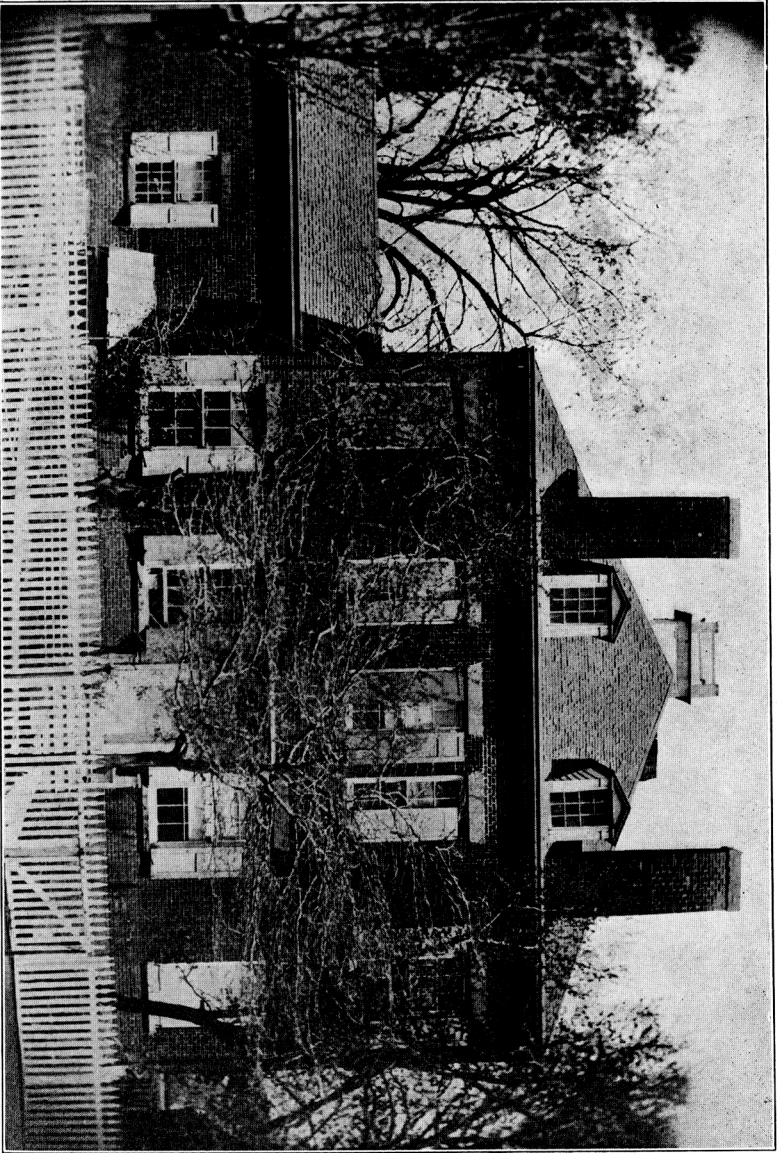


Coat of Arms, 1904



Old Bank Place. Occupied, 1824-34 and 1841-44

HISTORY  
OF  
Rensselaer Polytechnic  
Institute

1824-1934

BY  
PALMER C. RICKETTS

PRESIDENT AND DIRECTOR



*THIRD EDITION*

*New York*  
JOHN WILEY & SONS, Inc.  
LONDON: CHAPMAN & HALL, LIMITED  
1934

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BY  
PALMER C. RICKETTS

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PRESS OF  
BRAUNWORTH & CO., INC.  
BOOK MANUFACTURERS  
BROOKLYN, NEW YORK

TO THE MEMORY  
OF  
**Stephen Van Rensselaer**  
**Amos Eaton**  
AND  
**Benjamin Franklin Greene**

## PREFACE TO THE THIRD EDITION

THE first edition of this history was published about forty years ago and the second edition about twenty. In the preface to the second edition attention was called to the many changes for the better which had taken place during the preceding twenty years. The same thing may be said of the changes since 1914. The additions to our corps of instructors, number of courses given, and facilities for instruction have been marked. We now have more than twice the number of instructors, more than twice the number of students, more than twice the number of courses given, and more than twice the number of buildings. The value of our property is now more than five times its value twenty years ago.

It is satisfactory to note this progress in the last edition of this history which will appear.

RENSELAER POLYTECHNIC INSTITUTE,  
TROY, N. Y., June, 1, 1934.

## PREFACE TO THE SECOND EDITION

TWENTY years have elapsed since the appearance of the first edition of this history. Many changes have taken place in the Institute during this period. It has become a larger school; more courses of instruction are given; there are more teachers and more students, more buildings and larger ones, a far better equipment, and a larger endowment. Its field has been broadened and its standards for graduation have been raised.

In the first preface, the Institute is said to be the first school of science and the first school of civil engineering to be established in any English-speaking country. In the first chapter of this edition it is shown that this statement should be modified; that there was one school established, as the Rensselaer School was, primarily for the teaching of science, which antedated it by about two years, but which soon passed out of existence. It is, therefore, more correct to say that the Institute is the first school of science and the first school of civil engineering, which has had a continuous existence, to be established in any English-speaking country.

