49TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { MIS. DOC. No. 52.

ANNUAL REPORT

OF THE

BOARD OF VISITORS

TO THE

UNITED STATES MILITARY ACADEMY,

MADE TO

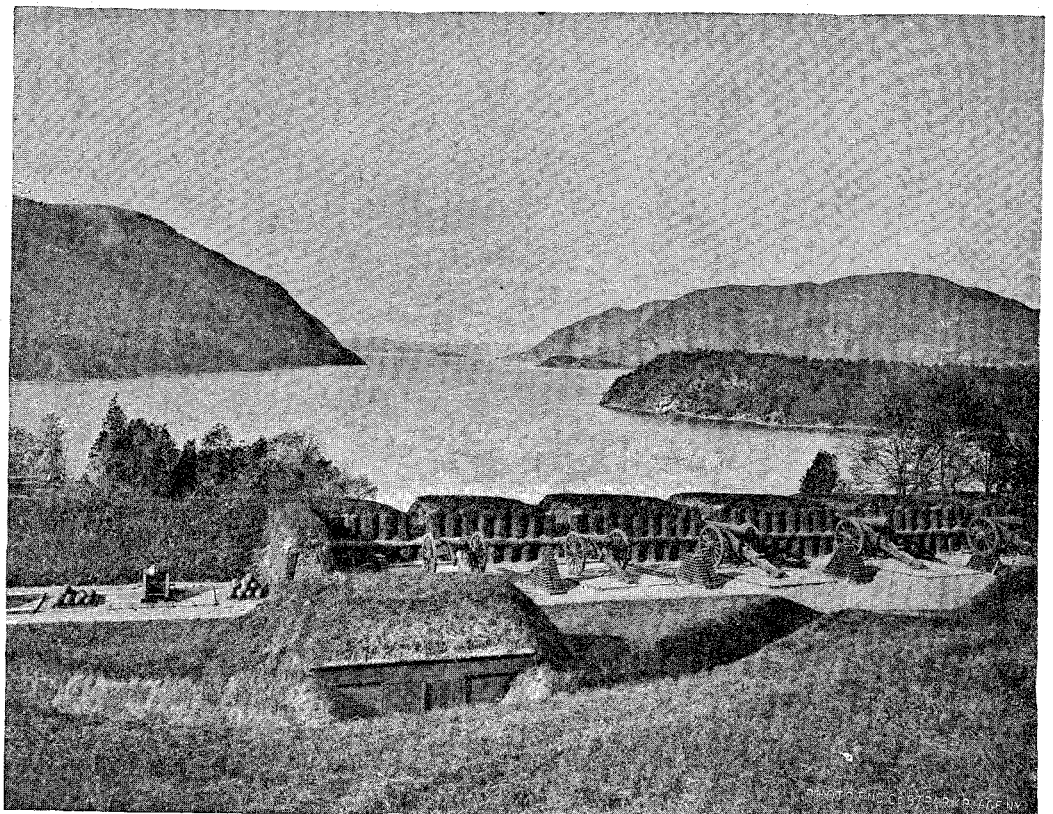
THE SECRETARY OF WAR,

FOR

THE YEAR 1886.

DECEMBER 22, 1886.—Referred to the Committee on Military Affairs and ordered to be printed.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1886.



VIEW FROM WEST POINT, LOOKING NORTH, WITH SIEGE BATTERY IN FOREGROUND.

REPORT

OF THE

BOARD OF VISITORS TO UNITED STATES MILITARY ACADEMY.

To the Secretary of War, the President of the Senate, and Speaker of the House of Representatives:

In accordance with the statute, the following report of the Board of Visitors to the United States Military Academy at West Point is herewith submitted.

The appointment, duties, and compensation of the Board of Visitors are set forth in the following sections of the Revised Statutes of the United States, to wit:

SEC. 1327. There shall be appointed every year, in the following manner, a Board of Visitors to attend the annual examination of the Academy. Seven persons shall be appointed by the President, and two Senators and three members of the House of Representatives shall be designated as visitors by the Vice-President or the President *pro tempore* of the Senate and the Speaker of the House of Representatives, respectively, at the session of Congress next preceding such examination.

SEC. 1328. It shall be the duty of the Board of Visitors to inquire into the actual state of the discipline, instructions, police administration, fiscal affairs, and other concerns of the Academy. The visitors appointed by the President shall report thereon to the Secretary of War, for the information of Congress, at the commencement of the session next succeeding such examination, and the Senators and Representatives designated as visitors shall report to Congress, within twenty days after the meeting of the session next succeeding the time of their appointment, their action as such visitors, with their views and recommendations concerning the Academy.

SEC. 1329. No compensation shall be made to the members of said Board beyond the payment of their expenses for board and lodging while at the Academy, and an allowance, not exceeding eight cents a mile, for traveling, by the shortest mail-route, from their respective homes to the Academy, and thence to their homes.

Section 1, act of Congress approved March 3, 1877, being an act making appropriations for the support of the Military Academy for the fiscal year ending June 30, 1878, provided that—

The expenses allowed by section thirteen hundred and twenty-nine of the Revised Statutes shall be paid as follows: Each member of the Board of Visitors shall receive not exceeding eight cents per mile for each mile traveled, by the most direct route, from his residence to West Point and return, and shall, in addition, receive five dollars per day for expenses during each day of his service at West Point.

MEMBERS OF THE BOARD.

The members of the Board of Visitors for the year 1886 were the following:

APPOINTED BY THE PRESIDENT.

Hon. KEMP P. BATTLE, LL. D	Chapel Hill, N. C.
Mr. WILSON S. BISSELL	Buffalo, N. Y.
General WILLIAM H. BLAIR	Bellefonte, Pa.
General GEORGE P. COSBY	Sacramento, Cal.
Prof. W. G. SUMNER	New Haven, Conn.
General FRANCIS T. NICHOLS	New Orleans, La.
Col. THOMAS C. MCCORVEY	Tuscaloosa, Ala.

APPOINTED BY THE PRESIDENT OF THE SENATE.

Hon. CHARLES F. MANDERSON	Omaha, Nebr.
Hon. RANDALL L. GIBSON	New Orleans, La.

APPOINTED BY THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

Hon. EDWARD S. BRAGG	Fond du Lac, Wis.
Hon. JAMES LAIRD	Hastings, Nebr.
Hon. EGBERT L. VIELE	New York City, N. Y.

ORGANIZATION OF THE BOARD.

The Board met for organization on the 2d day of June, 1886, elected General Francis T. Nichols, of Louisiana, president, and General George P. Cosby, of California, and Col. Thomas C. McCorvey, of Alabama secretaries.

The Board having notified the Superintendent of the Academy, General Wesley Merritt (colonel Fifth Cavalry, United States Army), of its organization, was waited upon by that officer, together with the staff officers, professors, and instructors, and the following programme of the examination submitted:

[Orders, No. 73.]

HEADQUARTERS UNITED STATES MILITARY ACADEMY,
West Point, N. Y., May 17, 1886.

I. The annual examination will begin on Tuesday, the 1st proximo, and continue daily (Sundays excepted), from 9 o'clock a. m. till 1 o'clock p. m. and from 2.30 o'clock p. m. till 4.30 o'clock p. m., till finished.

II. The Academic Board will be divided into two committees.

The first committee to be composed of—

The professor of natural and experimental philosophy;
The professor of drawing;
The professor of mathematics;
The commandant of cadets;
The professor of civil and military engineering; and
The instructor of ordnance and gunnery.

The second committee to be composed of—

The professor of modern languages;
The professor of chemistry, mineralogy, and geology;
The professor of history, geography, and ethics;
The professor of law; and
The instructor of practical military engineering.

The first committee will sit in the library, and examine orally—

(1) The first class in ordnance and gunnery.

(2) The first class in engineering.

(3) The third class in mathematics.

(4) The second class in natural and experimental philosophy.

(5) The first class in French.

And by written examination—

The fourth class in mathematics at 8 a. m. June 1, in room No. 23, academic building.

The third class in French at 8 a. m. June 2, in room No. 23, academic building.

By inspection of marks and drawings:

The second and third classes in drawing.

The second committee will sit in room No. 1, academic building, and examine orally—

(1) The second class in chemistry, mineralogy, and geology.

(2) The fourth class in French.

(3) The fourth class in English.

(4) The first class in Spanish.

(5) The first class in law.

By written examination—

(1) The fourth class in French, 8 a. m. June 2, in "mess hall."

(2) The first class in Spanish, 2 p. m. June 4, in room No. 23, academic building.

In all, the classes of oral examination will begin with the lowest sections, and the examination will be so conducted as not to interfere with the usual hours of meals of the cadets.

The Superintendent will preside in either committee with which he may be present.

III. After the completion of the examination of the first class in Spanish, the professor of modern languages will join the first committee, with a view to conducting the oral examination of the third class in French.

IV. As each committee shall complete its labors of examinations its presiding officer will report the fact to these headquarters.

V. First Lieut. John R. Totten, Fourth Artillery, and First Lieut. Frederick Wooley, Tenth Infantry, are appointed the secretaries of the second and first committees, respectively. The record of each committee will be so kept as to show clearly the length of time occupied in examination by each department of instruction.

At the close of each day's proceedings, the secretaries will report to the adjutant of the Academy the progress of the examination and they will transmit to the secretary of the academic board the records of the proceedings of the committees as soon as they are completed.

VI. The instructors will report daily to the heads of their respective departments and keep themselves informed as to the time the services will be required.

VII. The following military exercises will take place during the examination:

Exercise.	Subject.	Date.
		1886.
Infantry	Review	June 2
	School of the battalion	June 4
	Battalion-skirmish drill	June 8
Artillery	Siege-battery drill	June 1
	Mortar-battery drill	June 1
	Light-battery drill	June 3
Cavalry	Sea-coast-battery drill	June 5
	School-of-the-company drill	June 7
	School-of-the-battalion drill	June 7
	School-of-the-soldier mounted drill	June 7
Practical Military Engineering	Ponton-bridge building	June 9
	Spar-bridge building	June 11
	Military signaling	June 11
Ordnance	Practice with ballistic machines	June 11
Small-arms	Use of the sword and bayonet	June 11
	Military gymnastics	June 11

This "order of exercises" may be changed on account of the weather, or for other causes.

VIII. The members of the first class will be graduated June 12, 1886.

PROGRAMME.

The graduating class will proceed to the designated place, escorted by the Corps of Cadets, under the command of the commandant of cadets.

Prayer.
Music—United States Military Academy Band.
Address to graduating class.
Music—United States Military Academy Band.
Address of president (or member) of Board of Visitors.
Music—United States Military Academy Band.
Delivery of diplomas.
Music—United States Military Academy Band.
Benediction.

COMMITTEES OF THE BOARD.

In order to facilitate the labors of the Board and accomplish in the most practical manner the object of their appointment, it was decided to divide the duties by the appointment of four separate committees, each having in charge a special subject of investigation, as follows:

(1) A committee on discipline and instruction.

(2) A committee on police administration and fiscal affairs.

(3) A committee on ordnance and armament.

(4) A committee on buildings, grounds, and other matters not provided for in the other committees.

The said committees to be named by the president of the Board. Accordingly, the following gentlemen were named as constituting said committees:

(1) *Committee on discipline and instruction.*—Hon. Egbert L. Viele, Col. Thomas C. McCorvey, and Prof. W. G. Sumner.

(2) *Committee on police administration and fiscal affairs.*—Hon. Edward S. Bragg, Charles F. Manderson, and Kemp P. Battle.

(3) *Committee on ordnance and armament.*—Hons. James Laird, Randall L. Gibson, and General William H. Blair.

(4) *Committee on buildings, grounds, and other matters not provided for in other committees.*—Hons. Charles F. Manderson, Wilson S. Bissel, and General George P. Cosby.

The various committees proceeded at once to the discharge of their respective duties, attending the examination of the different classes, inspecting the buildings devoted to the use of the institution, witnessing the drills and evolutions in the several arms of the service, infantry, cavalry, and artillery, and the practical exercises in engineering.

At the invitation of the Superintendent, some of the members took part in the examinations by asking questions during the recitations.

Believing that a more practical result would be attained by submitting a joint report of the result of their labors than by two distinct re-

ports (as called for by the statute), the Board decided to act as an "homogeneous body"—all the members contributing through their several committees their individual share of observations on the condition of the institution and their views upon its management—the whole to be embodied in one report to the Secretary of War and to Congress, and the Hon. Egbert L. Viele was requested to prepare this report.

REPORT.

The object and purposes of the establishment of the United States Military Academy are too well known to require reference at this time. Its conception originated in the wise and thoughtful mind of George Washington, and it has been fostered with almost religious care from its foundation to the present time. The fortunate selection of the historic spot it occupies for its location has largely influenced its success, since no spot so isolated and yet so accessible could possibly be found possessing at the same time the advantages of a close connection with the "outside world."

It is, by virtue of its topographical position, so entirely removed from the realms of commerce and trade and of population that no extraneous influence can be brought to bear to disturb its quiet seclusion as a place of study or mar the effect of its enforced discipline.

In pursuing its investigations the Board, having in view the practical value of the institution to the country and its economical administration, deemed it necessary to ascertain—

1. If the discipline exercised on the cadets is in accordance with justice and humanity, and if its effects upon the individual results in developing and maintaining a high tone of morality and manhood.

2. If the course of instruction is in keeping with the advancement of knowledge, and especially if the improvements occurring all over the world in the art and science of war are recognized and taught.

3. Whether the system adopted for the conduct of the fiscal affairs of the institution is calculated to secure the best results through a judicious and economical expenditure of the moneys appropriated for that purpose.

METHODS OF APPOINTMENT OF CADETS AND THE RESULTS.

There are allowed by law, through the nomination of members of Congress, one cadet for each Congressional district and ten appointments by the President, making the legal number at present 344 cadets. There are now at the Academy only 269 cadets, arranged in classes as follows:

First class	77
Second class	67
Third class	51
Fourth class	74
Total	269

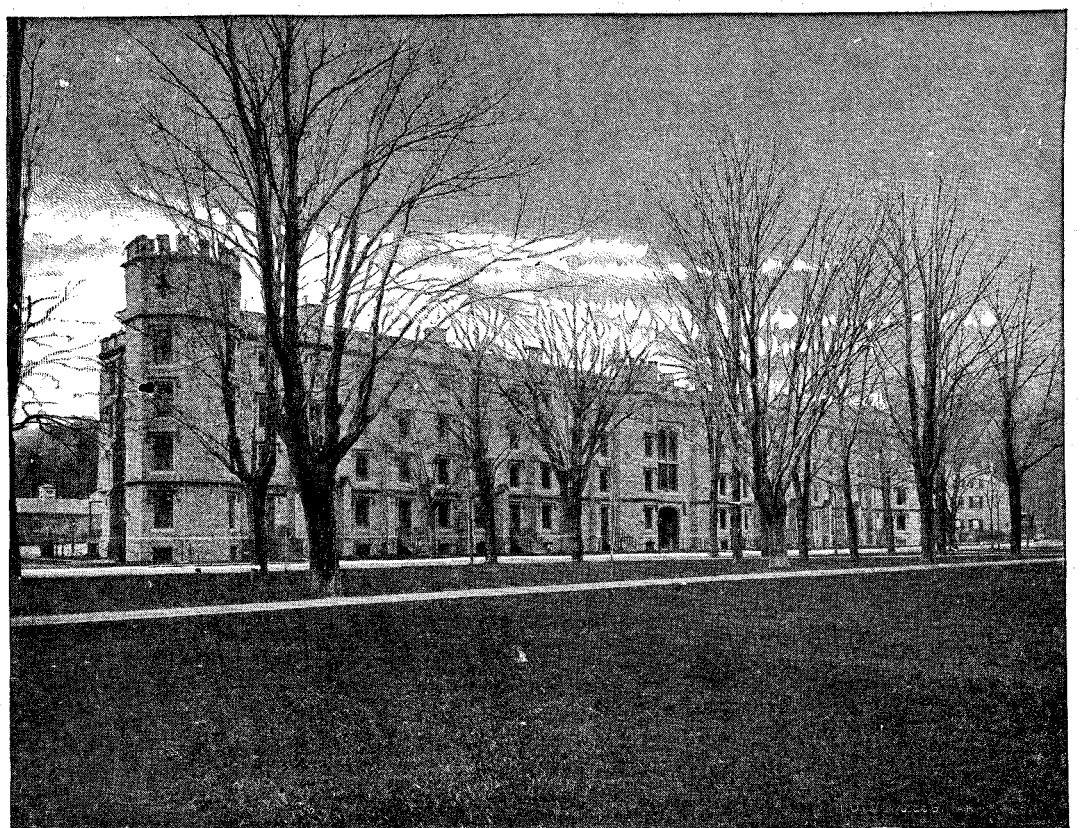
This shows a deficiency in the maximum number allowed of 75 cadets; that is to say, there are 75 vacancies in the corps as now organized. When the present first class graduates, on the 12th instant, there will be 77 more vacancies, making 152 in all. To fill these vacancies 136 candidates for admission have been named, which will still leave 16 vacancies, even should all of those who present themselves for admission pass both the physical and mental preliminary examinations, while experience has shown that at least 24 per cent. fail. To supply the possible failure of some of these, 31 alternates have been appointed to be examined in case the principal appointee in the particular district from which they are appointed should fail. These alternates will have the effect to reduce the percentage of failure in the preliminary examination, but there will, in all probability, remain from 34 to 40 vacancies in this class when it begins the academic year. Adding to this about 50 per cent. who fall out of every class between the time of entering and graduating, there would be left a large and increasing diminution in the strength of the corps during each year. It was probably in view of this fact, among others, that Congress, by a law since repealed, authorized the President to appoint ten cadets "at large" each year. This authority is now limited to ten appointments of this character in four years.

Recognizing the fact that the pay of an individual cadet is small compared with the total expenses of the Academy, the Board consider that it would be an act of sound public policy to give to the President the authority to appoint ten cadets each year, not only as a means of maintaining the strength of the corps, but also of providing for many deserving young men who can in no other way secure admittance to the Academy.

It was probably intended by conferring this power upon the President to afford an opportunity for the appointment of sons of officers of the Army, who, by reason of their duties, had no permanent residence in any Congressional district, and by a natural sequence the sons of those who served in the last war as "volunteers" have had their claims recognized in the number appointed by the President. The applicants for these appointments are very numerous, and the solicitations very pressing. If this number should be still further increased, by authorizing each United States Senator to name a cadet, it is believed that there would be still (through incidental circumstances) an average number of cadets less than the total number allowed by law.

The great value to the "country at large" of the technical education acquired at West Point, unlike in its theory and practice to that of any other institution, cannot be overestimated.

So impressed was General Grant, after his very extraordinary experience as the head of the great Armies of the Republic with the value of the United States Military Academy to the nation, that he asserted as his firm conviction, as a matter of public policy, that the



CADET BARRACKS.

number of cadets should be increased to one thousand, from which an annual selection should be made of those required for military service, while the remainder of those graduating each year and not required for public service would, by being disseminated throughout the country, add to the ranks of the people men of scientific attainments for the arts in peace and "ready-soldiers" in the event of war.

The fact that the average number of vacancies in the Army list exceeds the number of graduates is an additional reason why the range of appointments should be extended.

Below will be found a table prepared by Lieutenant Simpson, showing the number of casualties making, directly or indirectly, vacancies in the Army which graduates of the Military Academy may be assigned to fill, and the number of such graduates for the last fourteen years. The table does not cover a longer period, because, in 1871 there was a considerable reduction in the number of regiments in the Army, and its strength since has been nearly uniform.

The number of casualties, taken from the official Army Registers, has been obtained as follows:

First. By counting the actual number of casualties in the Corps of Engineers and Line of the Army, and in those Staff Departments (Adjutant-General's, Inspector-General's, and Ordnance) in which vacancies are filled by appointment from the line; and excluding the Signal Corps, and the Medical, Quartermaster, Subsistence, and Pay Departments, as vacancies in these either cannot or need not be filled by appointment from the line. In cases where vacancies in the latter have been filled from the line, such vacancies have been counted.

Second. By counting the casualties on the retired list. As there are always more subjects for retirement than places for them on the list every vacancy on this list is soon filled by taking an officer from the active list. The retired list is open to the whole Army. The number of officers, vacancies among whom would cause vacancies among the second lieutenants of the Line or Corps of Engineers, is 1,830. The number of vacancies where this would not be the case is 380. The proportion is, therefore, about 4.8 to 1. Supposing that retirement is equal in the different branches of the service, 48 officers of the former class go upon the retired list to 10 of the latter, and therefore $\frac{48}{58}$ of the casualties on the retired list give rise to vacancies open to graduates, non-commissioned officers, and appointees from civil life.

The number of each graduating class is taken from the official Military Academy Register of the corresponding year.

1.	2.	3.	4.	5.	6.
Year.	Number of graduates corresponding to year.	Casualties causing vacancies available for graduates, of the Military Academy.	Total number of casualties on the retired list.	Forty-eight fifty-eighths of preceding column.	Sums of columns 3 and 5 giving total number of casualties providing vacancies for graduates.
1872	57	60	13	11	71
1873	41	69	9	7	76
1874	41	78	9	7	86
1875	43	47	9	8	55
1876	48	57	13	11	68
1877	76	64	10	8	72
1878	43	53	6	5	58
1879	66	25	5	4	29
1880	52	37	9	7	44
1881	53	44	12	10	54
1882	37	51	12	10	61
1883	52	47	23	20	67
1884	37	44	13	10	54
1885	39	37	21	18	55
Total	685	714	164	136	850
Yearly average	*49	.....	.....	.....	*61

*Nearly.

