79,448</td>
<td>592</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Dec. 15, 1846</td>
<td>1846</td>
<td>54,705</td>
<td>403</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Feb. 15, 1840</td>
<td>1840</td>
<td>57,312</td>
<td>427</td>
</tr>
<tr>
<td>Georgia</td>
<td>Jan. 15, 1848</td>
<td>1847</td>
<td>44,332</td>
<td>331</td>
</tr>
<tr>
<td>Alabama</td>
<td>Dec. 28, 1848</td>
<td>1848</td>
<td>43,823</td>
<td>327</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Jan. 24, 1848</td>
<td>1848</td>
<td>43,823</td>
<td>327</td>
</tr>
<tr>
<td>Mississippi</td>
<td>Dec. 1, 1848</td>
<td>1848</td>
<td>45,385</td>
<td>338</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Jan. 13, 1841</td>
<td>1841</td>
<td>71,252</td>
<td>531</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Feb. 13, 1841</td>
<td>1841</td>
<td>94,325</td>
<td>703</td>
</tr>
<tr>
<td>Ohio</td>
<td>Jan. 26, 1846</td>
<td>1846</td>
<td>176,455</td>
<td>1,316</td>
</tr>
<tr>
<td>Indiana</td>
<td>Apr. 4, 1833</td>
<td>1833</td>
<td>53,913</td>
<td>402</td>
</tr>
<tr>
<td>Illinois</td>
<td>Feb. 24, 1842</td>
<td>1842</td>
<td>130,219</td>
<td>896</td>
</tr>
<tr>
<td>Missouri</td>
<td>Jan. 7, 1845</td>
<td>1845</td>
<td>61,000</td>
<td>455</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Jan. 15, 1844</td>
<td>1844</td>
<td>17,137</td>
<td>128</td>
</tr>
<tr>
<td>Michigan</td>
<td>Dec. 1, 1848</td>
<td>1848</td>
<td>60,041</td>
<td>448</td>
</tr>
<tr>
<td>Florida</td>
<td>Oct. 10, 1845</td>
<td>1845</td>
<td>12,192</td>
<td>90</td>
</tr>
<tr>
<td>Texas</td>
<td>Nov. 22, 1847</td>
<td>1847</td>
<td>19,766</td>
<td>147</td>
</tr>
<tr>
<td>Iowa</td>
<td>Nov. 30, 1840</td>
<td>1840</td>
<td>5,223</td>
<td>39</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Nov. 20, 1832</td>
<td>1832</td>
<td>1,249</td>
<td>9</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>Dec. 31, 1845</td>
<td>1845</td>
<td>2,287</td>
<td>14,615-13</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>1,960,203</td>
<td>14,615-13</td>
</tr>
</tbody>
</table>

Ordnance Department, Washington, November 1, 1849.

G. Talcott,
Brevet Brig. Gen., Colonel of Ordnance.
B.—Statement of the ordnance and ordnance stores distributed to the militia under the act of April, 1808, from the 1st July, 1848, to the 30th June, 1849.

2 12-pounder bronze guns.
53 6-pounder bronze guns.
2 4-pounder bronze guns.
2 13-pounder bronze howitzers.
61 carriages for field-artillery, with implements and equipments complete.
13 caissons, with tools and spare parts.
1 travelling forge.
8 sets of artillery harness, each for four horses.
5,967 muskets and appendages.
620 Hall's rifles and appendages.
3,709 percussion rifles and appendages.
312-pounder bronze howitzers.
2 12-pounder bronze howitzers.
2 4-pounder bronze guns.
17 24-pounder iron howitzers for flank defense.
20 barbette carriages, with implements, &c.
12 12-pounder siege and garrison carriages, with implements, &c.
17 casemate carriages, with implements, &c.
3 upper barbette carriages.
38 carriages for field-artillery, with implements, &c.
2 6-pounder block-house carriages, with implements, &c.
18 12-pounder mountain howitzer carriages, with implements, &c.
15 caissons, with tools and spare-parts.
18 travelling forges.
5 battery wagons.
39 sets of artillery harness, each for 4 horses.
10 sets of artillery harness, each for 2 lead horses.
750-cannon balls of different calibres.
150 shells of different calibres.
200 shells, strapped.
500 stands of canister shot.

501 extra cartridge boxes for infantry, riflemen, and cavalry.
288 extra brushes and picks.
96 extra waist belts.
178 extra cap pouches.
631 extra pair holsters and caps.
295 extra holster caps.
570 sabre belts for cavalry and horse-artillery.
113 sword belts for non-commissioned officers and musicians.
560 infantry belt-plates.
288 extra musket wipers.
144 extra musket spring vices.
288 extra musket ball screws.
13 extra 6-pounder rammers and sponges.
23 percussion cannon locks.
500 percussion primers.

ORDNANCE DEPARTMENT, Washington, November 1, 1849.

G. TALCOTT,
Brevet Brig. General, Colonel of Ordnance.

C.—Ordnance and ordnance stores issued to the army and to the several military posts for the year ended 30th June, 1849, viz:

23 6-pounder bronze guns.
8 12-pounder bronze howitzers.
18 12-pounder bronze mountain howitzers.
17 24-pounder howitzers for flank defense.
20 barbette carriages, with implements, &c.
12 12-pounder siege and garrison carriages, with implements, &c.
17 casemate carriages, with implements, &c.
3 upper barbette carriages.
38 carriages for field-artillery, with implements, &c.
2 6-pounder block-house carriages, with implements, &c.
18 12-pounder mountain howitzer carriages, with implements, &c.
15 caissons, with tools and spare-parts.
18 travelling forges.
5 battery wagons.
39 sets of artillery harness, each for 4 horses.
10 sets of artillery harness, each for 2 lead horses.

ORDNANCE DEPARTMENT, Washington, November 1, 1849.

G. TALCOTT,
Brevet Brig. General, Colonel of Ordnance.

END OF THE REPORT OF THE SECRETARY OF WAR.]
Practice tube proposed for Cannon by Deloigne.

Cylindrical Conical ball and stem.

Loaded ball proposed to replace the use of the stem.

Dutch Artillery.

Field axle.

№ 1.

№ 2.
That in use in Holland differs from this, in having the Cup of Varnish and the Receiver with the caps, on sliding plate - so that after the point have been dipt in the first - the second is brought underneath them by sliding this plate.
Prussian Wrought Iron Garrison Carriage.
Plan of Press Room and Charging Shed

Pressmen Cup magazines

Rack for Drying Cups

Table for Varnishing

Door

Window

Elevation of Sifting Machine

 liefge

Sketch of Varnishing Machine.
Berger's Lock of Three Pieces.

Sketch No. 1.

Section through A.B.

Hammer proposed for Percussion Arms

Sketch No. 3.

To prevent injury to the Cane by Snapping. Turn out the screw one thread, and the pressure comes upon the rim of the nose. When home, the end of it hits the Cup.
Ground plan of Rolling Room.

- Wrought Iron Rods
- Barrel Rollers
- Resh Bars
- Spindle
- Water tub
- Straightening Machine
- Needle Rollers

Vertical Section through centre of Barrel Rollers.