P. C. R.

RENSSELAER POLYTECHNIC INSTITUTE,  
TROY, N. Y., November, 1914.

## PREFACE TO THE FIRST EDITION

HAVING recently been compelled to write several brief historical sketches of the Institute, the writer became interested in its early history. In preparing these narratives he found the official publications giving the characteristics of the School at the time of its foundation to have become very rare. In fact, very few of them antedating 1840 are known to be in existence. For these reasons he determined to expand the sketches and publish a short history of the institution which should consist largely of a description of the development of its curriculums.

The student of the history of education will recognize the importance of an account of the early methods of instruction pursued in an institution which was, at once, the first school of science\* and the first school of civil engineering to be established in any English-speaking country, and if the conceded originality of these methods be also considered, it is believed that no excuse for the appearance of this somewhat condensed narrative will be thought necessary.

Interesting information has been obtained from the recently discovered original minutes of the board of trustees for the twenty-five years immedi-

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\* See Preface to the Second Edition.



ately following the founding of the School, which were believed to have been destroyed in the fire of 1862, and the thanks of the writer are due the president and secretary of the present board for placing at his disposal the minutes covering the period from 1862 until the present time.

The author is also under obligation to Professor Henry B. Nason for the loan of a number of the early circulars, to A. J. Weise, Esq., for the picture of the Van der Heyden mansion, to James Irving, Esq., for that of the building on the Infant School Lot, and to Professor William G. Raymond for the two photographs from which the pictures showing railroad and hydrographic work of students were taken. The Bibliography at the end of the last chapter shows other sources whence information has been obtained.

P. C. R.

RENSSELAER POLYTECHNIC INSTITUTE,  
TROY, N. Y., January 1, 1895.

## FOREWORD

FEW persons, even those most interested in the history of education in this country, are cognizant of the great part Rensselaer School, afterwards Rensselaer Polytechnic Institute, has taken in the development of scientific education. To break down the tradition of centuries in a system of education is no easy task. Established in 1824 at a time when there was little popular information regarding the principles of science, and not much more knowledge of this kind among the faculties of the colleges, an organization existing for the diffusion of scientific knowledge was regarded with little enthusiasm by most of those who had been educated under the classical aegis.

Stephen Van Rensselaer, able and altruistic, a man of wealth and position, was wise enough to discover the genius of Eaton and employ him to deliver a course of popular lectures on natural science, afterwards appointing him head of Rensselaer School. Amos Eaton, geologist, botanist, chemist, called the "Father of American Geology," was one of the great men of science of his time. He was the first to give systematic instruction in field work in any school and, before Liebig and Lord Kelvin, was the first to establish (in 1824), in this

or any other country, laboratories for the systematic individual instruction of students in chemistry and in physics. He developed in the school the first engineering curriculum to be created in the country and the school gave the first engineering degree—that of civil engineer, in 1835.

Later when B. Franklin Greene, the then director, re-organized the course in 1849–50, the civil engineering curriculum he inaugurated formed the basis of courses of that kind in almost every engineering school afterwards established in this country. Forty years before the departments of architecture were created, in the universities of Pennsylvania, Harvard, and Columbia, he published, in his classic pamphlet entitled “The True Idea of a Polytechnic Institute,” a curriculum for an architectural course which want of funds alone prevented him from establishing at that time.

A pupil of Eaton, he fully appreciated the value of laboratory work and research so carefully instilled in the minds of his pupils by Eaton. In enunciating his ideas on this subject he wrote that in chemistry and in physics each student was furnished with all needful facilities for making his own experimental demonstrations, this being essential to success in the “business of research.” Thus these two men, before there was any other school of engineering in this country, recognized the value of research and, as far as they were able, developed a love of it in their students.

Surely this school, for its primacy in almost

everything found to be of value in methods of instruction in the scientific schools of this country today, must justly be recognized as the pioneer in schools of engineering and technology, and even of architecture.