Comparing columns 2 and 6, we see that the average number of vacancies annually exceeds by about 12 the average number of graduates, and that an unusually large class merely helps supply deficiencies of other years.

DISCIPLINE OF CADETS.

The system of discipline carried out at the Academy is based primarily upon the Articles of War, supplemented by the Regulations for the Government of the Army of the United States and by the General Regulations for the United States Military Academy.

The General of the Army has supervision and charge of the Academy.

The Superintendent of the Academy, and in his absence the next in rank, has the immediate government and command of the Academy.

The professors and other heads of departments of instruction, and the officers in those departments, constitute the academic staff.

The commandant of cadets, and in his absence the next in rank in the tactical department, has immediate command of the battalion of cadets.

The cadet battalion is composed of four companies, each containing a portion of each of the four classes. An officer of the Army, detailed as assistant instructor of tactics, is assigned to duty with each company, and has the direct supervision of it. Each company is officered by a captain

and three lieutenants taken from the first or graduating class of cadets, a first sergeant and four line sergeants taken from the second class, and five corporals taken from the third class. Each and all of the officers named are expected and required to be at all times on the alert, when the cadets are on duty, to take notice of and promptly report any and every deviation from the rules and regulations prescribed for the general conduct of the cadet, and, if on drill or parade, any neglect to conform in every particular with the precise letter of the tactics. These reports are made to the commandant of cadets and by him submitted to the Superintendent, being also made public at parade by the adjutant or posted at the guard-room. Each cadet has an opportunity to make either a verbal or written excuse for the delinquency he may be reported for. If he makes no excuse it stands against him in the form of demerit marks; in addition to which he may receive additional punishment in form of confinement to his quarters, extra hours of guard duty, or the deprivation of certain privileges allowed to cadets in good standing. Should the offense be of a grave character he may be court-martialed and dismissed or receive some mitigated punishment. There are eight classes of offenses. The offenses in each class are specified in detail, and the number of demerit marks for each offense enumerated. Of the offenses of the first class receiving for each offense ten demerit marks there are enumerated twelve; of the second class receiving seven demerit marks, forty offenses are enumerated; of the third class receiving five demerit marks, seventy-six offenses are enumerated; of the fourth class receiving four demerit marks, one hundred and three offenses are enumerated; of the fifth class receiving three demerit marks, eighty-two offenses are enumerated; of the sixth class receiving two demerit marks each, seventy-five offenses are enumerated; of the seventh class receiving one demerit mark each, forty-three offenses are enumerated; of the eighth class or academic delinquencies there are forty-three offenses receiving from one to four demerit marks each. This makes a total of four hundred and eighty-four offenses, covering the whole range of carelessness, negligence, thoughtlessness, intentional and unintentional acts which a cadet may commit, and which all of the cadet officers of every grade, as well as all the Army officers or professors connected with the institution, are required to report promptly if observed by any of them.

If any cadet shall have a total number of demerits thus recorded, exceeding 125 for the time between June 1 and December 31, both dates inclusive, or exceeding 90 for the time between January 1 and May 31, both dates inclusive (no credits being allowed other than those belonging to the time considered), he shall be reported to the Academic Board by the Superintendent deficient in discipline, and the Board shall consider and act upon such a deficiency.

At the end of every month for which the number of demerit recorded against any cadet is less than 8, the difference between 8 and that number shall be deducted from his then existing record of demerit.

Cadets of the three upper classes who have no demerit standing against them for the period commencing June 1 and ending December 20, the proportional credit due in the latter month being considered, are usually allowed a Christmas leave of absence of three days.

Cadets who may receive leaves of absence under the provisions of Paragraph 81, General Regulations, who shall have 350 demerit for the two preceding years shall be detained ten days from the beginning of the encampment; those having 325 and under 350, eight days; those having 300 and under 325, six days; those having 275 and under 300, five days; those having 250 and under 275, three days; those having 200 and under 250, two days.

The greater portion of the demerit marks is due to minor and unintentional acts, which the cadet learns to avoid as he progresses in his term at the Academy. This is illustrated by the roll of the class graduating the preceding year, in which it is shown that more than half of the class had less than five demerit marks each, and nearly half the class had no demerit at all.

It is evident from the foregoing that the system of discipline is a very rigid one. Its Spartan severity has been open to criticism. It must be borne in mind, however, that the training at this national institution is in every sense a peculiar one, requiring peculiar methods. In the first place, the course of studies is of such a character as to require the closest and most uninterrupted attention, not only on account of the abstruse nature of the studies, but the absolute necessity there is for covering so much ground in such a comparatively short period of time. If habits of thoughtfulness and strict attention to even the slightest duty is not insisted upon with severity the mind loses its power to grasp the intricate problems placed before it. The work required cannot be accomplished except by incessant devotion to it. At the same time these young men, in addition to this scientific instruction, are being educated in a thorough knowledge of military law, the first requirement of which is absolute and implicit obedience. "He who would learn to command must first learn to obey" is an axiom in the military profession. What would be utterly disregarded in a civil institution may be a grave offense in a military school. Discipline that entails neither mental nor physical suffering cannot be too severe for a soldier, but under no circumstances should it be accompanied by the exhibition of personal animus. Nothing could be more reprehensible on the part of a superior officer. Nor should trivial offenses be magnified at the risk of making discipline ridiculous.

On the whole the impression given to the Board by the general conduct and bearing of the cadets is that of a thoroughly disciplined body of young men under perfect control, respecting themselves and one another, as well as the officers placed over them. They exhibit a modest demeanor and a manly tone, attending to their duties with promptness and alacrity. All bear every mark of a healthy and vigor-

ous mental and physical activity. Those who have been familiar with the institution in the past express the belief that the moral element is in advance of what it was in former years.

The Board feels that it is due to General Merritt and the tactical officers under him that they should express their unreserved approbation of the manner in which they have fulfilled the responsible task assigned to them.

INSTRUCTION OF THE CADETS.

There are three elements that enter into the consideration of the matter of instruction. These are (1) the subjects taught; (2) the text-books used; (3) the methods pursued.

In discussing the subjects taught we are met at the threshold with the fact that this is a purely technical school established and maintained by the Government for the sole purpose of instructing a certain number of young men free of charge in the art and science of war in order to fit them for military service. All considerations outside of this main idea are foreign to the question, and the Board has therefore only to determine whether the system adopted leads up in the most direct and practical manner to the result desired. In the first place it is clearly manifest that mathematics constitutes the groundwork and is the principal element of the entire four years' course. There are obvious reasons why this should be the case. Mathematics forms the basis of the exact sciences, and while the mere study of mathematics independent of their application is in itself a mental discipline regarded by a large number of educators as the best calculated to strengthen and develop the mental faculties, they contain at the same time those elements of fact and deduction upon which the higher branches of scientific study depend for their elucidation. In the art of war science is supreme. Exact science has brought it with the aid of invention to its present wonderful condition of development. The genius of man has reached to its supremest heights in the construction and use of the appliances of modern warfare. The barbaric methods by which the great captains of history and conquerors of the world attained their renown are now as impotent and obsolete as the bows and arrows of the Parthians or the war clubs of the Sandwich Islander. Pure and unadulterated science founded on mathematical exactness has replaced all other methods, and out of scientific thought and scientific experiments have been evolved those titanic guns and terrible explosives with which the nations of the earth now confront each other, and yet such is the intense activity of invention displayed throughout the world that a single year or a single month may exhibit an entirely new phase of the whole subject and develop new methods of attack or defense hitherto unthought of.

The system of instruction and the course of studies is in charge of eight professors, whose positions at the Academy are permanent (with

the exception of that of the department of law), eight assistant professors, who are officers of the Army, and liable to a change of detail generally every four years, thirty-eight instructors and assistant instructors, who also are officers of the Army, and liable to change of detail every four years. In order to exhibit the nature of the duties to which these several professors, assistant professors, and instructors are assigned, their names and duties are given below:

Department.	Name.	Nature of duties.
Natural and experimental philosophy.	Peter S. Michie	Professor.
	First Lieut. Arthur Murray, First Artillery.	Assistant professor.
	First Lieut. William B. Gordon, Ordnance Department.	Instructor.
	First Lieut. E. Stuart, Ordnance Department.	Do.
	First Lieut. Wallace Mott, Eighth Infantry.	In charge of observatory and astronomical observations.
Modern languages	George L. Andrews	Professor.
	First Lieut. Alex. Rodgers, Fourth Cavalry.	Assistant professor of the Spanish language.
	First Lieut. Eugene A. Ellis, Eighth Cavalry.	Assistant professor of the French language.
	First Lieut. William A. Simpson, Second Artillery.	Instructor.
	First Lieut. John R. Totten, Fourth Artillery.	Do.
	Second Lieut. Carver Howland, Fourth Infantry.	Do.
	Second Lieut. J. F. Reynolds Landis, First Cavalry.	Do.
	Second Lieut. Frederick S. Foltz, First Cavalry.	Do.
Drawing	Charles W. Larned	Professor.
	First Lieut. Henry A. Reed, Second Artillery.	Assistant professor.
	First Lieut. William D. Beach, Third Cavalry.	Instructor.
	Second Lieut. Clarence P. Townsley, Fourth Artillery.	Do.
Mathematics	Edgar W. Bass	Professor.
	First Lieut. Wright P. Edgerton, Second Artillery.	Assistant professor.
	First Lieut. George L. Anderson, Fourth Artillery.	Instructor
	First Lieut. George H. G. Gale, Fourth Cavalry.	Do.
	First Lieut. Frederick Wooley, Tenth Infantry.	Do.
	Second Lieut. Edmund D. Smith, Nineteenth Infantry.	Do.
	Second Lieut. William W. Gibson, Third Artillery.	Do.
	Second Lieut. Walter S. Alexander, Fourth Artillery.	Do.
Chemistry, mineralogy, and geology.	Samuel E. Tillman	Professor.
	First Lieut. Walter S. Wyatt, Ninth Infantry.	Assistant professor.
	First Lieut. Thomas C. Patterson, First Artillery.	Instructor.
	Second Lieut. Frank S. Harlow, First Artillery.	Do.
	Second Lieut. John L. Chamberlain, First Artillery.	Do.
History, geography, and ethics.	William H. Postlethwaite, chaplain	Professor.
	First Lieut. Geo. B. Davis, Fifth Cavalry.	Assistant professor.
	Second Lieut. William P. Evans, Nineteenth Infantry.	Instructor.
Tactics	Lieut. Col. Henry C. Hasbrouck, captain Fourth Artillery.	Commandant of Cadets and instructor of tactics.
	Capt. Jacob A. Augur, Fifth Cavalry	Senior assistant instructor of cavalry tactics.
	First Lieut. William B. Homer, Fifth Artillery.	Senior assistant instructor of artillery tactics.
	First Lieut. Henry Kirby, Tenth Infantry.	Assistant instructor of tactics, commanding company of cadets.

Department.	Name.	Nature of duties.
Tactics—Continued.....	First Lieut. David Price, First Artillery.	Assistant instructor of tactics commanding company of cadets.
	First Lieut. Oscar J. Brown, First Cavalry.	Do.
	Second Lieut. Francis J. A. Darr, Twelfth Infantry.	Do.
	First Lieut. William D. Beach, Third Cavalry.	Assistant instructor of tactics.
	Second Lieut. John L. Chamberlain, First Artillery.	Do.
Law	Herbert P. Curtis, major and judge-advocate, U. S. A.	Professor.
	First Lieut. George B. Davis, Fifth Cavalry.	Instructor.
	Second Lieut. William B. Evans, Nineteenth Infantry.	Do.
Civil and military engineering.	James Mercur.....	Professor.
	First Lieut. Walter L. Fisk, Corps of Engineers.	Assistant professor.
	First Lieut. Gustav J. Fiebeger, Corps of Engineers.	Instructor.
	First Lieut. George W. Goethals, Corps of Engineers.	Do.
	First Lieut. James G. Warren, Corps of Engineers.	Do.
Ordnance and gunnery	Maj. Clifton Comly, Ordnance Department.	Do.
	First Lieut. Lawrence L. Bruff, Ordnance Department.	Assistant instructor.
	Second Lieut. William W. Gibson, Third Artillery.	On temporary duty.
Practical military engineering.	Capt. Philip M. Price, Corps of Engineers.	Instructor.
	First Lieut. James G. Warren, Corps of Engineers.	Assistant instructor.
	Herman J. Koehler	Master of the sword.

The following is the course of study and the text-books used at the Military Academy:

FIRST YEAR.—FOURTH CLASS.

[Books marked thus x are for reference.]

Department.	Course of study, text-books, and books of reference.
Mathematics	Davies' Elements of Algebra; Davies' Legendre's Geometry; Church's Plane and Spherical Trigonometry; Davies' Surveying; Church's Analytical Geometry.
Modern languages...	Keetel's Analytical and Practical French Grammar; Keetel's Analytical French Reader; x Spiers' and Surenne's Dictionary; Whitney's Essentials of English Grammar; Hart's Manual of Rhetoric and Composition; Abbott and Seeley's English Lessons for English People; Abbott's How to Write Clearly; x Webster's Dictionary.
History, Geography, and Ethics.	Lectures in Ethics and in Universal History.
Tactics of Artillery and Infantry.	Practical Instruction in the Schools of the Soldier, Company, and Battalion; Practical Instructions in Artillery.
Use of small-arms....	Instructions in Fencing and Bayonet Exercises and Military Gymnastics.

SECOND YEAR.—THIRD CLASS.

Mathematics	Church's Analytical Geometry; Church's Descriptive Geometry, with its Application to Spherical Projections; Church's Calculus; Church's Shades, Shadows, and Perspective; Chauvenet's Treatise on the Method of Least Squares.
Modern Languages..	Keetel's Analytical and Practical French Grammar; Borel's Grammaire Francaise; Bocher's College Series of French Plays; Roemer's Cours de Lecture et de Traduction, Vols. I and II; Spiers' and Surenne's Dictionary.
Drawing.....	Topography and plotting of surveys with lead-pencil, pen and ink, and colors; construction of the various problems in descriptive geometry; shades and shadows, and Linear Perspective and Isometric Projections; Practical Surveying in the field.
Tactics of Artillery, Infantry, and Cavalry.	Practical Instruction in the Schools of the Soldier, Company, and Battalion; Practical Instruction in Artillery and Cavalry.

THIRD YEAR.—SECOND CLASS.

Department.	Course of study, text-books, and books of reference.
Natural and Experimental Philosophy.	Bartlett's Mechanics; Bartlett's Astronomy; Michie's Elements of Wave-motion relating to Sound and Light.
Chemistry, Mineralogy, and Geology.	Bloxam's Chemistry, fifth edition; Everett's Deschanel's Heat, Part II; Tillman's Principles of Chemical Philosophy; Thompson's Elementary Lessons in Electricity and Magnetism; Dana's Mineralogy; Le Conte's Elements of Geology.
Drawing.....	Free-hand drawing and landscape in black and white; constructive and architectural drawing in ink and colors.
Tactics of artillery, infantry, and cavalry.	United States Army Artillery Tactics; Tidball's Manual of Heavy Artillery Service, United States Army; United States Army Cavalry Tactics; Upton's United States Army Infantry Tactics; Practical Instruction in the Schools of the Soldier, Company, and Battalion; Practical Instruction in Artillery and Cavalry.
Practical military engineering.	Myer's Manual of Signals; Practical and Theoretical Instruction in Military Signaling.

FOURTH YEAR.—FIRST CLASS.

Civil and military engineering and science of war.	Wheeler's Civil Engineering; Wheeler's Field Fortifications; Wheeler's Military Engineering (Permanent Fortifications, Siege Operations, and Military Mining); Wheeler's Elements of the Art and Science of War; Mahan's Stereotomy.
Modern languages...	Knapp's Spanish Grammar; Knapp's Spanish Readings; Seoane's Neuman and Baretti's Dictionary.
Law	Woolsey's International Law; Cooley's General Principles of Constitutional Law in the United States; General Orders No. 100, A. G. O., 1863; Ives's Treatise on Military Law.
History, geography, and ethics.	Swinton's Outlines of the World's History; Labberton's Historical Atlas.
Practical military engineering.	Practical Instruction in the Construction of Ponton and Spar Bridges, in the Preparation of Siege Materials, and in Laying Out Field and Siege Works; Practical Instruction in Astronomy, in Surveying, in Military Reconnaissances, in Field Telegraphy, and Night Signaling; Ernst's Manual of Practical Military Engineering; Myer's Manual of Signals.
Tactics of artillery, infantry, and cavalry.	Practical Instruction in the Schools of the Soldier, Company, and Battalion; Practical Instruction in Artillery and Cavalry.
Ordnance and gunnery.	Benton's Ordnance and Gunnery; Ordnance Pamphlets (Mordecai) Nos. 1, 2, 3, 4, and 5; Practical Pyrotechnics; Practical Ballistics.

The questions as to what text-books should be used in the instruction of the several classes is one of very great importance. These are decided upon by the Academic Board, and it may be asked, under the circumstances, if they alone are the best judges. The professors are greatly embarrassed in this particular by the desire on the part of each of them to make his own particular branch as thorough and complete as possible, and each endeavors to secure the most time for his special course. Nothing is more palpable than the fact that four years is not sufficient to impart all that the cadet ought to know. The exact sciences are not only the result of the accumulated thought and study of all the ages, but the present age is ripe with new and ever-increasing problems, all valuable, and a knowledge of them is for the most part a necessity to a scientific course. Just how to condense this information into a limited period of study, just where to leave off, are difficult questions to decide.

All this was made clearly apparent to the Board of Visitors at every step of their investigation. They would gladly, in this report, aid the Government with their suggestions in this most difficult problem, if it

were possible to do so. A single glance at the range of studies which forms the curriculum of the Academy is sufficient to show the embarrassment in the way. There is one fact, however, no less apparent to the Academic Board than to the Board of Visitors, and that is the necessity for remodeling the course in practical engineering. The text-books in use are not up to the knowledge of the day, nor do they grasp the subject-matter with the force that is required.

The cadet enters the first class, at the end of the third year, with his mind trained by three years of close study of abstract mathematics, and the last year's course should open to him a field for thought and observation outside of technical details. To this end it is believed that more time should be devoted by the professor to oral instruction and the stimulation of thought—the calling out, as it were, from the cadet of his latent faculties by free discussion outside of the text-book. In fact, if one day in each week (say Saturday) were devoted by each instructor in the section-room, in all the classes, to going over in advance the lessons of the week to come, the cadets would be materially aided in their efforts to grasp the problems before them. This course was pursued by one instructor some years ago, with such success that his section has not ceased to cherish the remembrances of his services to them to this day. The Board deems this matter worthy of careful consideration.

As the time of the professor of engineering is necessarily closely occupied with his duties during the whole academic term, it is suggested that an officer of engineers, experienced in field operations and especially qualified by thought and study for such duty, be detailed for duty at the Academy, to aid the professor of engineering in revising the course. It is believed that this would be the most expeditious and practical way of accomplishing what is imperatively needed—a better knowledge of the advanced condition of the art of war. And this should be done periodically, for the reason that text-books on this subject, having necessarily a limited circulation, are rare books, published only at long intervals, and are seldom in accord with the times in the information they contain.

Another feature of the present method of instruction seems to call for some remark. With the exception of the regular professors, eight in number, the whole corps of teachers, nearly fifty in all, are on temporary duty at the Academy, subject to constant change of detail. They are all officers belonging to the different arms of the service, ordered to duty at the Academy, sometimes by selection, sometimes at their personal request, and sometimes against their wishes. Most of them have been proficient while cadets in the several branches to which they are detailed as instructors. Their capacity for instruction, however, has had no opportunity for development, and consequently their being detailed for this duty is purely experimental. The question that naturally presents itself is this: Is not this experimental detail some-

what detrimental to those who are to be instructed? In other words, is there a sufficient element of instruction in this method?

A capacity for teaching does not always accompany the possessor of knowledge. The faculty for imparting information is a rare attribute of an intelligent mind. Simply to superintend in a perfunctory manner the monotonous study of the problems and formulas of a dry course of mathematics may aid the training and discipline of the mind, but it does not necessarily serve to quicken the intellect or stimulate original thought and reasoning.

It has at times happened that some officers have had enough occupation for their minds in the review of the course as presented for daily recitation, allowing them no time or inclination to go beyond that. What suggests itself to the Board, therefore, is this: Is sufficient care taken to secure special aptitude for teaching in this constant detailing and changing of nearly fifty instructors for the cadets? And when this special aptitude for teaching may be discovered, does it prevent the transfer of the officer to other duty, simply as a question of detail and nothing else? Are there not elements of error and possible injustice both to cadets and instructors in the present methods pursued?

Still another question presents itself to the Board in relation to the ethical course: Has experience shown that the text-books in this course are the best calculated to give to the minds of the cadets that polish which cannot be extracted from pure mathematics? Is there not lacking, at the end of the course, that habit of clear enunciation and that power of constructing the English language so essential to a finished education?

On the contrary, is there not developed, from one cause or another, a habit of hesitation in speech, a useless repetition of words, and a want of confidence in the methods and manner of stating conclusions to which the mind has arrived? Would not reading aloud selections from standard authors as a part of the daily recitations have a tendency to check this habit?

It is very possible that a certain feeling of nervousness and anxiety attending the ordeal of a rigid examination may have produced erroneous impressions on the minds of some of the members of the Board, who have felt it incumbent upon them to refer to this subject.

Looking at the whole subject of instruction from the standpoint of the examinations, the Board does not hesitate to express the opinion that these examinations evidence the diligence and conscientious zeal of the professors and instructors, and they show that the cadets as a rule have an earnest desire to acquire in a thorough manner all the knowledge of their future profession that they possibly can, and to acquit themselves with honor and credit towards their *alma mater* and the Government that is educating them.

FIELD EXERCISES AND MANEUVERS.

The Board was extremely fortunate in being favored with fine weather during the whole period of their stay at the Academy. This permitted the carrying out of the entire programme of the out-of-door exercises without interruption. The infantry, artillery, and cavalry drills embraced all the evolutions of those several arms of the service, and were executed in a faultless manner. Those of the cavalry and artillery especially, were conducted with so much dash and spirit, that at times it seemed as if some accident must happen, but nothing whatever occurred to mar the perfection displayed at each drill. A new field battery is, however, required.

The horsemanship exhibited by the cadets in the riding-hall was excellent, and an equal proficiency was shown in the gymnastic exercises.

The practice with the sea-coast battery was accompanied by great skill and precision in the handling of heavy guns, although neither the guns nor the methods were in accordance with modern improvements.

The rapid and orderly manner in which the pontoon bridge was constructed, and the ease and readiness with which the arduous duties of this drill were performed, is worthy of praise.

In fact, the Board would find great difficulty in suggesting terms of criticism in connection with any of the field exercises. It is somewhat remarkable that, with so much mental work to accomplish, the time could be found to arrive at such a degree of excellence in this branch of instruction.

It is evident, however, that this physical exercise, arduous and incessant as it is, must ncessarily be an important factor in the education of the cadet, as a simple counterpoise to the mental strain which the pressure of studies involves. It would be a very difficult matter indeed for the mind to stand this pressure without the accompaniment of the drills and maneuvers.

CADET ENCAMPMENT.

In connection with field exercises should be mentioned the encampment of the cadets during the summer months. Immediately on the close of the examination each year the cadets go into camp and remain there until the last of August, thus giving two and a half months to this very essential part of the education.

A member of the Board visited and inspected the camp with the view of including the result of such inspection in this report.

The camp ground is on the easterly side of the plain adjoining the site of old Fort Clinton, and overlooking the Hudson. It is laid out in accordance with the methods prescribed in the Regulations for the United States Army, and is arranged for the four companies constituting the cadet battalion.

In all the appointments of the camp nothing is omitted that is essential to a complete knowledge of this important element of military education. The camp is the habitat of the soldier in time of war. On its proper location and sanitary care depend his health and comfort, and on its thorough discipline depends the character, and often the safety, of the Army.

At the Military Academy it is the camp life that gives to the cadet that knowledge of military duties that renders this portion of his education as familiar as the alphabet to the language. These duties and methods, this discipline and instruction, he never forgets. They form a part of his nature, and when the necessity comes for him to make a practical use of the information thus acquired, he is never at a loss as to what course to pursue.

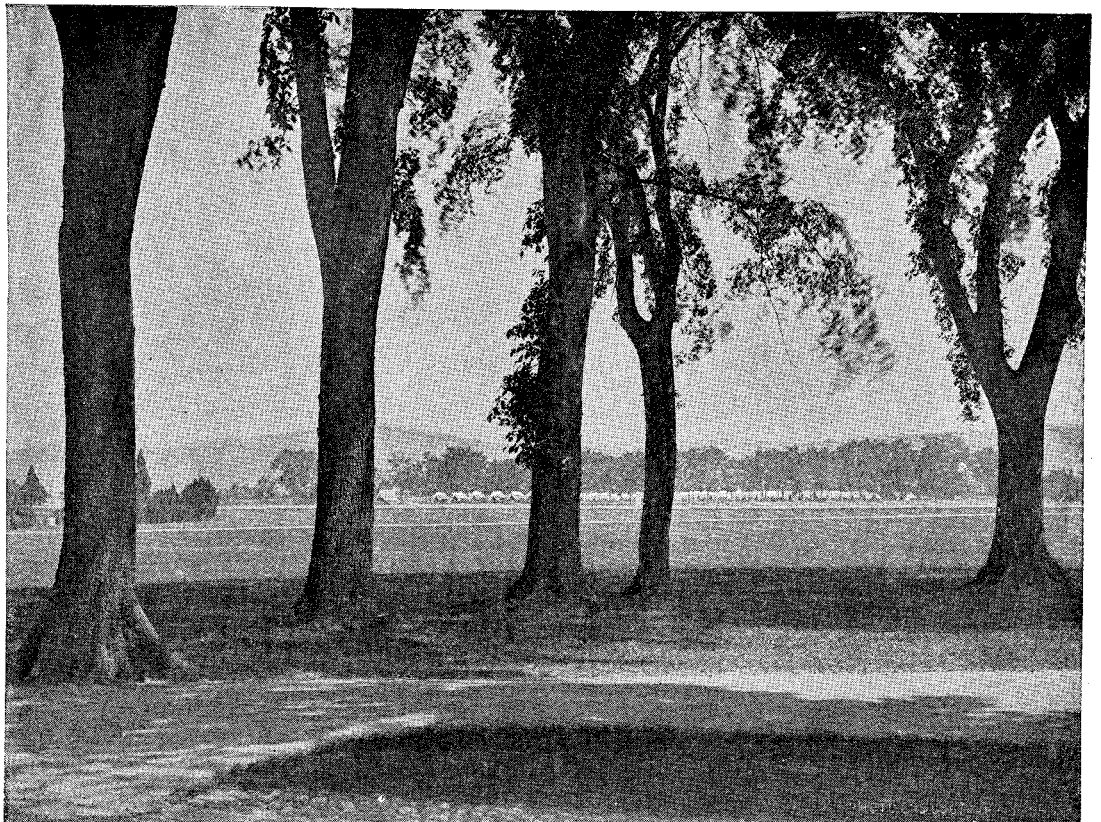
The drills in the several arms of the service during the encampment are continuous, test the endurance of the cadet to the utmost, and develop his physical condition in a manner such as nothing else could accomplish. His life during this period is in all respects that of a common soldier, and none of the duties of the soldier, no matter how trivial, are omitted. The commandant of cadets, and the four tactical instructors, occupy tents during the encampment, the same as the cadets, and the most assiduous efforts are made to make this portion of the course in every way complete.

PUBLIC BUILDINGS AND GROUNDS.

The land owned by the United States and reserved for public use at West Point consists of 2,200 acres, a comparatively small portion of which is occupied by the institution proper.

For the most part it is a wild, rugged tract, covered with forest trees, situated in the Highlands of the Hudson, where the river makes an abrupt bend, forming the projecting point from which the name of "West Point" is derived. The background is high mountain land, rising precipitately from the plain, which is a part of the ancient terrace of the river, and possesses a remarkable geological interest. The drift of the diluvial period has deposited in the gravel and boulder beds that form the upper stratum of the plain specimens of all the rocks and many of their mineral and fossil remains that are found in place for a distance of 250 miles to the north, and as those rocks embrace the whole series of the successive formations that constitute the earth's crust from the archæn to the latest quaternary, these deposits may be looked upon as so many pages of the great book of nature illustrating the history of the created world, transported by glacial action and mighty floods to this spot, selected for a national school of instruction. This plain or ancient terrace is what constitutes the local of the Military Academy.

At the sharp bend in the river, with two sides commanding the stream on the north and east, stands Fort Clinton, the old field work, restored



THE PLAIN, WITH ENCAMPMENT IN THE DISTANCE.

and preserved, that was thrown up originally by the patriots of '76. On the heights beyond are the ruins of old Fort Putnam, its crumbling casemates marking the ravages of time, and telling of the century that has gone by since sturdy heroes built here their citadel of defense, so nearly lost by treason's dastard act.

On all sides arise the statues and monuments that have been reared by loving hands to the memory of gallant soldiers who have died for their country. The very atmosphere is redolent of patriotism, honor, and chivalry. Surely there is nothing wanting here to stimulate to noble deeds.

The buildings are situated for the most part at the base of the mountain slope, while the broad level plain in front is devoted to the infantry exercises and evolutions of artillery and cavalry. The area in actual use does not exceed 200 acres. The topographical map accompanying this report exhibits that portion of the reservation in occupation.

Extensive as were the wise provisions made to secure that seclusion for the institution so essential to the maintenance of the discipline and training of the cadets, such has become the attractiveness of this region of country that population is crowding towards the Academy from the southward to a degree that it would seem advisable to secure if possible the tract immediately adjoining the reservation on the south, belonging to the Kingsley estate, to prevent an undesirable occupation of that property and a too close proximity of possibly injurious influence. There can be no question that the topographical location of the Academy has been one of the most successful elements in the education of the cadets, and the maintenance of its seclusion is of all things the most to be desired.

BUILDINGS.

The population of West Point, or those living on the Government property, consists almost exclusively of the cadets, their officers and professors, and the soldiers enlisted for special service in connection with the institution. Three classes of buildings have been erected for the use and purposes of the institution:

First. Those devoted to the exclusive use of the Corps of Cadets.

Second. Those assigned as quarters to the officers and professors.

Third. Those erected and designed for the use of the soldiers.

The first consists of the cadet barracks, mess-hall, riding-hall, academic building, library and astronomical observatory, cadet chapel, hospital, administration building, and commissary building. These are all in near proximity to each other, within a nearly quadrangular space on the southerly end of the plain. All are built of stone. The cadet barracks recently erected is an L-shaped four-story edifice, with two sally-ports. It faces to the north and west, with an open court in the rear, and verandas on the two inner sides. It is divided by lateral hallways into a series of double sets of quarters, four on each floor, sixteen to

each hallway. Each room is occupied by two cadets, generally members of the same class. The rooms are heated by steam and lighted with gas. Bath-rooms are provided in the basement, and every cadet is required to bathe a certain number of times each week, winter and summer. The mess-hall and hospital, also recently erected, are in every way adapted to the purposes for which they are designed, the mess for unmarried officers adjoining the cadet mess-hall. The library building requires remodeling and more room for the books it contains. The philosophical department, now occupying a portion of this building, should be provided with better accommodations elsewhere. The cadet chapel is not large enough and should be extended. The building for administrative offices and the riding-hall are ample for their uses. The academic building is in every respect unsuitable for the purposes required, and is in a dangerous condition, demanding *immediate* attention.

The lower floor, at one time used as a riding-hall, is now divided between the gymnasium and the department of chemistry, affording to neither the accommodation necessary. The two upper floors, used for section or recitation rooms and for the drawing classes, are liable at any time to collapse, from the insufficiency of the interior supports, and the building is at the same time in danger from destruction by fire, owing to its imperfect construction. No delay should be made in reconstructing this building. The plans submitted herewith show what is necessary to be done to render it suitable for the purposes intended. The recitation and lecture rooms, now used by the philosophical department, as well as those occupied by the department of chemistry and geology, are utterly inadequate. A new building devoted to these two departments is much needed.

No other institution of any rank in the country is so poorly supplied with these essential adjuncts to a scientific course of education.

At one time the Military Academy stood almost alone as a scientific school, while nearly all the colleges and universities of the country made the study of the classics the chief feature of their curriculum. Now, however, the study of the sciences has become an important element of education everywhere, and coincident with this development generous hands have come forward to aid by legacies and endowment the leading institutions of learning throughout the country in their efforts to promote the higher education of young men. This generous support was absolutely necessary, as without the requisite funds the large expense incident to this new departure could not have been met. The following table exhibits the enormous extent of this voluntary aid to education during the past ten years:

Statement showing aggregate amounts of gifts and legacies, from 1876 to 1885, inclusive, to several American colleges, &c.

Names and locations of the institutions.		1876 and 1877.	1878 and 1879.	1880 and 1881.	1882 and 1883.	1884 and 1885.	10 years, 1876 to 1885.
University of California.	Oakland, Cal	$700,000	$225,000	$75,000	$90,815	.....	$1,090,815
Yale College	New Haven, Conn.	20,500	191,727	445,970	553,000	$111,138	1,322,335
Wesleyan University	Middletown, Conn	27,301	150,000	394 400	2,000	32,604	606,305
Harvard University	Cambridge, Mass	270,049	330,341	555,500	1,001,449	145,951	2,303,299
Tuft's College	College Hill, Mass.	.....	14,000	155,000	169,000	36,036	374,036
Wellesley College	Wellesley, Mass	.....	155,000	205,000	.....	29,000	389,000
Washington University	Saint Louis, Mo	141,000	.....	248,600	20,000	169,000	578,600
College of New Jersey	Princeton, N. J	100,000	165,000	132,650	.....	269,536	667,186
Presbyterian Theological Seminary.	do	275,345	12,375	220,000	20,375	3,443	531,538
Cazenovia Seminary	Cazenovia, N. Y	75,000	20,000	95,000	10,500	.....	200,500
Columbia College	New York, N. Y.	.....	2,250	650,000	5,000	558,875	1,216,125
General Theological Seminary (Episcopal).	do	24,800	.....	106,000	128,106	66,187	325,093
Union Theological Seminary (Presbyterian).	do	32,000	109,000	103,000	100,000	305,000	649,000
University of Rochester	Rochester, N. Y	3,103	7,000	281,800	46,706	25 000	363,609
Rochester Theological Seminary.	do	.....	156,000	123,000	100,000	76,000	455,000
Union College	Schenectady, N. Y.	130,600	84,000	153,554	.....	.....	368,154
University of Pennsylvania.	Philadelphia, Pa	150,000	.....	200,000	142,782	86,324	579,106
Vanderbilt University	Nashville, Tenn	320,000	100,000	150,000	150,000	210,000	930,000
University of Vermont	Burlington, Vt	.....	185,375	58,150	23,000	105,000	371,525
University of Virginia	University of Virginia P. O., Va.	205,000	51,000	144,000	.....	490,000	890,000
Tulane University of Louisiana.	New Orleans, La	.....	.....	.....	1,500,000	500,000	.....
Aggregate for the schools above mentioned		2,474,698	1,958,068	4,496,633	4,062,733	3,219,094	16,211,226

For the whole of this period the Military Academy has received barely sufficient to maintain its normal condition, ignoring entirely the progressive developments at all the other centers of education. That this is a false economy and inconsistent with our national progress cannot be denied. What those great benefactors of their race who have devoted their wealth to the cause of education, like Stephen Girard, Peter Cooper, Johns Hopkins, Leland Stanford, Cornelius Vanderbilt, George Peabody, Paul Tulane, and others have done for the country at large Congress should be willing to do for its national schools, and that is to keep them up with the spirit of the age.

Large and munificent as have been these gifts to the leading colleges, the sum total of the contributions, great and small, to education at large in this country during the past ten years reaches nearly $60,000,000.* No stronger argument is needed to encourage generous liberality on the part of Congress towards the institutions of learning under its care.

The gymnasium, which has become so important a feature in the education of the cadets, is also entirely inadequate. Gymnastic exercises are so admirably adapted to develop the physical condition of the young men, and fit them for the arduous duties they will be called upon to perform in their future career, that a separate building, constructed especially for this purpose, and fitted with all the appliances requisite for thorough athletic training, is urgently demanded. The quarters of the officers are most of them buildings erected some years ago, that have from time to time been repaired and enlarged. They are now in tolerable repair and, together with the alterations authorized at the last ses-

*See Appendix "D."

sion of Congress to the old hospital building, are sufficient for present needs. The quarters occupied by the soldiers, located on the northerly slope of the Government grounds, have attracted the earnest attention of successive Boards of Visitors, and have been the subject of repeated and urgent recommendation. The truth is that these buildings and all the surroundings of this portion of the public grounds are simply a disgrace. The soldiers living here constitute an element of absolute necessity to the institution. Without their aid the education of the cadet could not well be accomplished. These soldiers should not only all be men possessing the highest physical and moral qualities of a soldier, but they should be encouraged to feel a pride in the duty assigned to them and a zeal in its discharge. Their quarters and the grounds around them should not only be suitable in every respect, but should possess all the appearance of order and neatness that characterize the buildings on the plain. A suitable appropriation for renovating the soldiers' barracks, for laying out and improving the grounds around them, for the construction of a proper building for the quartermaster's workshop and storehouse, and especially the substitution of a complete set of neat quarters for the married soldiers in place of the rookeries now occupied by them, and, in addition, a sufficient sum for perfecting the sanitary condition of the entire area devoted to the use of the soldiers, is demanded as of the first necessity. It has been found by experience at the Academy that married soldiers provided with quarters for their families are not only more steady in their habits, but, as a rule, more reliable and assiduous in their attention to duty. They become attached to the "Point" as their permanent home, and generally serve several terms of enlistment, thus giving to the Government the benefit of their experience and of the habits acquired by years of special training in specific duties. Hence the provision of comfortable quarters for these men is a matter of simple economy. The detailed report of the committee on public grounds, together with the correspondence connected therewith, affords valuable information on this subject, and is included in the appendix.*

The building used as a chapel for the soldiers is insufficient and unsuitable. The Board recommends an appropriation for a new building for this purpose, and also a small sum for its care and for the compensation of the clergymen of the different denominations who administer divine service.

No provision has heretofore been made for this purpose, although a number of cadets attend services at this chapel, some of them teaching the soldiers' children at Sunday-school.

INTERIOR POLICE AND DISCIPLINE.

The academic year begins on the 1st day of July of each year. At that time the cadets are in camp, where they remain until the 1st of

*Appendix A.

September; during this period the instruction is of a purely military character and includes all the duties of a camp performed in the most rigid manner, the cadets doing the most exacting duties of a private soldier, the new class being then in uniform and drilling with the other classes.

On the 1st of September the cadets return to barracks and the regular course of studies begins. The academic building, where the recitations take place, adjoins the barracks. The several classes are divided into sections of twelve, and each section has its particular section or recitation room.

For instruction in infantry tactics and military police and discipline the cadets are organized into a battalion of four companies, under the commandant of cadets, and assigned to quarters accordingly, each company being under the command of an officer of the Army, designated as assistant instructor of tactics.

The officers and non-commissioned officers are appointed by the Superintendent from a list submitted by the commandant of cadets. The selection is made from those cadets who have been most studious, soldier-like in the performance of their duties, and most exemplary in their general deportment. In general, the officers are taken from the first class, the sergeants from the second class, and the corporals from the third class.

When in barracks there is a military exercise for instruction every day when the weather is favorable (Saturdays and Sundays excepted), between 4 and 6 o'clock p. m. Each exercise continues at least one hour, and does not exceed one hour and a half. When in camp the exercises are at such times as may be directed.

The weather permitting, there is a dress parade at retreat daily, and at troop, when in camp, at such times as the Superintendent may direct.

There is an inspection of the battalion under arms every Sunday morning, when the weather permits. No military duty or exercise for instruction is performed on Sunday.

No cadet is allowed to be absent from any duty whatever without permission from the Superintendent, unless excused on sick-report.

Hours for daily duties.

Reveille at 5.30 o'clock a. m. in camp, and at 6 o'clock a. m. in barracks.

Police-call, 5 minutes after reveille, in camp, and 6.20 o'clock a. m. in barracks; and at 4 o'clock p. m. in camp, except Saturdays and Sundays, when it is at 5 o'clock p. m.

Surgeon's-call, fifteen minutes after reveille.

The signal for breakfast, at 6 o'clock a. m. in camp, and at 6.30 o'clock a. m. in barracks.

Troop, at 8 o'clock a. m.

The signal for dinner, at 1 o'clock p. m.

Retreat, at sunset.

Supper immediately after evening parade, except that at no time shall it be earlier than half past 5 o'clock p. m.

Call-to-quarters, in barracks, at 8 o'clock a. m., 2 o'clock p. m., and thirty minutes after return from supper; and on Sunday, morning call-to-quarters is sounded thirty minutes after inspection, and afternoon call-to-quarters at 3 o'clock p. m.

Tattoo, at 9.30 o'clock p. m.

Taps, the signal to extinguish lights, at 10 o'clock p. m.

Church-call, at 11 o'clock a. m. on Sundays.

POLICE ADMINISTRATION AND FISCAL AFFAIRS.