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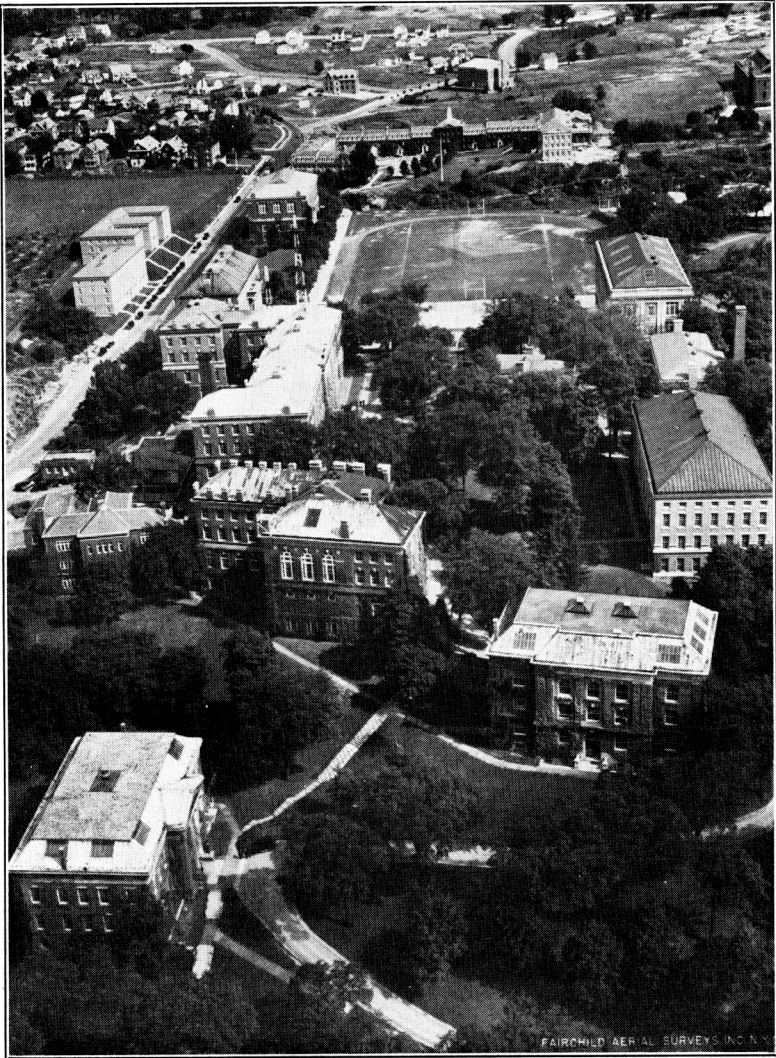
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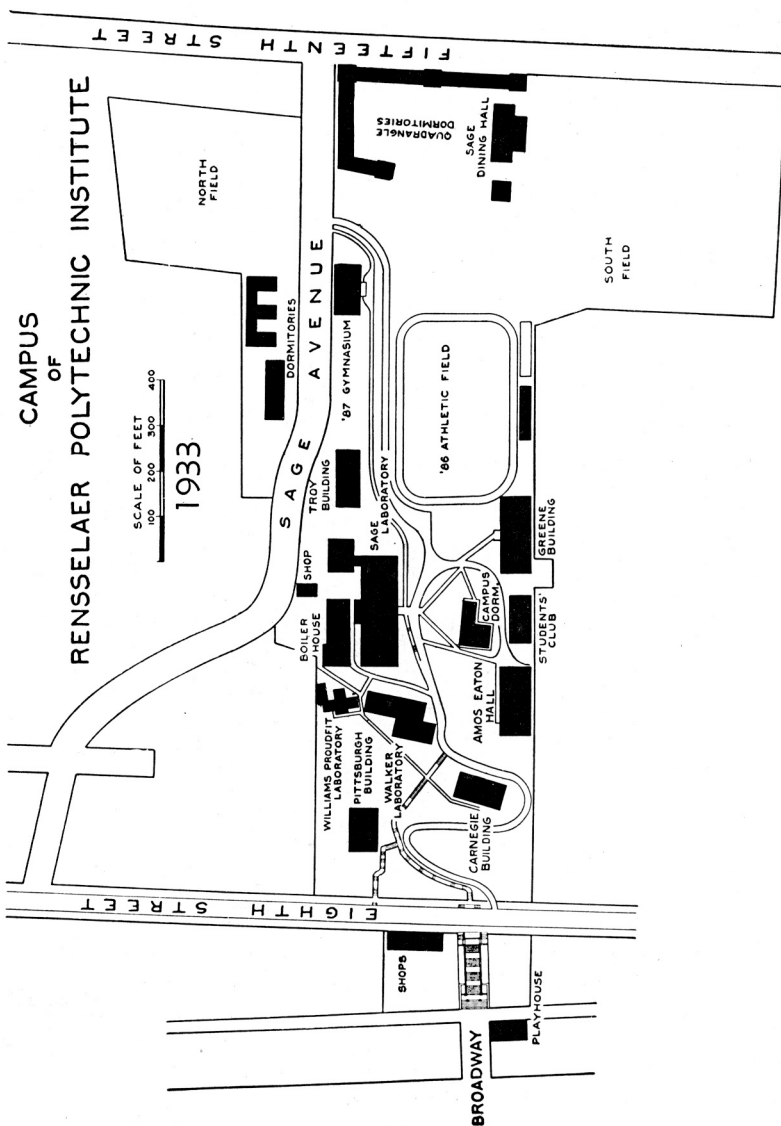
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Air View of Campus, 1933-



CAMPUS  
OF  
RENSSELAER POLYTECHNIC INSTITUTE

SCALE OF FEET  
0 100 200 300 400

1933

FIFTEENTH STREET

TENTH STREET

BROADWAY

NORTH FIELD

SOUTH FIELD

SAGE AVENUE

DORMITORIES

TREY BUILDING

'87 GYMNASIUM

SAGE LABORATORY

'86 ATHLETIC FIELD

SHOP

BOILER HOUSE

WILLIAMS PROUDFT LABORATORY

PITTSBURGH BUILDING

WALTER LABORATORY

AMOS EATON HALL

CAMPUS BOATHOUSE

STUDENTS CLUB

GREENE BUILDING

SAGE DINING HALL  
SAGE QUADRANGLE  
DORMITORIES

SHOPS

PLAY-HOUSE

HISTORY  
OF  
RENSSELAER POLYTECHNIC INSTITUTE  
(1824-1934)