The police administration of the Academy is in a large measure maintained through the agency of the detachments of soldiers who are enlisted for special purposes connected with the institution. Of these there are—

Artillery detachment	114
Cavalry detachment	68

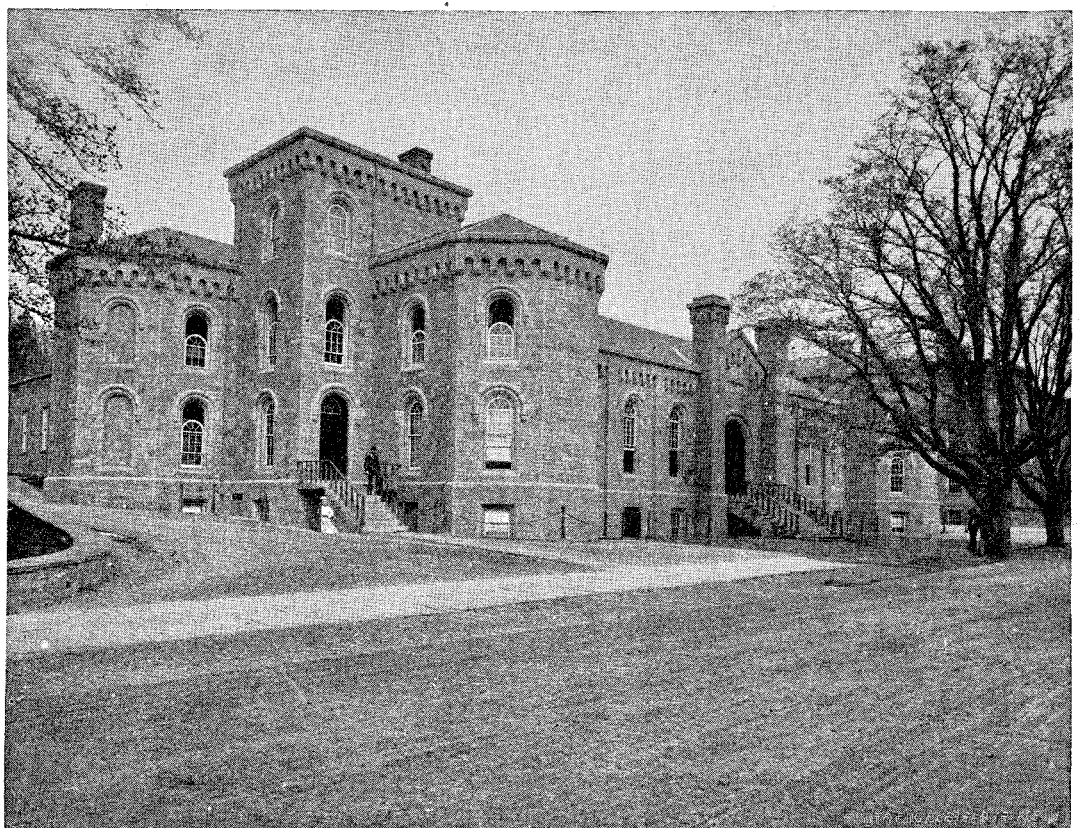
To which are added—

General-service clerks	4
Field music	14
Band	24

The cavalry detachment has charge of the horses used in cavalry and artillery drills, acting as riders in the latter. The duties of the artillery detachment are divided as follows:

Clerks	3
Overseers	4
School teachers	2
Mechanics (painters 4, carpenters 9, plumber 1, blacksmiths 3, tinsmith 1, masons 2, saddler 1, wheelwright 1, draughtsman 1, painter 1)	24
Laborers (18 are employed on general work in care of public grounds—about 200 acres—all roads, fences, and general police on the reservation; the balance of the 53 laborers are employed as watchmen, policemen, and in the various departments of instruction)	53
Teamsters	25
Detached service	1
Cooks for the detachment	2
Total	114

The most remarkable feature in the above list is that but 18 men are required in the general care of the public grounds of 200 acres in extent, while these grounds, as every one knows who sees them, are always in an admirable condition. Everything that is required for maintaining the sanitary condition and general cleanliness of the post, all the manual labor necessary in the different departments of instruction, in the care of the steam-heating apparatus, in the manufacture of gas, the water supply attending the bath-rooms, in short, the whole comfort and convenience of the Academy, its professors, officers, and cadets, the entire care of the public domain and Government property, is maintained by the industry of this small body of men under a system of



CADET MESS HALL.

police administration so well and so economically conducted that it is entitled to the warmest commendation. The most perfect order is maintained day and night, and everything in and around the institution exhibits at all times the regularity of clock-work.

FISCAL AFFAIRS.

The fiscal affairs of the Academy are in charge of Capt. William F. Spurgin, Twenty-first United States Infantry. This officer is quartermaster and commissary of cadets, and treasurer of the Military Academy. His duties embrace the receipt and expenditures of all moneys appropriated for the maintenance of the cadets.

The subcommittee states that the fiscal affairs were carefully and thoroughly investigated, the officer in charge rendering every facility to the committee to enable them to possess themselves of full information in reference to every expenditure however minute. The accounts are admirably kept and show at a glance the exact condition of the funds, and a detailed statement of expenditure. The committee present herewith a bimonthly statement of the accounts, to show the form in which they are kept.* These statements are made and the accounts are subjected to an inspection every two months by an inspecting officer of the post having no connection with the control or management of the funds.

The management of the post and cadet funds by the officer in charge deserves the highest commendation; the expenditures are made in such manner as will promote the comfort and welfare of the cadet. The supplies are purchased at the cheapest rates and no waste is permitted, every effort being made to utilize everything of value so as to increase the variety and quality of the rations for the cadets' mess, with a result highly satisfactory to the cadets, and general satisfaction exists where once grumbling held chief place.

It is not often that in positions of the kind held by the treasurer of the post and cadet fund the occupant is found so thoroughly devoted to his duty and to the interest given him in charge as in the case of the present treasurer at West Point.

The committee are fully satisfied with the management of the fiscal affairs given them to examine, and bear their testimony to the faithful administration of the treasurer. The duties of the fiscal officer include the very important duty of providing the necessary food for the cadets, and its proper preparation. No more responsible position could be held in connection with the Military Academy, and no one who is not peculiarly fitted for these duties could discharge them with satisfaction. There is nothing connected with the life of a soldier upon which so much depends as the proper cooking of his ration. At the same time, there is nothing a soldier suffers from more than badly cooked food. Indeed,

*See Appendix B.

it may safely be said that the cooks are the curse of the Army; they destroy more lives than the cannon of the enemy, and can do more to disable an army than a pitched battle. Even more important is this matter of cooking to the young men who are being trained for a soldier's life and a soldier's duties. The close and unremitting attention to study demanded from the cadet, as well as the constant drill and exercise to which he is subject, requires above all things that the food furnished to him should be of the most nutritive character and so prepared as to be readily digested. This has not always been the case at the Academy. For a number of years the furnishing of food to the cadets was let out by contract, with results that many look back upon with no other feeling than disgust. Badly cooked and tainted meat was more the rule than the exception. Meals served in a filthy manner, nauseating slops instead of properly prepared coffee and tea, rancid butter, and sour bread—these are some of the reminiscences which older graduates retain in their memories of their cadetship. To leave the table hungry and in disgust was a common occurrence, and what a gross wrong and injustice! How could it be expected that under such circumstances a cadet could study or perform his duties properly?

The present system is not only an immeasurable improvement on that of former years in the quality and preparation of the food, but, in addition, it is now served in a cleanly, orderly, and refined manner, in the place of the former offensive surroundings. The very odor of the old mess was revolting to an extreme degree. The present arrangement and conduct of the cadet mess seems to the Board of Visitors to be above criticism, and the economic management by which such a variety is secured at such a reasonable cost is certainly worthy of all praise.

Captain Spurgin undoubtedly possesses rare qualities for the duties to which he has been assigned. The eminent success of his administration of the commissary department could not have been accomplished without a peculiar talent, not readily found, and the Board unites in the recommendation that no change be made in this officer's detail so long as he is able and willing to perform his duty as he is now doing.

In reviewing the whole subject of public education as exhibited at the Military Academy, the Board have in mind the many discussions and numerous questions that have from time to time arisen in regard to the utility of the institution and the methods pursued, not only as to the admission of cadets but their subsequent education and training. Within the last few years there has been developed a tendency on the part of members of Congress, when called upon by the Secretary of War or Navy to nominate a cadet for the Military or Naval Academy, to open the selection to public competition, appointing a voluntary board of examiners for this purpose, and giving the appointment to the one standing highest on the list, instead of making an individual appointment. Not all the members of Congress, however, follow this rule.

It becomes a matter of interest, therefore, to determine what are the comparative merits of the two methods pursued. To this end the Superintendent of the Academy has caused to be prepared a table showing the relative standing of the cadets for those successive years embraced in the two methods of appointment.

From the following table will be seen how candidates appointed after competition and without competition have stood the test of the entrance examinations from 1873 to 1886, inclusive:

Years.	Competitive.		Direct.		Years.	Competitive.		Direct.	
	Admitted.	Deficient.	Admitted.	Deficient.		Admitted.	Deficient.	Admitted.	Deficient.
1873	57	16	61	58	1882	62	12	67	39
1874	26	10	63	56	1883	69	12	72	44
1875	46	20	75	47	1884	40	12	58	30
1876	38	11	60	42	1885	41	7	54	26
1877	46	27	50	60	1886	74	25	54	20
1878	40	6	62	39					
1879	46	13	42	21	Total	650	199	811	548
1880	32	10	41	24	Per cent	77	23	60	40
1881	33	18	52	42					

The following table shows the number of cadets admitted from 1873 to 1882, inclusive, exhibiting separately the number who have successfully graduated, as well as the casualties, under each mode of appointment:

Years of entering.	Total number admitted.	Appointed by competition.						Appointed directly.					
		Graduated.	Resigned.	Discharged.	Dismissed.	Died.	Total.	Graduated.	Resigned.	Discharged.	Dismissed.	Died.	Total.
1873	118	34	3	10	.....	.....	47	42	10	19	.....	.....	71
1874	89	13	4	10	1	.....	28	27	10	22	2	.....	61
1875	121	30	8	6	2	.....	46	34	18	22	1	.....	75
1876	98	23	4	16	.....	2	45	24	11	16	1	1	53
1877	96	36	4	11	.....	.....	51	20	8	13	4	.....	45
1878	102	22	7	13	1	.....	43	17	23	19	.....	.....	59
1879	88	29	4	14	.....	.....	47	13	14	14	.....	.....	41
1880	73	23	3	5	1	.....	32	14	12	15	.....	.....	41
1881	85	19	6	8	.....	.....	33	24	10	18	.....	.....	52
1882	129	40	7	12	.....	1	60	35	11	23	.....	.....	69
Totals	999	269	50	105	5	3	432	250	127	181	8	1	567

	Per cent.
Competitive:	
Graduated	63
Failed to graduate	37
Direct:	
Graduated	45
Failed to graduate	55

Thus showing that the percentage is in favor of competitive examination so far as intellectual capacity is concerned.

The point has also been raised that the tendency of the institution is undemocratic; that the methods of appointment and the course of

education develops an exclusive class, removed from the great body of the people, with associations and habits uncongenial and unadapted to republican institutions. It is therefore an additional matter of interest to learn the conditions of life from which these cadets have sprung; and as the best method of obtaining this information the occupation of the father of each cadet appointed during a certain period is selected as defining his social status at the time of entering the Academy.

Occupation of fathers of candidates for admission.

Occupations.	Number.	Occupations.	Number.
Author	1	Undertakers	4
Artist	1	Enlisted men	4
Auctioneer	1	Nurserymen	5
Brewer	1	Dentists	7
Butcher	1	Secretaries	8
Collector	1	Speculators	10
Conductor	1	Heads of corporations	10
Cook	1	Mining	11
Detective	1	Real estate	11
Distiller	1	Insurance	12
Inspector of police	1	Liverymen	12
Chief of police	1	Laborers	18
Saloon-keeper	1	Officers of volunteers	19
Superintendent of prison	1	Professors	21
Messenger	1	Ship-captains	22
Museum-keeper	1	State officers	23
Theater-manager	1	Members of Congress	23
Prison warden	1	Contractors	24
Wagon-master	1	Brokers	27
Tanner	1	Railroad	29
Steward	1	Engineers	34
Builders	2	Unknown	35
Musicians	2	Editors	39
Overseers	2	School-teachers	39
Policemen	2	Hotel-keepers	42
Politicians	2	Agents	47
Printers	2	Officers of the Navy	52
Architects	3	Officers of the Army	246
Barbers	3	Bankers and bank officers	55
Gardeners	3	Clerks	58
Journalists	3	County officers	61
Photographers	3	United States civil officers	69
Stock dealers	3	Manufacturers	93
Bakers	4	Clergymen	102
Lumbermen	4	No occupation	179
Millers	4	Mechanics	263
Presidents of colleges	4	Physicians	271
Publishers	4	Lawyers and judges	455
Superintendents of schools	4	Merchants	495
Surveyors	4	Farmers and planters	827

It will be seen that merchants, farmers, and lawyers form the great majority, while nearly all the trades and industries are represented from the lowest to the highest. The table is a complete refutation ot the charge of exclusiveness or favoritism in regard to appointments.

It has been further asserted that the qualifications required for admission and the standard of the preliminary examination are too high. What these requirements are is clearly set forth in the subjoined circular:

Information relative to the appointment and admission of cadets to the U. S. Military Academy.

APPOINTMENTS.

How made.—Each Congressional district and Territory—also the District of Columbia—is entitled to have one cadet at the Academy. Ten are also appointed *at large*. The appointments (except those *at large*) are made by the Secretary of War at the request of the Representative, or Delegate, in Congress from the district or Territory; and the person appointed must be an actual resident of the district or Territory from which the appointment is made. The appointments *at large* are specially conferred by the President of the United States.

Manner of making applications.—Applications can be made at any time, by letter to the Secretary of War, to have the name of the applicant placed upon the register that it may be furnished to the proper Representative, or Delegate, when a vacancy occurs. The application must exhibit the full name, exact age, and permanent abode of the applicant, with the number of the Congressional district in which his residence is situated.

Date of appointments.—Appointments are required by law to be made one year in advance of the date of admission, except in cases where, by reason of death or other cause, a vacancy occurs which cannot be provided for by such appointment in advance. These vacancies are filled in time for the next annual examination.

Alternates.—Should the Representative, or Delegate, in Congress have reason to doubt the success of his nominee in passing the entering examination, he can nominate a legally-qualified *alternate*. The alternate will be examined with the regular nominee, and admitted in the event of his success and the latter's failure to pass the prescribed preliminary examinations. The alternate, like the nominee, should be designated as nearly one year in advance of date of admission as practicable.

ADMISSION OF CADETS.

A candidate upon receiving his appointment is ordered to report at West Point to the Superintendent of the Military Academy in time to appear before the Academic Board for examination at its meeting early in June, unless there be good reasons for designating another time.

The candidate, soon after his arrival at West Point, is subjected to a rigid physical examination by a board of experienced surgeons of the Army. If he passes successfully this examination, he is then examined by the Academic Board. These examinations are made with as little delay as practicable after the candidate reports to the Superintendent.

The candidate who passes successfully these examinations is admitted, at once, to the Academy without returning to his home. In January following, he is subjected to another academical examination, and if he passes this one successfully, he receives a *warrant* as cadet and is required to sign articles binding himself to serve the United States eight years from the time of his admission to the Academy, unless sooner discharged.

Qualifications.—The age for the admission of cadets to the Academy is between seventeen and twenty-two years. Candidates must be unmarried, at least five feet in height, free from any infectious or immoral disorder, and generally from any deformity, disease, or infirmity which may render them unfit for military service. They must be well versed in reading, in writing, including authography, in arithmetic, and have a knowledge of the elements of English grammar, of descriptive geography (particularly of our own country), and of the history of the United States.

Each cadet, upon *his admission*, shall take the oath of office prescribed by law, and *before receiving his warrant* shall, in the presence of the Superintendent, or of some officer deputed by him, subscribe to an engagement in the following form:

[United States Military Academy.]

I, ——— ———, of the State of ———, aged —— years —— month , having been selected for appointment as a cadet in the Military Academy of the United States, do hereby engage, with the consent of my (parent or guardian), in the event of my receiving such appointment, that I will serve in the Army of the United States for eight years, unless sooner discharged by competent authority. And I, ——— ———, do solemnly *swear* that I will support the Constitution of the United States, and bear true allegiance to the National Government; that I will maintain and defend the sovereignty of the United States paramount to any and all allegiance, sovereignty, or fealty I may owe to any State, county, or country whatsoever; and that I will at all times obey the legal orders of my superior officers, and the rules and articles governing the armies of the United States.

——— ———.

Sworn and subscribed to at ———, this — day of ———, eighteen hundred and ——, before

——— ———.

CHARACTER OF EXAMINATIONS.*

PHYSICAL EXAMINATION.

Every candidate is subjected to a rigid physical examination, and if there is found to exist in him any of the following causes of disqualification to such a degree as would immediately, or at no very distant period, impair his efficiency, he is rejected:

1. Feeble constitution and muscular tenuity; unsound health from whatever cause; indications of former disease; glandular swellings or other symptoms of scrofula.
2. Chronic cutaneous affections, especially of the scalp.
3. Severe injuries of the bones of the head; convulsions.
4. Impaired vision, from whatever cause; inflammatory affections of the eyelids; immobility or irregularity of the iris; fistula lachrymalis, &c
5. Deafness; copious discharge from the ears.
6. Loss of many teeth, or the teeth generally unsound.
7. Impediment of speech.
8. Want of due capacity of the chest and any other indication of a liability to a pulmonic disease.
9. Impaired or inadequate efficiency of one or both of the superior extremities on account of fractures, especially of the clavicle, contraction of a joint, extenuation, deformity, &c.
10. An unusual excurvature or incurvature of the spine.
11. Hernia.
12. A varicose state of the veins of the scrotum or spermatic cord (when large) sarcocele, hydrocele, hemorrhoids, fistulas.
13. Impaired or inadequate efficiency of one or both of the inferior extremities on account of varicose veins, fractures, malformation (flat feet, &c.), lameness, contraction, unequal length, bunions, overlying or supernumerary toes, &c.
14. Ulcers, or unsound cicatrices of ulcers likely to break out afresh.

*It is suggested to all candidates for admission to the Military Academy that, before leaving their place of residence for West Point, they should cause themselves to be thoroughly examined by a competent physician, and by a teacher or instructor in good standing. By such an examination any *serious* physical disqualification or deficiency in mental preparation would be revealed, and the candidate probably spared the expense and trouble of a useless journey and the mortification of rejection.

It should be understood that the informal examination herein recommended is solely for the convenience and benefit of the candidate himself, and can in no manner affect the decision of the academic and medical examining boards at West Point.

NOTE.—There being no provision whatever for the payment of the traveling expenses of either accepted or rejected candidates for admission, no candidate should fail to provide himself in advance with the means of returning to his home, in case of his rejection before either of the examining boards, as he may otherwise be put to considerable trouble, inconvenience, and even suffering on account of his destitute condition. If admitted, the money brought by him to meet such a contingency can be deposited with the treasurer on account of his equipment as a cadet, or returned to his friends.

ACADEMICAL EXAMINATION.

Reading.—In reading, candidates must be able to read understandingly with proper accent and emphasis.

Writing and orthography.—In writing and orthography, they must be able, from dictation, to write sentences from standard pieces of English literature, both prose and poetry, sufficient in number to test their qualifications both in handwriting and orthography.

Arithmetic.—In arithmetic, they must be able—

1st. To explain, accurately and clearly, its objects and the manner of writing and reading numbers—entire, fractional, compound, or denominate.

2d. To perform with facility and accuracy the various operations of addition, subtraction, multiplication, and division of whole numbers, abstract and compound or denominate, giving the rule for each operation, *with its reasons*, and also for the different methods of proving the accuracy of the work.

3d. To explain the meaning of reduction—its different kinds, its application to denominate numbers in reducing them from a higher to a lower denomination and the reverse, and to equivalent decimals; to give the rule for each case, *with its reasons*, and to apply readily these rules to practical examples of each kind.

4th. To explain the nature of prime numbers, and factors of a number—of a common divisor of two or more numbers, particularly of their *greatest common divisor*—with its use, and to give the rule, *with its reasons*, for obtaining it; also the meaning of a common multiple of several numbers, particularly of their *least common multiple* and its use, and to give the rule, *with its reasons*, for obtaining it, and to apply each of these rules to examples.

5th. To explain the nature of fractions, common or vulgar, and decimal—to define the various kinds of fractions, with the distinguishing properties of each—to give all the rules for their reduction; particularly from mixed to improper and the reverse—from compound or complex to simple—to their lowest terms—to a common denominator—from common to decimal and the reverse; for their addition—subtraction—multiplication and division, *with the reason* for each change of rule, and to apply each rule to examples.

6th. To define the terms ratio and proportion—to give the properties of proportion and the rules, and *their reasons*, for stating and solving questions in both simple and compound proportion, or single and double rule of three, and to apply these rules to examples.

7th. The candidates must not only know the principles and rules referred to above, but they are required to possess such a thorough understanding of all the fundamental operations of arithmetic as will enable them to combine the various principles in the solution of any complex problem which can be solved by the methods of arithmetic. In other words, they must possess such a complete knowledge of arithmetic as will enable them to take up at once the higher branches of mathematics without further study of arithmetic.

8th. It is to be understood that the examination in these branches may be either written or oral, or partly written and partly oral—that the definitions and rules must be given fully and accurately, and that the work of all examples, whether upon the blackboard, slate, or paper, must be written plainly and in full, and in such a manner as to show clearly the mode of solution.

The following examples and questions in arithmetic are a few of those which have been used at past examinations. They are given in order to indicate more clearly what is required, but it should be distinctly understood that entirely different ones are used each year.

Multiply 4.32 by .00012.

Explain the reason for placing the decimal point in the answer [*The rule for so doing is not the reason.*]

Reduce $\frac{5\frac{1}{2}+\frac{7\frac{1}{2}}{0.5}-0.725}{\frac{4+3.45}{2\frac{1}{2}}}$ to an equivalent decimal.

Divide 3380321 by MDCCXCIX, and express the quotient by the Roman system of notation.

Change .013 to an equivalent fraction whose denominator is 135.

Find the greatest common divisor of $26\frac{1}{4}$, $28\frac{7}{8}$, and $29\frac{1}{6}$.

How many men would be required to cultivate a field of $2\frac{5}{8}$ acres in $5\frac{1}{2}$ days of 10 hours each, if each man completed 77 square yards in 9 hours?

Separate $772\frac{3}{8}$ in three numbers, which shall be in the same proportion as $2\frac{1}{2}$, $\frac{7}{10}$, $\frac{8}{15}$.

Five cubic feet of gold weigh 98.20 times as much as a cubic foot of water, and 2 cubic feet of copper weigh 18 times as much as a cubic foot of water; how many cubic inches of copper will weigh as much as $\frac{1}{9}$ of a cubic inch of gold?

Find the least common multiple for the numbers $\frac{3}{4}$, 2.1, 5.25, $\frac{7}{8}$.

A wins 9 games out of 15 when playing against *B*, and 16 out of 25 when playing against *C*. How many games out of 118 should *C* win when playing against *B*?

A and *B* run a race, their rates of running being as 17 to 18. *A* runs $2\frac{1}{3}$ miles in 16 minutes and 48 seconds, and *B* runs the entire distance in 34 minutes. What was the entire distance?

A and *B* can do a piece of work in 4 hours, *A* and *C* in $3\frac{3}{8}$ hours, *B* and *C* in $5\frac{1}{7}$ hours. In what time can *A* do it alone?

English shillings are coined from a metal which contains 37 parts of silver to 3 parts of alloy; one pound of this metal is coined into 66 shillings. The United States silver dollar weighs 412.5 grains, and consists of 9 parts silver to 1 of alloy. What fraction of the U. S. dollar will contain the same amount of silver as one English shilling?

Give the rule for reducing a decimal of a given denomination to integers of lower denominations.

What is the effect of dividing the denominator of a fraction by a whole number, and why?

Explain the difference between a common fraction and decimal.

What is the effect of annexing a cipher to a decimal, and why?

If the same number be subtracted from both terms of an improper fraction, what will be the effect? Why?

Give the rule for reducing a common fraction to an equivalent decimal, and explain why the resulting decimal will be equal to the common fraction from which it is obtained.

Give the rule for dividing one decimal by another, and explain why the decimal point in the quotient is placed where the rule directs.

Define reduction, and state the different kinds.

Grammar.—In English grammar candidates must be able—

1. To define the parts of speech, and give their classes and properties; to give inflections, including declension, conjugation, and comparison; to give the corresponding masculine and feminine gender-nouns; to give and apply the ordinary rules of syntax.

2. To parse fully and correctly any ordinary sentence, omitting rules, declensions, comparisons, and principal parts, but giving the subject of each verb, the governing word of each objective case, the word for which each pronoun stands or to which it refers, the words between which each preposition shows the relation, precisely what each conjunction connects, what each adjective and adverb qualifies or limits, the construction of each infinitive, and, generally, showing a good knowledge of the function of each word in the sentence. Omissions will be taken to indicate ignorance.

3. To correct in sentences or extracts any ordinary grammatical errors, such as are mentioned and explained in ordinary grammars.

It is not required that any particular grammarian or text-book shall be followed; but rules, definitions, parsing, and corrections must be in accordance with good usage and common sense. The examination may be written or oral, or both written and oral.

Geography.—Candidates will be required to pass a satisfactory examination, written or oral, or both, in geography, particularly of our own country. To give a candidate a clear idea of what is required, the following synopsis is added to show the character and extent of the examination. Questions are likely to be asked involving knowledge of:

1st. Definitions of the geographical circles, of latitude and longitude, of zones, and of all the natural divisions of the earth's surface as islands, seas, capes, &c.

2d. The continental areas and grand divisions of the water of the earth's surface.

3d. The grand divisions of the land—the large bodies of water which in part or wholly surround them.

Their principal mountains, location, direction and extent; the capes, from what parts they project and into what waters?

Their principal peninsulas, location, and by what waters are they embraced?

The parts connected by an isthmus, if any;

Their principal islands, location, and surrounding waters;

The seas, gulfs, and bays, the coasts they indent, and the waters to which they are subordinate;

The straits, the lands they separate, and the waters they connect;

Their principal rivers, their sources, directions of flow, and the waters into which they empty;

Their principal lakes, location, and extent.

4th. The political divisions of the grand divisions.

Their names, locations, boundaries, and capitals; general questions of the same character as indicated in the second section made applicable to each of the countries of each of the grand divisions.

5th. The United States.

The candidate should be thoroughly informed as to its general features, configuration, location, and boundaries (both with respect to neighboring countries, and latitude and longitude); its adjacent oceans, seas, bays, gulfs, sounds, straits, and islands; its mountain ranges, their location and extent; the sources, directions, and terminations of the important rivers and their principal tributaries, the lakes, and, in short, every geographical feature of the country as indicated above. The location and termination of important railroad lines and other means of communication from one part of the country to another should not be omitted.

The States and Territories are to be accurately located with respect to each other by their boundaries, and as to their order along the Atlantic Coast, the Gulf of Mexico, the Pacific Coast, the Northern frontier, the Mexican frontier, and the Mississippi, Missouri, and Ohio Rivers.

The boundary and other large rivers of each State, as well as all other prominent geographical features should be known.

The names and locations of their capitals, and other important cities and towns are likewise to be known.

In short, the knowledge should be so complete that a clear mental picture of the whole or any part of the United States is impressed on the mind of the candidate. More weight is attached to a knowledge of the geography of the United States than to that of all other countries combined.

History.—The candidate should make himself familiar with so much of the *History of the United States* as is contained in the ordinary school histories. The examination may be written or oral, or partly written and partly oral, and will usually consist of a series of questions, similar to the following:

I. Name the earliest European settlements within the present limits of the United

States—when, where, and by whom made? When did the settlements made by other nations than the English come under he Dominion of Great Britain, and of the United States?

II. What was the difference between the royal, the chartered, and the proprietary colonies? How many colonies were there originally in Massachusetts and Connecticut? When were they united? How many in Pennsylvania? When were they separated?

III. In what wars were the colonies engaged before the Revolution? What were the principal events and results of those of King William, Queen Anne, King George, and the French and Indian?

IV. What were the remote and the immediate causes of the American Revolution? Explain the navigation act, the stamp act, writs of assistance. When did the war of the Revolution properly begin? When, where, and how did it end? Give the particulars of Arnold's treason. Who were the most prominent generals in this war? Name the most important battles and their results.

V. The Constitution of the United States: Why and when was it formed? When was it adopted?

VI. Give the names of the Presidents of the United States in their order. Give the leading events of the administration of each one; for example, that of—

WASHINGTON.—Indian war; trouble with France; Jay's treaty; the whisky rebellion, &c.

JEFFERSON.—War with Tripoli; purchase of Louisiana; the embargo, &c.

MADISON.—War of 1812; its causes; the principal battles on land and sea; peculiarity of its last battle; when ended, &c.

MONROE.—Indian war; cession of Florida; Missouri compromise, &c.

JACKSON.—Black Hawk and Seminole wars; the United States Bank; nullification, &c.

POLK.—The Mexican war; its causes; principal battles; result of it, &c.

PIERCE.—Repeal of Missouri compromise; troubles in Kansas, &c.

BUCHANAN.—Civil war; how begun, &c.

LINCOLN.—War of secession; its causes; its results, social and political; explain doctrine of State sovereignty; alienation between Northern and Southern States; doctrine of secession; give an account of principal battles.

JOHNSON.—Fourteenth amendment; tenure of office bill; Johnson's impeachment.

GRANT.—Fifteenth amendment; Alabama claims and treaty of Washington; electoral commission.

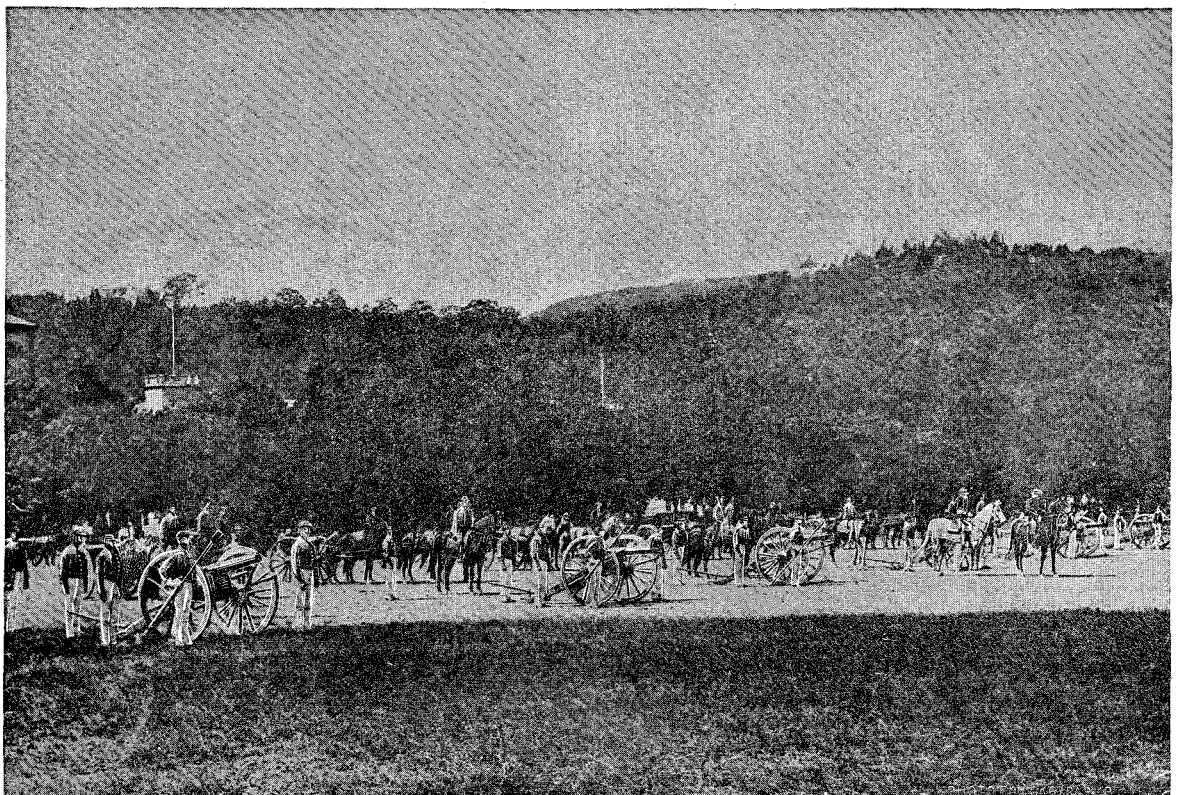
ACADEMIC DUTIES.

The academic duties and exercises commence on the 1st of September and continue until the 1st of June. Examinations of the several classes are held in January and June, and, at the former, such of the new cadets as are found proficient in studies and have been correct in conduct are given the particular standing in their class to which their merits entitle them. After each examination, cadets found deficient in conduct or studies are discharged from the Academy, unless the Academic Board for special reasons in each case should otherwise recommend. Similar examinations are held every January and June during the four years comprising the course of studies.

These examinations are very thorough, and require from the cadet a close and persevering attention to study, without evasion or slighting of any part of the course, as no relaxations of any kind can be made by the examiners.

Military instruction.—From the termination of the examination in June to the end of August the cadets live in camp, engaged only in military duties and exercises, and receiving practical military instruction.

Except in extreme cases, cadets are allowed but one leave of absence during the four years' course. As a rule, the leave is granted at the end of the first two years course of study.



CADETS AT FIELD-ARTILLERY DRILL.

PAY OF CADETS.

The pay of a cadet is $540 per year, to commence with his admission to the Academy, and is sufficient, with proper economy, for his support. No cadet is permitted to receive money or any other supplies from his parents, or from any person whomsoever, without the sanction of the Superintendent.

Cadets are required to wear the prescribed uniform. All articles of their clothing are of a uniform pattern, and are sold to cadets at West Point at regulated prices.

EXPENSES OF CANDIDATES PRIOR TO ADMISSION.

The expenses of a candidate for board, washing, lights, &c., after he has reported and prior to admission, will be about $10. Immediately after being admitted to the institution he must be provided with an outfit of uniform, the cost of which will be about $90, making a total sum of $100, which must be deposited with the treasurer of the Academy before the candidate is admitted. It is best for a candidate to take with him no more money than will defray his traveling expenses, and for the parent or guardian to send to *"The Treasurer U. S. Military Academy"* the required deposit of $100. Any deviation from the rule as to the amount or manner of making the deposit must be explained in writing, by the parent or guardian of the candidate, to the Superintendent of the Academy.

ASSIGNMENT TO CORPS AFTER GRADUATION.

The attention of applicants and candidates is called to the following provisions of an act of Congress approved May 17, 1886, to regulate the promotion of graduates of the United States Military Academy.

That when any cadet of the United States Military Academy has gone through all its classes and received a regular diploma from the academic staff he may be promoted and commissioned as a second lieutenant in any arm or corps of the Army in which there may be a vacancy and the duties of which he may have been judged competent to perform; and in case there shall not at the time be a vacancy in such arm or corps, he may, at the discretion of the President, be promoted and commissioned in it as an additional second lieutenant, with the usual pay and allowances of a second lieutenant, until a vacancy shall happen.

GENERAL QUALIFICATIONS.

A sound body and constitution, suitable preparation, good natural capacity, an aptitude for study, industrious habits, perseverance, an obedient and orderly disposition, and a correct moral deportment are such essential qualifications, that candidates knowingly deficient in any of these respects should not, as many do, subject themselves and their friends to the chances of future mortification and disappointment by accepting appointments at the Academy and entering upon a career which they cannot successfully pursue.

The Academy can in no sense be regarded as a primary school, or one of a beneficent character. The very nature of the institution is that of a school of instruction in those branches of technical knowledge relating almost exclusively to the science of war in order to secure men for the military service of the Government. Purely elementary knowledge must necessarily be acquired elsewhere. The task of education could not be accomplished in four or even six years if the rudiments were to be included in the course of study. It is interesting in this connection to show the extent and character of the previous education of the cadets now at the Academy, as indicating the average preparation of those who have successfully acquired a standing in their classes.

Cadets of the United States Military Academy, entering in 1883, showing time of attendance at school, time employed in private study, and time employed as teacher during the five years previous to admission to the academy.

CLASS OF 1887—ADMITTED IN 1883.

[This data was taken March 5, 1884.]

1883.	Time of attendance at school.						Time employed in private study.	Time employed as teacher.
	Public.		Private.		Normal school or academy.	University or college.		
	Common.	High.	Common.	High.				
	Yrs. Mos.	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*
1								2 0
2							1 0	
3				5 0				3 0
4		1 0	1 0				1 0	
5								
6		3 0					8	
7		2 8						
8		4 0						
9	3 0					2 0	1 0	
10		3 0						
11		1 0		2 8				
12							6	
13		2 0				1 0	1 0	
14					10	4		11
15		2 5						6
16					7½	1 0		
17					1 4			6
18						2 0		
19		2 0				7		1 0
20		1 0						
21				2 0		3 0		
22		1 8						6
23	1 0					1 5		
24		4 0						
25					4 0		6	
26			1 0			1 4		
27	2 0		1 3				10	
28	3 5		1 5					
29		4						
30								
31	2 3					2 0		
32						7	1	3
33						1 0	4 0	
34	2 0					4	4	
35		2 0						
36		1 4			8	1 8	1 0	
37					1 0			2 0
38				2 0		2 3		
39	3		2 11					
40	1 10	1 4				8		6
41					3 0			6
42	6						½	
43		3 0				1 8		
44	1 0						6	1 0
45		2 9			1 7	1 0	3 0	
46			3 0	2 0			3	
47	5					1 0	4	
48		10					2 6	8
49					1 5	2 0		
50		4 0					1 0	
51	3 0	6				8		
52	3 0							
53		5					3	
54					3 5			1 5
55			1 0	4 0				
56		1 0					3	
57			10	4			2	
58		2 0			3			
59	7			7			8	5
60		1 0			6	2 0		1 6
61				2 0		1 0		
62	1 1	7						10
63					2 0			
64		1 0		3 0				
65							½	
66					3 5	1 7		
67		3 5						
68						4		

Cadets of the United States Military Academy, &c.—Continued.

CLASS OF 1887—ADMITTED IN 1883—Continued.

1883.	Time of attendance at school.						Time employed in private study.	Time employed as teacher.
	Public.		Private.		Normal school or academy.	University or college.		
	Common.	High.	Common.	High.				
	Yrs. Mos.	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*
69		2 0		4				
70							¾	
71	1 0	4 0						2
72						2 0		
73		1 0						
74		3 0						
75				1 8				
76		2 0		1 4				
77		8	1 0		2 0	1 0		
78		10				10		3
79	1 0	8						
80				3				
81				2 5			2	
82		2 0				8		
83			1 0	1 0				
84	1 0	3 0						
85					1 9	1 6		
86				4 0				
87					4 0			
88		4 0				6	6	
89	1 0	1 0				2 5	6	
90			1 5			3 5	5	
91					4 0		1 0	
92				2 0	1 0	1 4		
93						1 10		1 6
94		2 0			3 0			
95		3 0	4				6	
96		3 0					2 1	
97	3					5		3
98		3 5		4		5		
99	1 0				2 0	6		
100	3 0	2 7						
101	1 0				3 0	6	3	

Candidates for admission to the United States Military Academy, showing time employed in private study during the five years previous to reporting at the Academy, and entire time of attendance at school, college, &c., and time employed as teacher.

CANDIDATES ADMITTED, 1884.

[Data given by candidates upon reporting.]

1884.	Time of attendance at school.						Time employed in private study.	Time employed as teacher.
	Public.		Private.		Normal school or academy.	University or college.		
	Common.	High.	Common.	High.				
	Yrs. Mos.	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*	*Yrs. Mos.*
1		3 0					3 0	3 0
2	3 0	3		1 0	2 0	1 0		
3	8 0	4 0					5	10
4	5 0			4 0				9
5	2 0	2 0	2 0	2 0		1 6	3	
6	8 0	6						
7	1 0	2 0	2 0				4	
8	6 0	1 0		1 0		1 0	(*)	
9			7 0		2 0		3	
10	6 0	1 0					6	
11	10 0				2		4	3 0
12	3 6				2 0			1 6
13	9			2 0		2 0	2 0	
14	5 0	1 6		3		9		
15	6 0	3 0		6			3 7	7
16	10 0					9	2 0	

*At intervals.

Candidates for admission to the United States Military Academy, &c.—Continued.

CANDIDATES ADMITTED, 1884—Continued.

1884.	Time of attendance at school.								Time employed in private study.	Time employed as teacher.
	Public.				Private.		Normal school or academy.	University or college.		
	Common.		High.		Common.		High.			
	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.	Yrs.	Mos.
17	3	0			1	6			3	0				2		
18							14	0								
19	7	0	4	0										4		
20	6	0					5				1	3		6		
21	6	0	2	0	1	0										
22							3	0	1	6						
23	5	0								5			1	0		
24	7	0		8		6					1	1		3		5
25	6	0	3	0	1	6					3	0		$\frac{3}{4}$		
26	5	0	3	0										3		
27					2	0			2	0	1	0	1	0		
28	1	6					7							6		
29		5	3	0										1		4
30	4	0	3	6	3	0										
31	4	0	4	0			3									
32	1	0			2	0	5						1	0		
33	8	0					3	0								
34					7	0	3	0						$4\frac{1}{2}$		
35	2	6					4				4	0		1		
36							5	0			4	6		$2\frac{1}{2}$		
37	2	0	4	0												
38	4	0			3	0	4	0						5		
39	4	6	1	6	1	6					3	0				
40	6	0	2	6	4	0										
41	11	0														
42	3	0	1	0	2	0					1	6		3		6
43	3	0	4	0							4	0				
44	6	0	4	0							3	0				
45	8	0	3	0					1	0			2	0		4
46	5	0	6	0	3	0								6		
47	9	0	4	0									(*)			9
48	6	0	2	0	2	0								6		
49	5	0								3	2	0		4		
50	8	0	3	0	1	0					1	0				
51	11	0									3	0	2	0		3
52	6	0	1	0	1	0							5	0		
53	8	0									2	6				
54	7	0							4	0	2	0				
55	8	0	3	0										6		
56					1	0	4	0			3	0		8		
57	6	0	3	0								2				
58	10	0							2	0				6		
59	11	0	2	0									1	0		
60	5	0	4	0							1	6				
61	2	6									3	0		4		6
62	1	0					5	0				5		6		
63	5	0							4	0				3		
64	1	0			2	0			2	0				$\frac{3}{4}$		
65	10	0	2	0										2		8
66	6	0	4	0												
67			9	0									1	2		3
68	6	0									1	8		6		
69	7	0	4	0										5		
70	11	0	4	0												
71	9	0	1	0										$\frac{3}{4}$		7
72	2	0			1	0						9	1	6		
73	8	0	3	0				7						3		
74					4	0	1	0		8						
75							3	0			5	0				
76	3	0	3	0							2	0				
77	5	6									2	0		4		6
78		8			2	0							3	0		
79	5	0					2	0						11		
80	5	0							3	0	3	0				
81	5	0												2	1	0
82	6	0	1	0						2						$6\frac{3}{4}$
83	2	0	1	0	2	0								2		
84	7	0											2	6		3
85	4	0	1	0										1		7
86	7	0	4	0					4	0			1	0		
87		3			4	0	4	6						11		
88	9	0									2	4		2		

* At intervals.

Candidates for admission to the United States Military Academy, &c.—Continued.

CANDIDATES ADMITTED, 1884—Continued.

1884.	Time of attendance at school.						Time employed in private study.	Time employed as teacher.
	Public.		Private.		Normal school or academy.	University or college.		
	Common.	High.	Common.	High.				
	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.
89	6 0	2 0				1 0	3 0	
90	6 0	2 0				1 6		
91	8 0				6		3	
92			7 0		2	2 0		
93	8 0				5			
94	4 0	2 0				2 0		
95			1 6		3 6			
96		12 0						
97	5 0	2 0	1 0			3 0	3	
98	6	4 0				3 0		

CANDIDATES ADMITTED, 1885.