CHAPTER I

THE FOUNDATION OF THE SCHOOL

At the beginning of the nineteenth century the study of the physical sciences in the United States was in its infancy. All branches were included under the terms natural philosophy and natural history. Their meaning was not well defined, although under the former was generally included all of what was then known of astronomy, physics, chemistry, botany, and geology. Scarcely any provision was made for scientific instruction in any of the colleges of the country. Astronomy, physics, chemistry, and botany had indeed been taught during the preceding century in a few institutions of learning, a department of mathematics and natural philosophy having been created at Harvard College as early as 1727, a professorship of botany in Columbia College in 1792, and a chair of chemistry at Princeton in 1795. Instruction had also been given in physics and chemistry at the University of Pennsylvania and Dartmouth College,

and in physics at Union College. This short list, however, includes all the colleges which had given the physical sciences more than an insignificant place in their curriculums. Even in these the instruction was given by lectures, supplemented at times by experiments which the teachers performed; and anything approaching laboratory work by the student was almost wholly unknown. When Professor Silliman was elected, in 1801, to the chair of chemistry, geology, and mineralogy at Yale College, he visited Dr. Maclean, who was professor of chemistry at Princeton, and then for the first time saw experiments in chemistry performed.\* Considering the state of scientific knowledge at this period and the general lack of opportunity for the study of science even in Europe, it is not remarkable that this should have been the case in a new country the total population of which in the year 1800 did not exceed that of the city of London today.

With the general awakening to the value of the natural sciences, during the first quarter of the century, came provision for their study in other of the academic schools of the country. Within that time courses in various branches were inaugurated at Yale, Williams, Bowdoin, Dickinson, William and Mary, and Hobart Colleges, and in the universities of Georgia, North Carolina, and South Carolina. Facilities for practical work by the students were still wanting in nearly all of them, though the appa-

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\* "Education in the United States," Richard G. Boone.

ratus used for illustration had grown in quantity and variety. A chemical laboratory, already mentioned, was in existence at Princeton, one was fitted up at Williams College in 1812, and one at Harvard shortly after this date. A few others were also to be found. They were all, of course, crude and unpretending compared with those thickly scattered over the country today. Nor were the steps taken in the study of science always forward. Thus there was organized in the University of Pennsylvania, in 1816, a department of natural science "with five professors; and annual courses of lectures, to be publicly delivered, were required by the regulations. The courses of instruction embraced natural philosophy, botany, natural history, mineralogy, chemistry applied to agriculture and the arts, and comparative anatomy. The support given by the public, however, was not sufficient to compensate for the efforts put forth, the professors were badly paid, and the department soon fell into neglect. It was abolished shortly after the establishment of the Franklin Institute, in 1824, which rendered, it was said at the time, such a department in the university 'unnecessary.'" \*

The time had now come, not only for the addition of scientific courses to the curriculums of the institutions of learning, but for a general diffusion of scientific knowledge among those who could not have the advantage of an education higher than that afforded by the common schools. Attempts in

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\* "Historical Sketch of the University of Pennsylvania," John L. Stewart. Circular 2, 1892, of the U. S. Bureau of Education.

this direction had already been made in Europe. When Count Rumford returned from Munich to London in 1795 he endeavored to interest the people of England, as he had those of Germany, in his plans for public and domestic economy, more particularly in the economical consumption of coal, improvements in the construction of fireplaces, and the heating of buildings by steam. In 1799 he issued in London a prospectus entitled "Proposals for forming by subscription, in the metropolis of the British Empire, a public institution for diffusing the knowledge and facilitating the general introduction of useful mechanical inventions and improvements, and for teaching, by courses of philosophical lectures and experiments, the application of science to the common purposes of life." The result was the establishment, in the year 1800, of the Royal Institution of Great Britain, which had for its object the purposes outlined in his prospectus.

Other men had not been blind to the benefits which would accrue to civilization if the people generally could be instructed in the application of science to the common purposes of life. Franklin's opinions upon this subject are well known. John Adams believed that the state should make provision for this purpose, as is shown by the following extract from the Constitution of Massachusetts, of 1780, of which he was the principal author: "to encourage private societies and public institutions, rewards and immunities for the promotion of agriculture, arts, sciences, commerce, trades, man-



ufactures, and a natural history of the country." Jefferson also proposed a school of technical philosophy, to be maintained wholly at public expense, where certain of the higher branches should be taught in abridged form to meet practical wants. "To such a school," he wrote, "will come the mariner, carpenter, shipwright, pump-maker, clock-maker, machinist, optician, metallurgist, founder, cutler, druggist, brewer, vintner, distiller, dyer, painter, bleacher, soap-maker, tanner, powder-maker, salt-maker, glass-maker, to learn, as much as shall be necessary to pursue their art understandingly, of the sciences of geometry, mechanics, statics, hydrostatics, hydraulics, hydrodynamics, navigation, astronomy, geography, optics, pneumatics, acoustics, physics, chemistry, natural history, botany, mineralogy, and pharmacy." \*

The influence of such opinions gave impetus to the diffusion of scientific knowledge among the people of this country. Although, as before shown, opportunities had been offered in various colleges and universities for the study of natural science and the Royal Institution for popular lectures on its various branches had been founded in England, there had not been in existence in either country a school originated avowedly for purposes of scientific instruction. During the first quarter of the nineteenth century, however, three schools were established here for each of which the distinction has

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\* "Early History of the University of Virginia, as Contained in the Letters of Thomas Jefferson and Joseph C. Cabell," edited by J. W. Randolph, Richmond, 1856.

been claimed of being the first school created in any English-speaking country for the purpose of teaching science. The earliest was established in Norwich, Vermont, in 1819, by Captain Alden Partridge, a graduate of the United States Military Academy and its superintendent during the years 1815-7. It was called the American Literary, Scientific, and Military Academy, and it appears \* to have been more of a military academy than a school of science. It was evidently modeled after the West Point school. The cadets lived in barracks, and were taken at as early an age as nine years. The curriculum included various languages, English literature, science, as much as was then known of engineering, and many military subjects, including military exercises. The Academy was moved from Vermont to Middletown, Connecticut, in 1825, and was incorporated in that state, but was disbanded in 1829. In the meantime, Captain Partridge had left the Academy in 1827 and had opened in Norwich a small preparatory school. When the Academy was disbanded in Connecticut, he took its name again for his school, which in 1834 was chartered by the legislature of Vermont as Norwich University, and, in 1866, the University was moved to Northfield, in the same state.

The second school was incorporated under the name of the Gardiner Lyceum, in Gardiner, Maine, in 1822, and opened in 1823 by Benjamin Hale, who was graduated from Bowdoin College in 1818

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\* "History of Norwich University," by William A. Ellis. Vol. I, pp. 4-6, 13, 19-51.

and who afterwards became president of Hobart College. In his inaugural address \* delivered January 1, 1823, he said: "It is the object of this institution to give instruction in those branches which are most intimately connected with the arts, and to teach them as the foundation of the arts. . . . It is not sufficient for them, as for the general scholar, to be taught the general laws of chemistry; they must be instructed particularly in the chemistry of agriculture and the arts. It is not sufficient for them to be able to repeat and to demonstrate a few of the general laws of mechanics; they must be taught the application of the laws. They must be made acquainted with machines." The curriculum included various branches of pure mathematics, and natural science, mensuration, surveying, navigation, and theoretical and practical mechanics. The Lyceum existed for about ten years. It was discontinued in consequence of the withdrawal of a legislative appropriation.

The third school, which is the subject of this history, was founded in Troy, New York, by Stephen Van Rensselaer, of Albany, New York, in 1824. It was called the Rensselaer School, and was originated for the purpose of teaching the "application of science to the common purposes of life." Detailed information regarding it, including its early

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\*"An Inaugural Address delivered at Gardiner, Me., January 1, 1823," by Benjamin Hale, principal of the Gardiner Lyceum, and lecturer on natural philosophy. Hallowell. S. K. Gilman, Printer, 1823. A copy of this address, together with several other pamphlets relating to Gardiner Lyceum, is in the Bowdoin College Library.

curriculums, will be given in due course in this history, but reference is made here to give the date of its foundation and its object, in order that a comparison may be made with the two schools previously mentioned.

The primary object of the Norwich Academy was really not the teaching of applied science. It seems to have been a mixture of boarding-school, military academy, classical school, and scientific school. Evidently more applied science, and even engineering, as it was then known, was taught than was taught in the classical colleges of that day. But even if, after all the changes in name and place, Norwich University may be said to be the same school as the American Literary, Scientific, and Military Academy, it is more than doubtful whether it has any right to be called the first school of science to be established in this country. If it has a claim to this distinction, the West Point Military Academy, after which it was modeled, has a greater claim; and this has never been made for it.

Whatever honor may accrue from being the first school established in this country specifically for the purpose of teaching science belongs, I believe, to the Gardiner Lyceum, which was originated about two years earlier than the Rensselaer School, but which soon ceased to be. The Rensselaer Polytechnic Institute is, therefore, I believe, the first school of science and engineering, which has had a continuous existence, to be established in any English-speaking country.