1	8	0		*4							2	
2	5	0			5	0			3	0		
3	8	0	1	0					1	0	6	1 0
4	2	0	2	0	4	0			3	0	2	2
5	2	0	2	0	5	0					2 0	
6	6	0	3	0							1	
7	7	0							2	0	3 6	2
8	11	0	1	6							(†)	
9	6	0	2	0							2	3
10	2	0	6	0								9
11	2	0	2	0	1	0					1 0	1 6
12	6	0	4	0					3			
13	2	0	3	0			1½				1½	6
14	5	0	2	0								
15					2	0	4	0			2	0
16							2	0	1	4		
17	6	0	1	0		6	1	0				
18	3	0	3	0	4	0					3	
19	3	0			4	0					2	
20	8	0	2	0							3	
21	10	0	3	0							2	
22	6	0	1	0							3	
23	7	0	2	0			4	0				
24	12	0	2	0							1	2
25	2	0		9	3	0					9	5
26	2	0			8	0						3
27	6	6							1	0	3 0	3 0
28	4	0			2	0			1	0	1 6	2 1
29	6	0									1 0	2 1½
30							9	0				2 5
31					5	0	1	2	1	6		3
32	8	0				6		4		7½		3
33	6	0	4	0							5	2 4
34	2	0	3	6	2	6						9
35	6	0	1	0								6
36	9	0	3	0	3	0						¾
37					1	1					10	1
38					3	0	7	0			2	0
39					3	6	2	6	2	0		6
40							8	0				2
41	3	6	2	0								6
42	8	0									2 0	1 6
43	11	0										3
44	(‡)			6						6		
45	5	0	1	0						2		1 0
46	4	0	4	0								6
47	9	0	1	6								
48					5	0	4	0				
49	5	0	1	0	2	0					6	4
50			(§)		(§)						2 6	2
51	8	0				6						
52	1	0	2	6	3	0						4
53									12	6		6
54					4	0			1	0		7 7

* Evening. † At intervals. ‡ During winter. § Studied with governess.

Candidates for admission to the United States Military Academy, &c.—Continued.

CANDIDATES ADMITTED, 1885—Continued.

1885.	Time of attendance at school.								Time employed in private study.	Time employed as teacher.
	Public.				Private.		Normal school or academy.	University or college.		
	Common.		High.		Common.	High.				
	Yrs.	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*	*Yrs.*	*Mos.*
55	6	0	2	3	4	0														
56	7	0							3	0							¾			
57	5	0	4	0	(*)						1	0			7					
58	6	0				4					1	2			6					
59	3	0									1	0	2	0						
60	7	0													1					
61					3	0	3	0	3	0					6					
62	5	0			9	0							2	0				½		
63					10	0							2	0						
64	8	0	3	0							2	0	1	0						
65	7	0	3	0				2½							4			4		
66											5	6			6					
67		6			10	0				6			1	0						
68					3	0	5	0			4	0			3					
69	12	0										4			3					
70	7	0	1	6		2½														
71	2	0	4	0									2	0			1	0		
72	5	0		6								2¾			5			10		
73		7											1	6						
74	2	0	1	0	2	0									5					
75	3	0			2	0			1	0										
76	11	0	3	0																
77	8	0											(†)							
78	8	0	2	0											2					
79	9	0	3	0									3	4			4	0		
80			2	0	3	0	2	0	1	0	2	0								
81	7	0	1	0									2	0						
82	8	0											4	0						
83	7	0	2	0								6			6					
84	7	0	3	0				3		6			1	0						
85					9	0					5	0	1	6						
86			(†)		(†)		(†)		3	0	3	0			1					
87	10	0										6	2	0			2	3		
88	6	0												3						
89	4	6					5	6												
90	8	0								2										
91	3	0	1	0	4	0			1	0					¾		1	0		
92		6					5	0				7	2	9			3	4		
93	9	0							3	0				11				8		
94	8	0	1	0										2						
95	3	0	2	0						9			1	3						

*Unknown. †At intervals.

CANDIDATES ADMITTED, 1886.

1	7	0	4	0										1						
2	7	0	2	0							1	0	1	0			1	0		
3	6	0	5	0									1	0						
4	6	0							1	0	1	0		4						
5	2	0			3	6					3	0		3½						
6	8	0	3	0													1	10		
7		2			5	0			2	0	5	0		7						
8	1	0			4	0							1	0						
9	7	0	3	0										1½						
10	1	6					4	0	1	0	2	0								
11	5	0					1	6			2	6		1½						
12	5	0	2	0							3	0		3						
13					6	0					2	0		3						
14	3	0	3	0	1	0								3						
15	4	0			1	0			3	0				1½						
16	8	6	1	6							3	0								
17	5	0	3	6	1	0								10						
18	2	0			1	0	4	0					5	5						
19	5	0							5	0				*3						
20	9	0	3	0										6						
21	8	0									2	0		3						
22	8	4	2	0		8				9										
23	9	0	4	0										1½						

*Two hours a day.

Candidates for admission to the United States Military Academy, &c.—Continued.

CANDIDATES ADMITTED, 1886—Continued.

1886.	Time of attendance at school.								Time employed in private study.	Time employed as teacher.
	Public.				Private.					
	Common.		High.		Common.		High.		Normal school or academy.	University or college.
	Yrs. Mos.		Yrs. Mos.		Yrs. Mos.		Yrs. Mos.		Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.
24	11	0										
25	7	0							4	0	1	0		1
26		4						2			1	0		
27	6	0								1	0		2	3
28	12	0	2	0							1	7		
29	10	0		8					4				6	
30		1			2	0	1	0	2	0			½	
31	3	0		¼					3	0	3	0	1	
32	5	6											5	
33	12	0											1½	
34	7	0	3	0				4					4	
35	7	6		1					1				¼	6
36	10	6							8				2	
37	9	9						2	10					
38	6	0							¾				2¼	
93					11	0					1	6		
40					6	0			7				4	
41					6	0								
42	9	0											¾	
43	9	0				6							1	0
44	6	0	3	0							1	0	½	2 0
45	9	0	1	0									3	2 0
46	3	0	2	6	2	0							3	
47	8	0	5	0									2	0		1½
48	8	0	3	0	2	0							4	
49	8	0	3	0									2	2 0
50	5	10	3	9									2	0		¼
51	6	0	1	0		2							*1	0		
52	7	0												
53	1	6		6	3	0	2	0			1	0	5	2
54	6	0	4	0										11
55	†8	0		10									(*)	
56	1	8	(‡)		(‡)		(‡)						*5	0		6
57	4	0	1	10									*4	0		¼
58	4	2		4					4				1	8	1	11
59	5	0	4	0										
60	8	0											2½	1	9½
61					5	0	1	0	5				3	
62	7	0							1	0			5	
63	5	0									4	0		
64	8	0											6	5
65	9	0						2½						3
66	‖8	0			6	0			6		4			5
67	8	0	3	0				6					1	0
68	7	6									2	0	1	0
69	6	0							3	0			2	3 0
70	(§)				2	0	4	6			2	0		
71	6	0			1	1								10
72	8	0	4	0				9					1	0
73	6	0	3	6	1	0			3		1	6		
74					6	0	4	0				6	3	
75	8	0									2	6	1	0		5
76	1	6			2	0					4	0		3½		1
77	6	0	4	0									1	0		
78		1							4		6	0	5	
79	12	0											1	
80					2	0			7	0			1	
81	6	0	4	0									5	
82	7	0			1	1					1	5	4	
83	8	0	3	10½									1	0		1
84		6			4	0		6	4			8	6	
85	11	3	3	0						1½			2		6
86	1	0				5			3	0				¾	
87	5	0	1	0		3		4					8	
88	1	0	2	0	6	0							3	
89	2	0	(‡)				2	3					3	
90	6	0	4	0										
91	9	0	4	0										
92	4	0									3	6	3	
93	3	0	2	6		6							6	

*At intervals. ‡Studied at home. §Five months in each.
†Six months in each. ‖During winter.

Candidates for admission to the United States Military Academy, &c.—Continued.

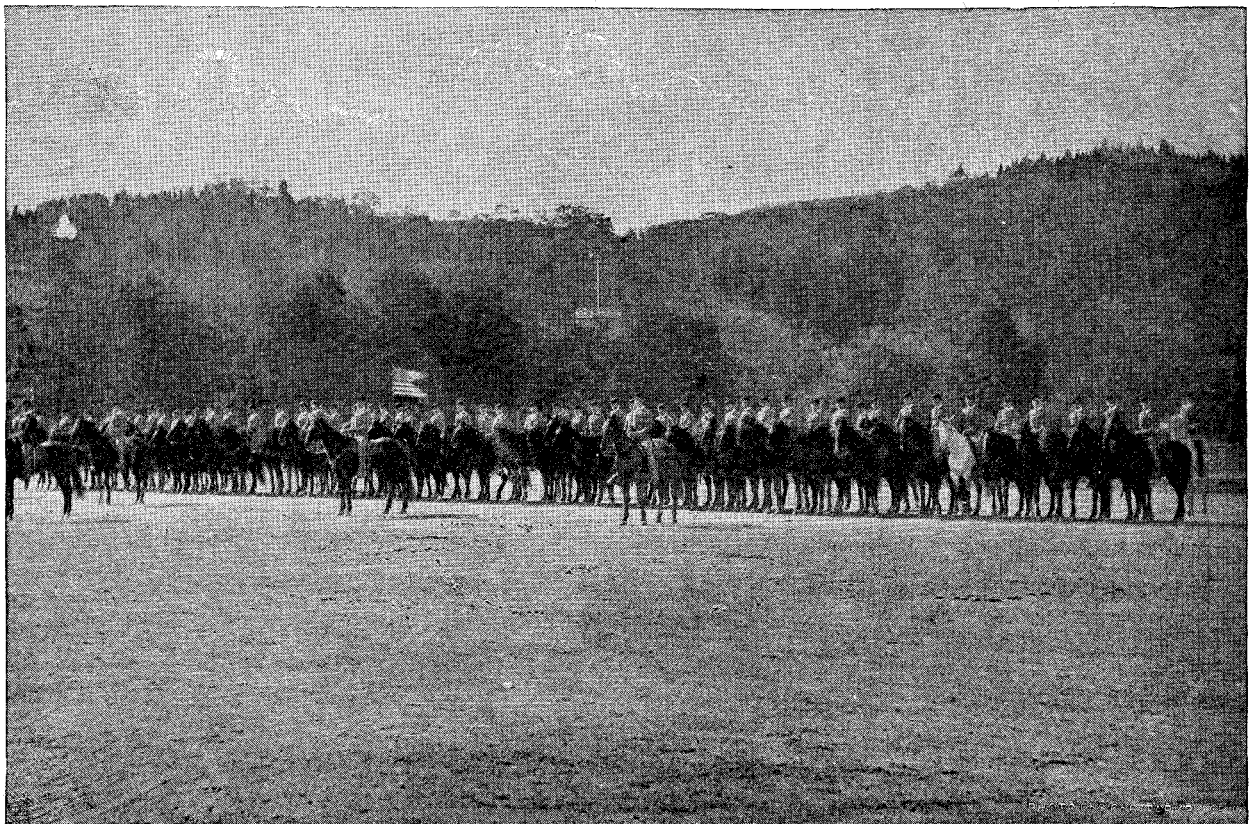
CANDIDATES ADMITTED, 1886—Continued.

1886.	Time of attendance at school.				Time employed in private study.	Time employed as teacher.
	Public.		Private.		Normal school or academy.	University or college.		
	Common.	High.	Common.	High.				
	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.	Yrs. Mos.
94	9 0	1 0		2½				
95	5 0	4 0				1	1 8	
96	9 0	3 0						
97	2 6				1 0		6	6
98	6 0	4 0					1 0	6
99			5 0		3 0	1	3	
100	7 0	3 0					3	
101			5 0				3 0	
102			9 0		1 0		4	
103			2 0	4 0	4 0	1 0	½	
104	10 0	1 0	1 0			1 0	1 0	1
105	7 0	3 0						
106	4 0	1 0			3 0		(*)	
107	10 0				3 0		1 0	1 0
108	4 0					9	†4 0	5
109	8 0	2 0				1 0	4 0	
110	7 0	4 0					1 0	
111	7 0	3 0					1	
112			5 0			6	8	
113		3 0	2 0			2 0	4 4	
114	7 0	4 0					2	
115	7 0					3 0		
116	6 0	4 0			1½		3 0	
117	4 0	5 0	3				3	
118	5 0	2 0				3 0	6	
119			4 0	9½	3 0			
120	6 0	2 0					3	
121	5 0	4 0					½	
122	6 0	1 8				6		
123	6 0	1 2			3	1 0	5	
124	12 0	4 0					3	
125	10 0	1 0		1 0			7	
126	6 0	4 0			4		(‡)	2
127		3 0	3 0				5	
128	3 6			4 0	3		5	

*Ten days. †At intervals. ‡Six months in each.

It appears from this list that a very large number of candidates have taught school. In one class there were 27 cadets who had been school teachers. It is open to discussion whether the methods at present pursued in the preliminary examination of the candidates for admission is always calculated to obtain for the institution that strong natural ability which may be found in those applying for admission, and perhaps rejected for lack of previous acquirement. What a youth may have been taught is one thing. What he is capable of being taught is another; and this cannot always be ascertained by a series of categorical questions and answers. The natural aptitude shown by the candidate should be a prominent element considered in his examination, and this can only be ascertained by the board of examiners having him before them in person instead of judging him entirely by his written answers to set questions.

In looking back upon the history of the Academy from the time of its foundation to the present period, it is found that, notwithstanding the



CADETS AT CAVALRY DRILL.

purely technical education that is acquired here for a special purpose, the graduates of the Academy are to be found in every walk and calling of life. The total number to date is 3,173.

Serving, as a rule, in the Army a sufficient length of time to return to the Government all that it demands for the education received, very many of them have sought and found those positions in civil life which their training and education qualified them to fill, until nearly every grade of industry has ranked them among its numbers. Many have been distinguished in high public positions, as governors of States, Senators and Representatives in the National Legislature, bishops, priests, judges, engineers, lawyers, physicians, professors in colleges, presidents of universities, and diplomatists, not omitting the highest office in the land—a President of the United States. The following list, taken from Cullum's Register, exhibits these facts in detail:

Civil occupations of graduates of the United States Military Academy.

Occupation.	Number.	Occupation.	Number.
President of the United States	1	Professors and teachers	119
Members of the Cabinet of the United States	4	Superintendent of Coast Survey	1
Ministers from the United States to foreign courts	7	Surveyors-general of States and Territories	6
Chargé d'affaires from the United States to foreign courts	2	Chief engineers of States	14
United States consuls-general and consuls	7	Presidents of railroads and other corporations	58
Members of the United States Senate and House of Representatives	16	Chief engineers of railroads and other public works	56
United States civil officers of various kinds	99	Superintendents of railroads and other public works	59
Presidential electors	6	Treasurers of railroads and other corporations	12
Governors of States and Territories	8	Civil engineers	187
Lieutenant-governors of States	2	Judges	12
Members of State legislature	72	Attorneys and counsellors-at-law	1
Presiding officers of States' senate and house of representatives	8	Bishops	1
Members of conventions to form State constitutions	13	Clergymen	18
State officers of various grades	51	Physicians	12
Adjutant and quartermasters general of States and Territories	14	Merchants	101
Officers of State militia	129	Manufacturers	46
Mayors of cities	10	Artists	3
City officers	34	Architects	7
Presidents of universities, colleges, &c	35	Farmers and planters	202
Principals of academies and schools	27	Bankers	16
Regents and chancellors of educational institutions	11	Bank presidents	7
		Bank officers	21
		Editors	25
		Authors	91

The remarkable fact is here presented that the Academy has contributed to the educational force of the country no less than 35 presidents of universities or colleges, 27 principals of academies and schools, 11 regents and chancellors of educational institutions, and 119 professors and teachers, making a total of 192 instructors of youth distributed throughout the country; showing that by an apparent method of natural selection the institution may be regarded in one sense as a national normal school, giving to the people at large all the benefits of its higher education and superior training.

All those graduates who have returned to civil life have shown a readiness, whatever their occupation, to respond with patriotic zeal to

the call of their country in time of need, willingly forsaking lives of comparative ease to endure again the hardships of the military service. In this manner the Academy has scattered broadcast its remarkable system of education and its superb training, giving to the country the services of its graduates, no less valuable, perhaps, in time of peace than they are in time of war.

The Board of Visitors, finding much to approve and little to criticise in the present administration of the Academy, commend the institution to the continued fostering care of Congress, believing that its expense is small compared with its results, and that the country receives back many times its cost in the valuable services of a body of men distinguished for intellectual ability, strong conservatism, a keen sense of honor, and an unimpeachable personal integrity.

All of which is respectfully submitted.

KEMP P. BATTLE.
WILSON S. BISSEL.
WILLIAM H. BLAIR.
GEORGE P. COSBY.
W. G. SUMNER.
FRANCIS T. NICHOLS.
THOMAS C. McCORVEY.
CHARLES F. MANDERSON.
RANDALL L. GIBSON.
JAMES LAIRD.
EGBERT L. VIELE.

DECEMBER 22, 1886.

I concur in all the suggestions and recommendations contained in this report, except that giving an increased number of appointments.

EDWARD S. BRAGG.

APPENDIX A.

Inspection of the accounts of Capt. William F. Spurgin, Twenty-first Infantry, treasurer United States Military Academy, May 29, 1886.

I.—*Assistant treasurer.*

Mar. 25, 1886.	Balance to debit	$40,128 06
	Deposited (through paymaster)	24,333 00
		64,461 06
	Amount credited (checks drawn)	18,720 89
	May 29. Balance to debit	45,740 17

II.—*Balances paid.*

Mar. 25, 1886.	Balance to debit	50 98
	Amount received	183 93
		132 95
	Amount disbursed	161 49
	Balance to debit	28 54

III.—*Barber and shoeblack.*

	Amount received	481 95
		481 95
	Amount disbursed	478 75
	Balance to credit	3 20

IV.—*Cadet laundry.*

Mar. 25, 1886.	Balance to credit	3,817 68
	Amount received	1,325 32
		5,103 00
	Amount disbursed	1,163 44
	Balance to credit	3,979 56

V.—*Cadet quartermaster's department.*

Mar. 25, 1886.	Balance to credit	7,623 32
	Amount received	6,686 60
		14,309 92
	Amount disbursed	9,270 93
	Balance to credit	5,038 99

VI.—*Cadet subsistence department.*

Mar. 25, 1886.	Balance to credit	$2,372 44
	Amount received	9,603 81
		11,976 25
	Amount disbursed	9,998 32
	Balance to credit	1,977 93

VII.—*Cadet cash.*

	Amount received	288 00
		288 00
	Amount disbursed	288 00

VIII.—*Confectioner.*

	Amount received	68 50
		68 50
	Amount disbursed	68 50

IX.—*Corps of cadets.*

Mar. 25, 1886.	Balance to credit	15,423 38
	Amount received	25,160 25
		40,583 63
	Amount disbursed	20,568 78
	Balance to credit	20,014 85

XII.—*Dentist.*

	Amount received	135 00
		135 00
	Amount disbursed	135 00

XIII.—*Deposits.*

Mar. 25, 1886.	Amount received	1,187 25
		1,187 25
	Amount disbursed	725 25
	Balance to credit	462 00

XIV.—*Dialectic society.*

Mar. 25, 1886.	Balance to credit	11 25
		11 25
	Balance to credit	11 25

XV.—*Equipment fund.*

Mar. 25, 1886.	Balance to credit	29,788 00
	Amount received	2,050 00
		31,838 00
	Balance to credit	31,838 00

XVI.—*Expressage.*

Mar. 25, 1886.	Amount received	$1 45
		1 45
	Amount disbursed	1 70
	Balance to debit	25

XVII.—*Gas fund.*

Mar. 25, 1886.	Balance to credit	565 66
	Amount received	664 45
		1,230 11
	Amount disbursed	468 90
	Balance to credit	761 21

XVIII.—*Hops and germans.*

	Amount received	224 00
		224 00
	Amount disbursed	40
	Balance to credit	223 60

XIX.—*Miscellaneous fund.*

Mar. 25, 1886.	Balance to credit	1,012 71
	Amount received	95
		1,013 66
	Amount disbursed	7 61
	Balance to credit	1,006 05

XX.—*Miscellaneous items.*

Mar. 25, 1886.	Balance to credit	450 30
	Amount received	444 65
		894 95
	Amount disbursed	442 90
	Balance to credit	452 05

XXII.—*Observatory fund.*

Mar. 25, 1886.	Balance to credit	404 49
	Amount disbursed	114 10
	Balance to credit	290 39

XXIII.—*Paymaster.*

	Amount charged to paymaster	24,333 00
	Amount received from paymaster	24,333 00

XXIV.—*Periodicals.*

	Amount received	26 00
	Amount disbursed	26 00

XXV.—*Photographs.*

	Amount received	20 35
	Balance to credit	20 35

XXVI.—*Policing barracks.*

Mar. 25, 1886.	Amount received	$523 95
	Amount disbursed	523 95

XXVII.—*Postage.*

Amount received	74
Amount disbursed	74

XXVIII.—*Post fund.*

Balance to credit		1,108 48
Amount received		603 52
		1,712 00
Amount disbursed		452 61
Balance to credit		1,259 39

XXIX.—*Trust funds.*

Amount on hand	20,000 00

XXX.—*Cash.*

Cash on hand	1,569 86

RECAPITULATION.

Dr.		Cr.	
Assistant treasurer	$45,740 17	Barber and shoeblack	$3 20
Balances paid	28 54	Cadet laundry	3,979 56
Expressage	25	Cadet quartermaster department	5,038 99
Trust funds	20,000 00	Cadet subsistence department	1,977 93
Cash	1,569 86	Corps of cadets	20,014 85
		Deposits	462 00
		Dialectic Society	11 25
		Equipment fund	31,838 00
		Gas fund	761 21
		Hops and germans	223 60
		Miscellaneous fund	1,006 05
		Miscellaneous items	452 05
		Observatory fund	290 39
		Photographs	20 35
		Post fund	1,259 39
Total	67,338 82	Total	67,338 82

I have seen the trust funds, counted the cash, examined the vouchers and statement of the assistant treasurer, New York, and list of outstanding checks. I find the above statement to be the condition of the funds, on hand, in trust, and with the assistant treasurer, May 29, 1886.

J. A. AUGUR,
Captain, Fifth Cavalry, Inspector.

A true copy.

W. C. BROWN,
First Lieutenant, First Cavalry,
Adjutant Military Academy.

APPENDIX B.

Report of Committee of the Board of Visitors to the United States Military Academy at West Point, charged with investigation and report concerning public buildings and grounds.

After the organization of the Board of Visitors to the United States Military Academy, on June 3, 1886, among other committees appointed was one of three members "on buildings, grounds, and other concerns of the Military Academy not provided for in the other committees."

Mr. Manderson, Mr. Cosby, and Mr. Bissell were appointed by the president of the Board to act as such committee.

A communication was thereupon addressed to the Superintendent of the Academy, of which the following is a copy:

ROOMS OF THE BOARD OF VISITORS, WEST POINT, N. Y.,
June 4, 1886.

General WESLEY MERRITT,
Superintendent West Point Military Academy:

MY DEAR GENERAL: One of the committees of the Board of Visitors is "on buildings, grounds, and other concerns of the Military Academy not provided for in the other committees," and is composed of General Cosby, Mr. Bissell, and myself. I should be much pleased if you would furnish me, at your earliest convenience, with such detailed information as may aid the committee in its investigation.

It would like a statement and general description of the buildings of the Academy, showing the purposes for which they are used, and what changes or improvements are by you deemed advisable. Also, a statement of what improvements are required to better the grounds of the military reservation.

The committee would be pleased to accompany you, or some officer designated by you for the purpose, through the public buildings and about the grounds at any time after the receipt of the information herein requested that may suit your convenience.

Very respectfully, yours,

CHAS. F. MANDERSON,
Chairman Committee on Buildings and Grounds, &c.

In response to this letter, the following was received from General Wesley Merritt, superintendent:

OFFICE OF THE SUPERINTENDENT UNITED STATES MILITARY ACADEMY,
West Point, N. Y., June 5, 1886.

Hon. CHARLES F. MANDERSON,
Chairman of Committee on Buildings and Grounds of the Board of Visitors to the United States Military Academy:

MY DEAR MR. SENATOR: In accordance with your request I inclose a list of the public buildings at this post and a statement of the uses to which they are put:

1. Cadet hospital.
2. Cadet mess-hall.
3. Academic building and gymnasium.
4. Cadet barracks.
5. Commandant's office, cadet guard, and fire-engine house.
6. Steam-heating plant.
7. Cadet water-closets.
8. Coal-house.

9. Storehouse and workshops of cadet quartermaster.
10. Riding hall.
11. Stable for cavalry and artillery horses.
12. Executive building.
13. Chapel.
14. Library.
15. Ordnance laboratory.
16. Gas and gas-coal-house.
17. Shops and sheds (4) quartermaster's department.
18. Store-house, quartermaster's department.
19. Granary.
20. Stable, Quartermaster's Department.
21. Barracks cavalry detachment.
22. Barracks artillery detachment.
23. Chapel for enlisted men and their families.
24. Coal-house for quartermaster's department.
25. Band barracks.
26. Hospital for enlisted men.
27. Barracks engineer company.
28. Equipment and commissary store-houses.
29. Cadet laundry.
30. School-house for enlisted men and children.
31. Observatory.

QUARTERS.

Thirty-three sets quarters, occupied by thirty-seven professors and officers.
Six sets quarters in old cadet hospital, occupied by nine officers.
Twelve officers occupy quarters in cadet mess-hall building, cadet and engineer company barracks.

MISCELLANEOUS BUILDINGS.

1. Confectionery and market shop.
2. Stable public carrier.
3. Quarters occupied by Messrs. Butler, McEnamy, & Erwin.
4. Cottage occupied by Mr. Koehler.

5. Quarters occupied by Mr. Wood and Mr. Denton.

In these the following changes are by me deemed desirable and necessary, and are named in the order of their importance:

1. Work-shops for the quartermaser's department, to be erected at a cost of $11,500.
2. Gymnasium for instruction of cadets, $30,000.
3. Changes in present academic building, to include raising it one story, making it fire-proof, and converting basement for use of department of instruction, $75,000.
4. Changes in library building for an increased accommodation of books, $5,000.

The above includes the pressing needs of the Academy, to which should be added sixteen sets of quarters for enlisted men connected with the Academy, to cost not to exceed $14,000.

There are no necessities connected with the improvement of the public grounds of the reservation which cannot be met by the usual yearly appropriations made by Congress and by the labor of the troops.

I will be glad to accompany your committee on an inspection, with a view to the correct understanding of the above and kindred matters, on Monday, June 7, at 10 a. m., or on any other day at such hour as may be convenient to your committee.

Very respectfully, your obedient servant,

W. MERRITT,
Colonel Fifth Cavalry, Brevet Major-General, U. S. A., Superintendent.

The committee were afforded every facility for thorough examination of the buildings described above, and also carefully investigated as to the care and condition of the public land, the means afforded to supply water, heat, and light, the sewerage, and the maintenance and repair of roads.

The reservation contains about 2,200 acres of land. Its beautiful situation, diversified surface, adaptability for perfect drainage, convenience of approach are all admirably supplemented by the intelligent administration that has advantaged itself of every opportunity.

The most rigid and scrupulous care is and has been exercised over the grounds and buildings. The roads and paths are located to join convenience to beauty, and are in admirable repair. The surface drainage and underground sewerage are excellent in design and well guarded in the interest of health and cleanliness. The committee, on July 7, 1886, addressed a letter to the Superintendent, of which the following is a copy:

WASHINGTON, D. C., *July* 7, 1886.

General WESLEY MERRITT, U. S. A.,
West Point, N. Y.:

MY DEAR GENERAL: My attention has been called to the following statement, contained in a "Directory of the Gas-Light Companies of the United States," 1886:

"652. West Point Gas-Works (belongs to United States Government; superintendent, J. E. Richards): Price of gas per 1,000 feet, 75 cents; number public gas-lamps, 27; approximate annual output, 11,000,000 feet; process of manufacture, coal."

This statement has provoked some comment in the investigation of the supply of gas, cost, &c., at Washington.

I deem it well, in the interest of the Military Academy, that in the report of the Board of Visitors there should be full showing as to the supply of both gas and water. Will you at your convenience cause this to be mailed to me?

As to gas, it should show length and character of mains and pipes; kind and capacity of works; power of gas and amount supplied; amount of coal and other material consumed and its cost; cost of care of works and distribution; estimated cost of the gas supplied; number of lamps, buildings supplied, &c.; how work is directed; what improvements are needed in interest of good service and economy, &c.

Very truly, yours,

CHARLES F. MANDERSON.

To this the following answer was obtained:

OFFICE OF THE SUPERINTENDENT U. S. MILITARY ACADEMY,
West Point, N. Y., July 19, 1886.

Senator CHARLES F. MANDERSON,
Washington, D. C.:

MY DEAR SENATOR: A temporary absence from West Point has delayed the answer to your favor of the 7th instant.

I inclose memoranda as to gas and water supply at West Point.

There has never been, to my knowledge, any charge for water to officers.

The charge for gas has varied according to the state of the fund, and approximately with the cost of manufacture, though, as stated in the memorandum, there are no appliances for determining its exact cost from year to year.

There is no authority for the publication you extract from, a "Directory of the Gas-Light Companies of the United States" for 1886.

Hoping that the information inclosed covers generally the ground of your inquiry, I am, very truly yours,

W. MERRITT,
Colonel Fifth Cavalry, Brevet Major-General U. S. Army, Superintendent.

MEMORANDA.

GAS-WORKS.

	Feet.
Six-inch cast-iron pipe, main	1,981
Four-inch cast iron-pipe, main	3,826
Three-inch cast-iron pipe, main	1,680

Kind of works: Coal-gas.

Capacity of works: 20,000 cubic feet of gas per day.

Pressure: 2.5 inches.

Illuminating power: About 17 candles.

Amount supplied: No appliances for determining the amount supplied.

Amount of coal used during the fiscal year ending June 30, 1886: 854 tons of Westmoreland gas coal, at a cost of $4.10 per ton of 2,240 pounds; 48 tons of Cannelton coal, at $11 per ton of 2,240 pounds.

Mode of purifying: Glens Falls Joint a lime.

Amount of lime used: 168 barrels, at $1.12½ per barrel.
Number of street lamps: 48, which includes lamps in camp, which are used only during the summer encampment.
The improvements required for good service and economy: A new gas-holder, of same capacity as present one, and a station-meter. In fact, the present works are strained to their utmost capacity, and should any accident happen to the only holder we would be without gas until repairs could be made.

WATER-WORKS.

Four miles 112 yards, 6 inch cast-iron supply pipe from Round Pond to Delafield receiver; 3,498 feet 6-inch cast-iron supply pipe from Sinclair Pond to water-house; 858 feet 4-inch cast-iron supply pipe from Crow Nest Pond to intersection of Sinclair Pond line.

	Feet.
12-inch cast-iron water main	3,559
7-inch cast-iron water main	2,325
4-inch cast-iron water main	3,113

Respectfully submitted.

C. H. ROCKWELL,
Captain, Fifth Cavalry, Quartermaster Military Academy.

The ADJUTANT, UNITED STATES MILITARY ACADEMY.

The facilities for the supply of water for domestic and sanitary use, for ornamental purposes, and as a fire protection are believed to be ample. Valuable suggestions made by former Boards of Visitors, notably that of 1884, as to water supply and for bettering of drainage and sewerage, have been adopted. The facilities for bathing are good, and the regulations for cleanliness, both of quarters and person, are such as can only flow from abundance of good water. In the event that the gymnasium (hereinafter recommended) to be erected should be built, additional baths as an important incident thereto will be needed.

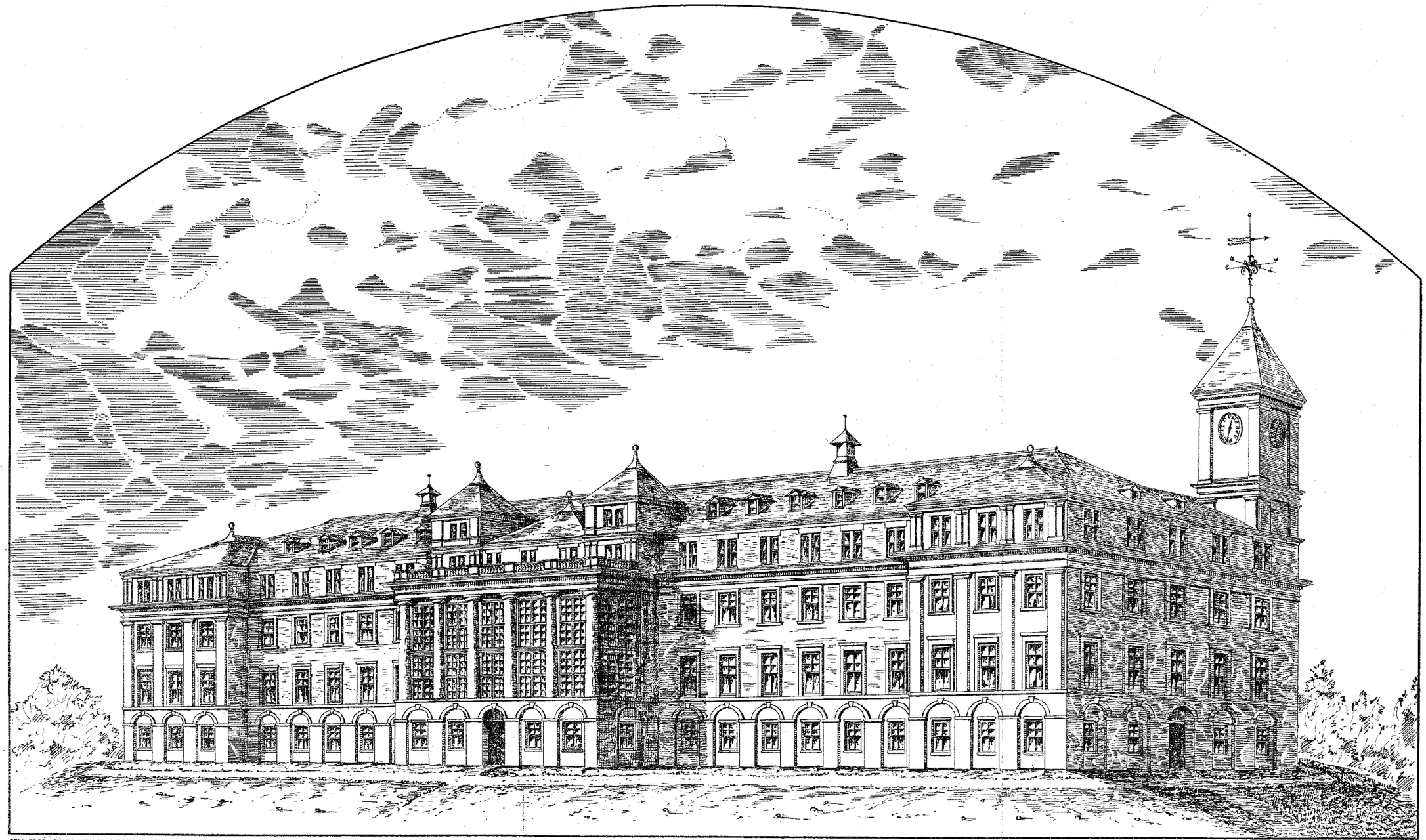
In the interest of public decency, and to prevent defilement of the grounds, latrines with copious flow of water should be erected for public use.

The Military Academy, a model in many respects, can well afford to set the example to American communities of those conveniences for public use naturally required where people congregate, and the absence of which in our cities is a fertile source of much disease and impurity.

The gas-works, as will be seen by the above report of Captain Rockwell, quartermaster, "are strained to the utmost capacity." They should be enlarged, and your committee suggest that the electric light, in the interest of better illumination and greater economy, could be well introduced. The power to create it could also be used for other important purposes, among them, to give the motive power to the repair shops, the reconstruction and rearrangement of which is hereinafter advised.

While most of the buildings of the Military Academy are ample and well adapted for their uses, there are some that are unfitted in many respects; and to enable this admirable military school to keep pace with the times and abreast with other educational institutions of the country, considerable expenditure is absolutely necessary. Many of the changes herein recommended have been advised by former Boards, and it is matter of sincere regret to your committee that their admirable suggestions in this regard have not been adopted.

The main question for the decision of the committee and the Board of Visitors was the disposition which should be made of the academic building. Its modification or change so that it would be properly adapted to all the requirements of instruction would be extremely ex-



BELL BROS., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

H Ex 52 49 2

VIEW OF ACADEMIC BUILDING U.S.M.A. WEST POINT.

SHOWING PROPOSED ADDITION ABOVE PRINCIPAL CORNICE.

STEPHEN D. HATCH.
ARCHITECT.

pensive, and the structure when so changed would be illy fitted, by reason of its defective light and location to the needs of some of the departments, notably that of chemistry.

The erection of a new edifice and the modernizing of the present building would also be very expensive, but the result obtained would be commensurate with the expenditure and place the Academy where it should be in comparison with other schools. Recognizing the importance of the questions involved, the commtttee, at the suggestion of the Board of Visitors, requested General Merritt to obtain and report the views of the Academic Board. In compliance therewith the following letter and report are submitted:

OFFICE OF THE SUPERINTENDENT,
UNITED STATES MILITARY ACADEMY,
West Point, N. Y., June 23, 1886.

Senator CHARLES F. MANDERSON, *Washington, D. C.:*

SIR: In complianace with the request of the Board of Visitors, contained in letter of 12th instant, I have the honor to inclose herewith a copy of report setting forth the views of the Academic Board, as a body, upon the necessity for the erection of additional buildings at the Academy, as well as the desirability of a change in the academic building.

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

W. MERRITT,
Colonel Fifth Cavalry, Bvt. Maj. Gen., U. S. A., Superintendent.

The Academic Board are of the decided opinion that increased facilities for instruction are now absolutely essential to the best interests of the Academy. For the accomplishment of this end in a permanent and economical manner, they recommend—

(1) The erection of a suitable gymnasium in a separate building.

(2) The erection of a separate building to accommodate the departments of chemistry and philosophy.

(3) The modification and renovation of the present academic building to meet, as nearly as posible, the requirements of the other departments of instruction, viz, mathematics, engineering, modern languages, drawing, history, ordnance and gunnery, law and tactics.

The reasons for such opinion are, briefly—

(1) The present gymnasium is poorly adapted for its purposes, entirely preventing certain physical instruction which it is desired to give. It is badly lighted and ventilated, and is too small. Due to its location, the noises necessarily attending certain exercises therein seriously interfere with the instruction in the academic departments.

These defects would not exist in a new gymnasium, and, in addition, it would furnish a much needed hall for the socia lentertainments of the cadets, for any military exercise deemed desirable in winter, and for graduating exercises in summer.

(2) The department of chemistry is not now prepared with facilities for the best instruction in the subjects embraced (chemistry, electrics, mineralogy, and geology). A properly fitted building for this purpose must be of special construction to a certain extent. The requirements for the best instruction in this department cannot be met by any modification of the present academic building; besides, any such attempt would deprive other departments of much-needed space.

The department of philosophy occupies space which is needed for library purposes, and must, at no distant day, seek other quarters.

Certain of the subjects embraced in the departments of philosophy and chemistry are so related that some advantages would result from having the departments in the same building, and there would be no disadvantage to such arrangement.

(3) Some of the other departments of instruction are in great need of space. In addition to the section-rooms, which are necessary to all and which are at present small and badly ventilated, there are urgently needed by the mathematical department two examination halls, a lecture-room, and a model-room.

For the engineering department, a lecture-room, a drawing-hall, and a room for models and appliances.

For the department of history, a lecture-room and special section-rooms for maps and diagrams.

For the ordnance department, additional room for the museum and models.

Rooms for court-martial and for meetings of the Academic Board are also very desirable.

It is believed that these much-needed facilities can be obtained by a judicious modification of the present academic building, if the department of chemistry is provided for elsewhere. The necessity for making the present academic building less liable to destruction by fire is of itself a powerful reason for modifying it.

E. W. BASS,
Professor of Mathematics.
S. E. TILLMAN,
Professor of Chemistry, &c.
W. C. BROWN,
First Lieutenant, First Cavalry, Secretary Academic Board.

WEST POINT, N. Y., *June* 21, 1886.

The above set forth views are most cordially concurred in. At an expense of less than $300,000 the buildings necessary for the Military Academy for all future foreseen necessities could be erected and the modifications above referred to be made.

W. MERRITT,
Bvt. Maj. Gen., U. S. A., Colonel Fifth Cavalry, Superintendent.

The committee substantially agrees with the academic board upon the advisability of these changes and recapitulates them as follows:

(1) The erection of a building for the purposes of a gymnasium, with suitable accommodations for drill in arms during inclement weather and in the winter season. It should contain suitable apparatus, implements, and appliances for the physical training of the cadets. Those of the Board of Visitors who were familiar with the Academy in earlier days were greatly impressed with the importance of the gymnastic exercises of the school, so much in advance of that which formerly obtained, and greatly favor the continuance, enlarging, and bettering of such instruction. A building well adapted to such purposes can be erected at a probable expense of $25,000. The present gymnasium is in the basement of the academic building, which is poorly lighted and ventilated. Former Boards of Visitors have complained of it.

In 1881 it was said:

> The deficiencies of the gymnasium in all respects are deplorable.

In 1883:

> There is but one opinion on the part of the Board as to the importance of continuing gymnastic instructions, and of making it more efficient by providing adequate accommodations for its development. The room now used for that purpose in the academic building falls far short of the requirements of a modern gymnasium, and is utterly unsuited to the purposes to which it is applied.

In 1884 the Board advised the erection of a new gymnasium, with baths under the same roof.

In 1885 the Board said:

> The present gymnasium is unfit for the purpose, and a new one should be erected.

Certainly this much-recommended improvement should be no longer neglected.

(2) The erection of a separate building to accommodate the department of chemistry and philosophy. The modern instructions in chemistry, electrics, mineralogy, geology, &c., require special adaptation in a building as regards light, heat, and sound. These requirements cannot be obtained by any modification of the present academic building. The subjects are of the highest importance in modern science and the present art of war. The colleges and technical schools of the country are fully alive to them, but the United States Military Academy seems to be sadly behind the times, simply because it lacks the proper me-

chanical appliances for the best instruction. It is believed that the building could be erected for not to exceed $75,000.