That the founder had definite ideas not only in relation to the purposes of the institution, but also in regard to its general management and the methods of instruction to be pursued, is attested by a letter dated November 5, 1824, to the Rev. Samuel Blatchford, of Lansingburgh. It forms the first official notice of the foundation, and reads as follows:

*Dear Sir:* I have established a school at the north end of Troy, in Rensselaer county, in the building usually called the Old Bank Place, for the purpose of instructing persons, who may choose to apply themselves, in the *application of science to the common purposes of life*. My principal object is, to qualify teachers for instructing the sons and daughters of farmers and mechanics, by lectures or otherwise, in the application of experimental chemistry, philosophy, and natural history, to agriculture, domestic economy, the arts, and manufactures. From the trials which have been made by persons in my employment at Utica, Whitesborough, Rome, Auburn, and Geneva during the last summer, I am inclined to believe that competent instructors may be produced in the school at Troy, who will be highly useful to the community in the diffusion of a very useful kind of knowledge, with its application to the business of living. Apparatus for the necessary experiments has been so much simplified, and specimens in natural history have become subjects of such easy attainment, that but a small sum is now required as an outfit for an instructor in the proposed branch of science; consequently, every school district may have the benefit of such a course of instruction about once in two or three years, as soon as we can furnish a sufficient number of teachers. I prefer this plan to the endowment of a single public institution for the resort of those only whose parents are able and willing to send their children from home or to enter them for several years upon the

Fellenberg plan. It seems to comport better with the habits of our citizens and the genius of our government to place the advantages of useful improvement equally within the reach of all.

Whether my expectations will ever be realized or not, I am willing to hazard the necessary expense of making the trial. Having procured a suitable building advantageously located among farmers and mechanics, and having furnished funds which are deemed sufficient by my agent in this undertaking for procuring the necessary apparatus, etc., it now remains to establish a system of organization adapted to the object. You will excuse me if I attach too much consequence to the undertaking. But it appears to me that a board of trustees to decide upon the manner of granting certificates of qualifications, to regulate the government of students, etc., is essential. I, therefore, take the liberty to appoint you a member and president of a board of trustees for this purpose. I appoint the following gentlemen trustees of the same board: The Rev. Dr. Blatchford and Elias Parmalee, of Lansingburgh; Guert Van Schoonhoven and John Cramer, Esqs., of Waterford; Simeon DeWitt and T. Romeyn Beck, of Albany, John D. Dickinson and Jedediah Tracy, of Troy. And I appoint O. L. Holley, Esq., of Troy, and T. R. Beck, of Albany, first and second vice-presidents of said board.

As a few regulations are immediately necessary in order to present the school to the public, it seems necessary that I should make the following orders, subject to be altered by the trustees after the end of the first term.

*Order 1.* The board of trustees is to meet at times and places to be notified by the president, or by one of the vice-presidents, in the absence or disability of the president. One-half of the members of the board are to form a quorum for doing business. A majority of the members present may fill any vacancy which happens in the board; so that there may be two members resident in Troy, two in Lansingburgh, two in Waterford, and two in Albany. The powers

and duties of the trustees to be such as those exercised by all similar boards, the object of the school being always kept in view.

*Order 2.* I appoint Dr. Moses Hale, of Troy, secretary, and Mr. H. N. Lockwood, treasurer.

*Order 3.* I appoint Amos Eaton, of Troy, professor of chemistry and experimental philosophy, and lecturer on geology, land surveying, and the laws regulating town officers and jurors. This office to be denominated the senior professorship.

*Order 4.* I appoint Lewis C. Beck, of Albany, professor of mineralogy, botany, and zoology, and lecturer on the social duties peculiar to farmers and mechanics. This office to be denominated the junior professorship.

*Order 5.* The first term is to commence on the first Monday in January next, and to continue fifteen weeks. For admission to the course, including the use of the library and reading-room, each student must pay twenty-five dollars to the treasurer, or give him satisfactory assurances that it will be paid in one year. In addition to this, each section of students must pay for the chemical substances they consume and the damage they do to apparatus.

*Order 6.* All the pay thus received by the treasurer, as for parts of courses of instruction, is to be paid over to said professors as the reward of their services.

*Order 7.* In giving the course in chemistry, the students are to be divided into sections, not exceeding five in each section. These are not to be taught by seeing experiments and hearing lectures, according to the usual method. But they are to lecture and experiment by turns, under the immediate direction of a professor or a competent assistant.\* Thus by a term of labor, like apprentices to a trade, they are to become operative chemists.

*Order 8.* At the close of the term each student is to give sufficient tests of his skill and science before examiners, to be appointed by myself, or by the trustees, if I do not appoint. The examination is not to be conducted by ques-

*tion and answer, but the qualifications of students are to be estimated by the facility with which they perform experiments and give the rationale,\** and certificates or diplomas are to be awarded accordingly.

*Order 9.* One librarian, or more, to be appointed by the professors, will be keeper of the reading-room. All who attend at the reading-room are to respect and obey the orders of the librarian in regard to the library and conduct while in the room.

*Order 10.* Any student who shall be guilty of disorderly or ungentlemanly conduct is to be tried and punished by the president or vice-president and two trustees. The punishment may extend to expulsion and forfeiture of the school privileges, without a release from the payment of fees. But a student may appeal from such decision to the board of trustees.

This instrument, or a copy of it, is to be read to each student before he becomes a member of the school; and he is to be made to understand that his matriculation is to be considered as an assent to these regulations.

STEPHEN VAN RENSSELAER.

ALBANY, Nov. 5, 1824.

This document shows the aim of the founder of the Rensselaer School to have been substantially that of the originator of the Royal Institution, though the methods pursued in attaining the object sought were different. He was doubtless familiar with the work and writings of Rumford, and it will be noticed that he has used in his description of the purpose of the school the same expression found in the London prospectus of 1799—"the application

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\* The italics are mine. P. C. R.



of science to the common purposes of life." \* Attention will be given later to the peculiar methods of instruction outlined in this letter, and before proceeding with the history of the school a short account will be given of the lives of its founder and of another to whose talent as a teacher and scientific investigator the success of the school was largely due.

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\* See the address of President James Forsyth in *Proceedings of the Semi-Centennial Celebration of the Rensselaer Polytechnic Institute*, 1874.

## CHAPTER II

### STEPHEN VAN RENSSELAER AND AMOS EATON

STEPHEN VAN RENSSELAER was the fifth in direct line of descent from Killian Van Rensselaer, a merchant of Holland, who obtained by purchase from the Indians, about the year 1637, a district about twenty-four miles in breadth by forty-eight in length, comprising the territory which has since become the counties of Albany, Columbia, and Rensselaer, in the State of New York. He named it the Colony and Manor of Rensselaerwyck, and was its first patroon. Stephen was born November 1, 1764, in the City of New York. His father was Stephen Van Rensselaer, the seventh proprietor or patroon of Rensselaerwyck, and his mother was Catharine, the daughter of Philip Livingston. Upon the death of his father in 1769, the care of the estate, which fell exclusively to him by the law of primogeniture, devolved upon his uncle, General Ten Broeck, who also acted as guardian during his minority. He was at first sent to a school in Albany and afterwards to one in Elizabethtown, New Jersey. At the beginning of the Revolution he was removed to Kingston, New York, and acquired the elements of a classical education at the Kingston Academy. He was later sent to Prince-

ton College, but in consequence of its proximity to the seat of war, it was thought advisable to send him to Harvard College, where he was graduated as a Bachelor of Arts in 1782, in the nineteenth year of his age. Returning to Albany he married, in 1783, a daughter of General Philip Schuyler, and upon reaching his majority settled down in the Manor House and took charge of his estates. By offering leases for long terms at a very moderate rent, he succeeded in bringing a large portion of his land into cultivation, but little of which had, until then, been converted into farms, and thus secured for himself a competent income.

He was made a major of infantry in 1786, and when, in 1801, Governor Jay formed the cavalry of the state into a separate corps he was placed in command with a commission of major-general of cavalry. He was elected, as a federalist, to the Assembly of the state in 1789, and the next year became a state senator, which position he held until 1795, when he was chosen lieutenant-governor at the same time that John Jay was elected governor. He was lieutenant-governor for six years, and was nominated for governor in 1801, but was defeated by DeWitt Clinton. In the same year he was a member of the constitutional convention, and presided over it during the greater part of its deliberations. He was again elected to the Assembly in 1807, and when, during this term, a project was agitated to appoint a commission for exploring a route for a western canal, he was strongly in favor of it. Having been appointed, in 1810, to

serve on this commission, he, in company with the other members, made an exploration of the route for a canal from the Hudson River to Lake Erie.

When war with Great Britain was declared in 1812, he was given the command of the state militia, and on the thirteenth of October of that year assaulted and took the Heights of Queens-town, Canada, from which, however, he was compelled to withdraw by the refusal of the state militia, under the plea of constitutional scruples, to leave the state. His services in the field ended with this campaign, and in 1813 he was again nominated for governor, but was defeated by a small majority. In the meantime, the canal commission had continued its existence, and in 1816, when the Legislature directed the construction of the Erie Canal and committed the execution of the work to a board of canal commissioners, he was made a member of that body, and was its president from April, 1824, until his death. He was again elected a member of Assembly in 1816, in 1819 became a regent of the State University, of which he was chancellor from 1835 until his death, and was a member of the constitutional convention of 1821.

From his position as patroon and because of the great extent of territory he possessed, as well as on account of his great intelligence and the benevolence of his nature, Stephen Van Rensselaer had always been strongly in favor of the encouragement of farmers and the improvement of agriculture. When, therefore, in 1819, an act for the encouragement of agriculture was passed by the

Legislature of the state, under the provisions of which delegates from county societies formed a Central Board of Agriculture, he was elected its president at the first meeting in Albany, in January, 1820. Although the life of the board was brief, it was long enough to permit a geological and agricultural survey of the counties of Albany and Rensselaer to be made under its direction, though at the expense of its president. This survey was executed by Professor Amos Eaton with the aid of two assistants, and was the first attempt made in this country to collect and arrange geological facts with a direct view to the improvement of agriculture. Analyses of soils were included, as well as a consideration of the proper methods of culture adapted to them, and the results were published in three volumes of "Transactions and Memoirs." Imbued with strong opinions as to the value of such scientific investigations, when the board ceased to exist Stephen Van Rensselaer was unwilling to discontinue work of this character, and in the years 1822 and 1823 he caused to be made, at his own expense, under the direction of Professor Eaton, a geological survey extending from Boston to Lake Erie, a distance of about five hundred and fifty miles. It embraced a belt fifty miles in width, which covered, in this state, the line of the Erie Canal.