(3) The present academic building should be renovated and modified for the very abundant reasons urged in the report of the academic board. The building now is in great need of repair, and is simply a fire-trap, endangering the surrounding structures. It was built many years ago, and has such great defects that it has been condemned by every Board of Visitors for many years. It should be raised one story, and be made fireproof, so far as a reasonable expenditure can make it so. The estimate for its modification is $75,000, but by the construction of a small separate academic building for the schools of chemistry and philosophy, and a separate gymnasium, it is quite probable that $50,000 would be sufficient for the purpose.

(4) Workshops for the quartermaster's department should be erected, at a cost of about $12,000.

These shops are a necessity, and save the Government an immense outlay for repairs of quarters, vehicles, camp material, &c. They now consist of a number of unsightly frame structures, in a tumble-down condition, giving also much fear of disastrous fires from their inflammable and exposed condition.

They should be consolidated under one roof and arranged for the introduction of power. The committee cordially indorse the recommendation of General Merritt, and quote approvingly the suggestions of former Boards of Visitors, as follows:

From the report of 1883 we quote:

> There are several old and dilapidated wooden buildings, located near the artillery and cavalry barracks, and used for workshops and storehouses. They are in the last stages of decay and crowded closely together, and are wholly unsuited to the uses to which they are put. Should a fire break out among them (an event very likely to happen), it would cause the loss of much valuable property stored in them and greatly endanger the safety of neighboring buildings. We recommend their removal and the erection of a suitable building or buildings of substantial materials in their place.

In 1884 the Board said:

> There is a considerable district lying under the hill towards the north containing a large number of shabby and very old buildings. Some of these are used for shops and other public purposes, while others serve as quarters for the married enlisted men at the post. * * * They are certainly entirely inappropriate to a well-kept Government institution like this. We recommend that these buildings be replaced by suitable substantial brick or stone quarters, and we recommend a similar substitution of proper structures for all of the tumble-down shops and sheds above referred to. The existing condition has a most unsatisfactory and poverty-stricken look, and is without justification even on the score of economy.

The Board of Visitors in 1885 reported:

> The blacksmith and other shops are now in such dilapidated condition as to be almost unfit for use. The quarters for the families of the enlisted men are very indifferent and new ones are very much needed.

(5) Sixteen sets of quarters for enlisted men connected with the Academy, to cost, say, $15,000.

These are much needed, the present wooden buildings being almost uninhabitable and falling to pieces from decay. This improvement has been frequently urged upon the consideration of Congress.

While there are some other and much-needed repairs and improvements, notably some buildings of modest cost that would better accommodate the Board of Visitors than the present much-crowded and inconvenient hotel, and additional room in the public library to accom-

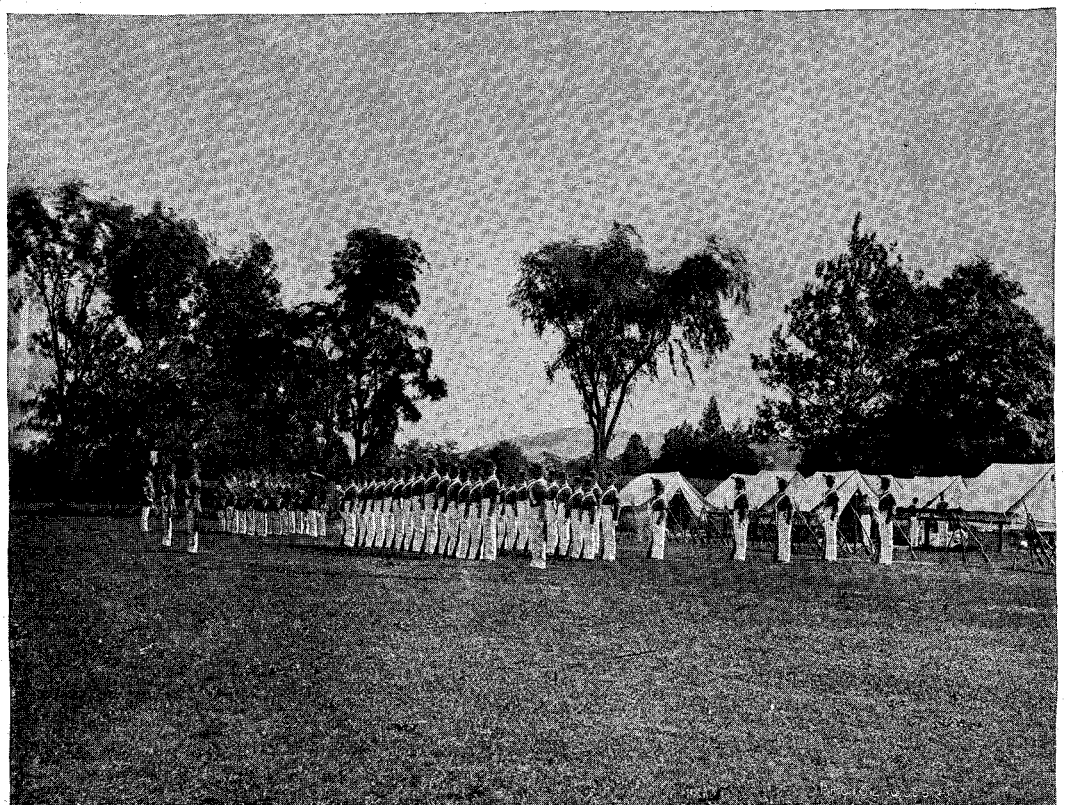
modate the increasing number of books, the committee recommend only the improvements above suggested and here briefly repeated:

(1) Gymnasium, to cost	$25,000
(2) Academy for department of chemistry and philosophy	75,000
(3) Repair of present academic building	75,000
(4) Workshops	12,000
(5) Quarters for enlisted men	15,000
Total	202,000

Your committee believe that by the judicious expenditure of $200,000 all these pressing wants could be well supplied, and, in the language of the efficient Superintendent, "the buildings necessary for the Military Academy for all future foreseen necessities" be supplied.

The committee feel it to be their duty, as it is their pleasure, to call attention to the excellent conduct and arrangement of the hospital and mess-hall. Both are evidently in efficient and experienced hands. General Merritt, Superintendent, afforded the committee every possible opportunity for investigation.

CHARLES F. MANDERSON.
WILSON S. BISSELL.
GEORGE P. COSBY.



GUARD-MOUNTING IN CAMP.

APPENDIX C.

EXAMINATION PAPERS FOR CANDIDATES FOR ADMISSION.

JUNE, 1886.

EXAMINATION IN ARITHMETIC.

1. What decimal fraction, multiplied by 175, will be equal to the sum of $\frac{1}{4}$, $\frac{16}{25}$, $\frac{42}{50}$, and $3\frac{1}{2}$?

2. How many miles will a ploughman walk in ploughing an acre if each furrow is one foot in width?

3. If $29\frac{14.7}{8765} \times \frac{7252}{00004}$ be subtracted from each of the two numbers, $475\frac{17}{19}$ and 2.10009, will the ratio of the two remainders, taken in order, be the same as that of the two numbers? Why?

4. On a Centigrade thermometer the freezing point is zero, and the boiling point is 100°. On a Fahrenheit thermometer the freezing point is 32°, and the boiling point is 212°. What degree on a Centigrade corresponds to 68° Fahrenheit?

5. How many pounds of tea are equivalent to $10\frac{1}{2}$ pounds of butter, when 5 pounds of tea are equivalent to 14 pounds of coffee; 9 of coffee to 20 of sugar; 10 of sugar to 6 of cheese, and 10 of cheese to 9 of butter?

6. If $44\frac{1}{2}$ guineas weigh 1 pound Troy, and 32 half-pennies weigh 1 pound avoirdupois, what is the difference, in grains, between the weights of a guinea and a half-penny?

7. $21,000 is to be divided among A, B, C, and D. A's share is to B's as 2:3, B's to C's as 4:5, C's to D's as 6:7. What will each receive?

8. If 30 men working 11 hours a day can do a piece of work in a certain time, how many more men must be employed when it is half done in order to finish it in the same time, all working 10 hours a day on the last half?

9. The value of a pound of gold is 14 times that of a pound of silver, and the weights of bars of equal size of gold and silver are as 19:10. Find the value of a bar of silver equal in size to a bar of gold worth £1,750.

JUNE 16, 1886.

EXAMINATION IN WRITING AND ORTHOGRAPHY.

It was not only by the efficiency of the restraints imposed on the royal prerogative that England was advantageously distinguished from most of the neighboring countries. A peculiarity equally important, though less noticed, was the relation in which the nobility stood here to the commonalty. There was a strong hereditary aristocracy; but it was, of all hereditary aristocracies, the least insolent and exclusive. It had none of the invidious characters of a caste. It was constantly receiving members from the people, and constantly sending down members to mingle with the people. Any gentleman might become a peer. A younger son of a peer was but a gentleman. Grandsons of peers yielded precedence to newly-made knights. The dignity of knighthood was not beyond the reach of any man who could by diligence and thrift realize a good estate, or who could attract notice by his valor in a battle or a siege. It was regarded as no disparagement for the daughter of a duke, nay of a royal duke, to espouse a distinguished commoner.

His was the pomp, the crowded hall,
  But where is now his proud display?
His riches, honors, pleasures,—all
  Desire could frame; but where are they?
And he, as some tall rock that stands,
  Protected by the circling sea,
Surrounded by admiring bands,
  Seemed proudly strong—and where is he?

1. Agility.
2. Annular.
3. Antecedent.
4. Artillery.
5. Ascend.
6. Barbarism.
7. Barricade.
8. Bigotry.
9. Bounteous.
10. College.
11. Communicate.
12. Coherence.
13. Collide.
14. Coliseum.
15. Dalliance.
16. Debarred.
17. Deceive.
18. Exhibit.
19. Exonerate.
20. Fascinate.
21. Irritate.
22. Grammar.
23. Menace.
24. Parallel.

Official copy:

W. C. BROWN,
First Lieutenant, First Cavalry, Adjutan

HEADQUARTERS UNITED STATES MILITARY ACADEMY,
West Point, N. Y., June 26, 1886.

JUNE, 1886.

EXAMINATION IN HISTORY.

Time allotted, three hours.

[Write as legibly and concisely as possible, without omitting material facts.]

1. Name the first discoverer of America from each of the following countries, and give the date of each discovery:
   (1) England.
   (2) Spain.
   (3) France.
2. Write after each of the following named colonies the date and locality of the first settlement, and state to what nation the settlers belonged:
   (1) Georgia.
   (2) Maryland.
   (3) Pennsylvania.
   (4) Virginia.
3. When, and as the result of what war, were the French possessions in Canada transferred to England?
4. What were the boundaries of the territories of the United States after the close of the Revolutionary war?
   North.
   South.
   East.
   West.
5. When and where did each of the following events occur?
   (1) The first colonial Congress.
   (2) Burgoyne's surrender.
   (3) Arnold's treason.
6. Name two defects in the articles of Confederation which made it necessary to form a new Constitution for the United States.
7. Where and when was the first Government organized under the present Constitution?
8. Under whose administration did each of the following events occur?
   (1) The Louisiana purchase.
   (2) The nullification act.
   (3) The Missouri compromise.
   (4) The Gadsden purchase.
9. When and from whom was the territory acquired which is comprised in each of the following-named States?
   (1) Texas.
   (2) California.
   (3) Florida.
   (4) Arizona.

10. Name three States of the Union which have been admitted since the adoption of the Federal Constitution and which formerly belonged, wholly or in part, to other States of the Union.
11. Name the States in the Union in which slavery existed in 1861?
12. Which of the slave States passed the ordinance of secession and which remained loyal to the Government at Washington?
13. Give the names, dates, and immediate results of six important battles of the civil war?
14. What text-books in United States history have you studied?

JUNE, 1886.

EXAMINATION IN ENGLISH GRAMMAR.

Time allotted: two and one-half hours.

DIVISION I.

[N. B.—Write the answers below, numbering them to correspond with the questions.]

1. What is *declension?* Decline *child, who, he.*
2. Write the plural of *dwarf, fly, pen, ox, footman, calf, handful, cargo, chimney, potato*
3. What is a *sentence?* Name the different *kinds of sentences.* What is a *phrase?* What is a *clause?* Give examples of the *sentence,* the *phrase,* and the *clause.*
4. What is a *conjunction?* How do you *parse* a conjunction?
5. What is an *adjective?* Of what *inflection* or *change of form* do adjectives admit?

DIVISION II.

[N. B.—Write quite across both pages. if necessary. In parsing, give no rules, declensions, or principal parts; but in other respects parse fully, being careful to give the subject of each verb, the governing word of each objective case, and to state precisely what each conjunction connects, between what words each preposition shows the relation, and to what each pronoun refers. Important omissions will be taken to indicate ignorance. Intelligible abbreviations are allowed.]

Parse the words in italics in the following sentence: *In* free states *no man* should take up arms, *but with* a view *to defend* his *country* and its laws; he *puts off* the citizen *when* he enters the camp; *but it* is *because* he is a *citizen* and would continue *such* that he makes *himself for* a *while* a *soldier.*

DIVISION III.

Correct all errors in the following sentences, including bad arrangement of words

1. His work is one of the best that has been published.
2. No Roman emperor was so cruel nor so tyrannical as Nero.
3. Have you no other excuse but this?
4. We not only obtained Louisiana, but Florida also, by purchase.
5. Flour will not do to make our bread alone.
6. The number of inhabitants were not more than four millions.
7. They told me of him having failed.
8. But she fell a laughing like one out of their right mind.
9. What else could he do in the circumstances he was placed.
10. Whom do you suppose it was?
11. The board of directors looked gravely; in fact a frown began to settle on its face.
12. Why have you not kept the promise you have made when I was at your house?
13. Suppose Xerxes had have succeeded in conquering Greece!
14. If I were in his place, I would not have gone.
15. These flowers smell sweetly and look beautifully.
16. There is no charity in giving of money to the intemperate.
17. I have and ever shall insist on the necessity of economy.
18. The dahlia, as well as fuschia, is a native of America.
19. The spirit and not the letter of the law, are what we are to follow.
20. London is the largest of any city in Europe.
21. Am I the scholar who am to be punished?
22. The man could neither read or write.
23. Every one of your arguments are absurd.

JUNE, 1886.

EXAMINATION IN GEOGRAPHY.

1. What proportion of the earth's surface is land?
2. Which hemisphere contains the more land, Northern or Southern?
3. If one should start from a point on the equator in the mid-Atlantic and travel eastward entirely around the earth, keeping on the equator, name the bodies of land and water over which he would pass.
4. Name the five largest oceans of the earth.
5. Name all the States and Territories of the United States which touch the Atlantic, Pacific, or Gulf of Mexico.
6. Name the States east of the Mississippi which touch neither the Gulf of Mexico the Atlantic, nor the Great Lakes.
7. Bound the following States and Territories: Idaho, Arizona, Indian Territory Minnesota, Kentucky, North Carolina, and Vermont.
8. What States and Territories lie in part or wholly west of the Rocky Mountain system?
9. Locate definitely the following places, stating upon what waters they are situated: Montgomery, Macon, Shreveport, Little Rock, Austin, Albuquerque, Sacramento, Cheyenne, Detroit, Harrisburg, Bangor, Milwaukee.
10. If a man should start from Santa Fé and go due north to the British line, through what States and Territories would he pass?
11. The parallel of Saint Louis, between the Atlantic and Pacific, passes through what States and Territories?
12. What political divisions of South America, between its most easterly and southerly points, border on the Atlantic Ocean?
13. In going from St. Petersburg to Bombay by steamer, nearest route, over what waters and by what countries would you pass?
14. What countries of Europe touch Austria?
15. Where is Beloochistan?
16. Where is Nankin; upon what water is it situated?
17. What is the general direction of the Hiang Ho or Yellow River; where does empty?
18. Where is Cambodia; to what country does it belong?
19. Where is the Gulf of Salonica?
20. Where is the Strait of Otranto?

APPENDIX D.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, D. C., January 5, 1887.

DEAR SIR: In compliance with your oral request of day before yesterday, I have the pleasure of inclosing a statement showing the aggregate amount of gifts and legacies to twenty institutions of learning in this country between the years 1876 and 1885, both inclusive.

No special attempt was made to select these institutions on account of the amounts received by them. The most of them are colleges attended by young men only. Wellesley College, however, is a college for women. Four theological seminaries are mentioned to show how modern learning, even in that direction, requires an increase of endowment and income. Cazenovia Seminary is mentioned as a specimen of the great number of academies annually receiving gifts and legacies for the improvement of their resources as teaching centers.

In using these statistics, please remember that the sums mentioned are only a small part of the tremendous amount of money given every year to American schools and colleges of various kinds.

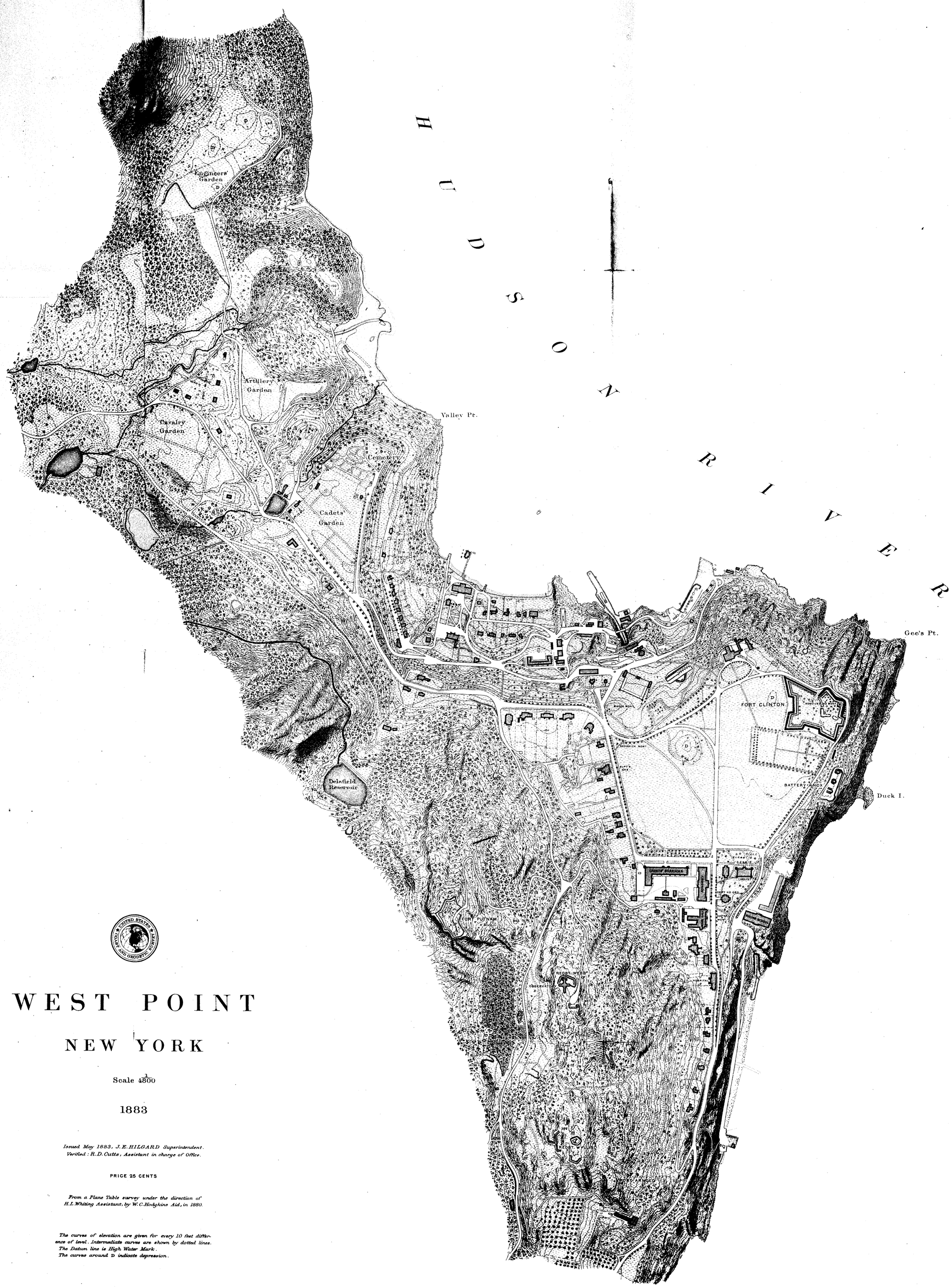
For the two years 1876–'77 this entire amount was $7,707,101; for the two years 1878–'79, $8,353,099; for 1880–'81, $12,953,725; for 1882–'83; $7,141,363; for 1884–'85, $20,584,317; and for the entire period, 1876 to 1885, both inclusive, $56,739,605.

Very respectfully,

WM. H. GARDINER,
Acting Commissioner.

General E. L. VIELE, M. C.,
House of Representatives, City.

O



WEST POINT

NEW YORK

Scale $\frac{1}{4800}$

1883

Issued May 1883, J.E. HILGARD Superintendent.
Verified: R.D. Cutts, Assistant in charge of Office.

PRICE 25 CENTS

From a Plane Table survey under the direction of H.L. Whiting Assistant, by W.C. Hodgkins Aid, in 1880.

The curves of elevation are given for every 10 feet difference of level. Intermediate curves are shown by dotted lines. The Datum line is High Water Mark. The curves around D indicate depression.

Meters
100 50 0 100 200 300 400 500

Statute Mile
0 ⅛ ¼ ⅜ ½

BELL BROS., LITHOGRAPHERS, WASHINGTON, D. C.

Engraved from the Original Sheet by H.C. Evans. Title and Lettering by E.A. Maedel.