The intelligence and benevolence of the subject of this sketch were now, when he had reached the age of sixty years, to be directed into a new channel. He had long been interested in the instruction

of the poorer families of his tenantry, and had reached the conclusion that the most valuable education to be given the masses engaged in the ordinary occupations of life was one which would enable them to apply the principles of science to the "business of living." His first step in this direction was to secure the services of Professor Eaton, with whose qualifications he was thoroughly familiar. He employed him, in the summer of 1824, to traverse the state on or near the line of the Erie Canal, provided with sufficient apparatus and specimens to deliver, in all the principal towns where an audience of business men or others could be collected, a series of lectures, accompanied with experiments and illustrations, on "chemistry, natural philosophy, and some or all the branches of natural history." This undertaking was entirely successful. Encouraged by it, he determined to establish an institution one of the principal objects of which should be "to qualify teachers for instructing the sons and daughters of farmers and mechanics, by lectures or otherwise, in the application of experimental chemistry, philosophy and natural history to agriculture, domestic economy, the arts, and manufactures"; and there resulted the foundation at Troy, New York, in 1824, of the school which is the subject of this historical sketch. He at first intended to sustain the school for three years only, expecting that, if at the end of this period it were successful, the public would maintain it. However, besides the expense of its original establishment, he bore, until his death fourteen years later, about one-half the

cost of its maintenance. As will be seen hereafter, the course of instruction was considerably enlarged, during his life and with his approval, to meet the growing demand for educated engineers and scientific men.

In the meantime, in 1823, General Van Rensselaer had been elected to Congress as a representative from Albany County, and some of his instructions in relation to the new school were forwarded from Washington. He continued in Congress for six years, and was during this period chairman of the Committee on Agriculture. During a part of his active public life, from 1793 until his resignation in 1819, he was a trustee of Williams College. In 1825 the degree LL.D. was conferred on him by Yale College. He died at the old Manor House in Albany on the twenty-sixth day of January, 1839, in the seventy-fourth year of his age.\*

Although distinguished because of his position and character, and on account of many years of successful public service in important positions, the memory of Stephen Van Rensselaer will be perpetuated chiefly by means of the school which he established for the benefit of his fellow-men.

In an article on the Institute, one of an interesting series on the engineering schools of the United States, written in 1892 for *Engineering News*, A. M. Wellington says: "The founder was not of the class of rich men who found colleges only from a vague philanthropic instinct and to perpetuate his

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\* See "A Discourse on the Life, Services and Character of Stephen Van Rensselaer," by Daniel G. Barnard, Albany, 1839.

name. He had distinct and very original and decided views as to proper methods of instruction, which he took great pains to provide for and enforce at length. His love of thoroughness, his determination that the instruction should be of the best, if there was any, and that the school should take a high rank among the kindred institutions of the world, crop out constantly in his letters and deed of foundation. . . . He was no common founder, and he founded no common school. The cause of engineering education owed much to him indeed."

It will be noticed in the account just given of his life that in all his efforts for the advancement of scientific knowledge, whether by agricultural and geological surveys or by the more direct method of instruction, he employed one individual as his agent. That no error was made in the choice is proved by the uniform success of his endeavors.

Amos Eaton was indeed no ordinary man. The history of the last seventeen years of his life is identical with that of Rensselaer Institute. The importance of his work, however, not only in the early development of the school but as a scientific investigator and author of works on the natural sciences, renders it advisable to give, in this connection, a sketch of his earlier history. He was a native of Chatham, New York, and was born May 17, 1776. His father, Abel Eaton, was a farmer in comfortable circumstances. Amos early manifested superior abilities, and was selected to deliver an oration on the Fourth of July, 1790, when but





*S. Van Men's laes*



*Amos Eaton*

fourteen years of age. About this time, having acted as chainman during a land survey, he determined to become a surveyor. Not having the requisite instruments, he interested a skilful blacksmith in his behalf, who agreed to work for him at night if he would "blow and strike" by day. A needle and a good working chain were the result of several weeks' work. This circumstance in his life doubtless gave rise to the remark, found in *Silliman's Journal*, that "in 1791 he was an apprenticed blacksmith." The bottom of an old pewter plate, well smoothed, polished, and graduated, served as a compass-circle, so that Eaton, when sixteen years old, was in the field with his home-made instruments, doing occasional surveying in the neighborhood. He aspired, however, to higher attainments and, encouraged by his parents, was fitted for college at Spencertown, New York, and was graduated at Williams College, in 1799, with a high reputation for scientific knowledge. In the same year he began the study of law at Spencertown, and subsequently continued his studies in New York.

At this time he first became interested in the study of botany and other natural sciences. While in New York, in 1802, he borrowed Kirwan's "Mineralogy," then a scarce book, and made a manuscript copy of the entire work. He was admitted to the bar, at Albany, in 1802, and soon after established himself as a lawyer and land agent in Catskill, New York. Here he remained several years, his position affording him excellent opportunities

for cultivating his growing taste for the natural sciences. In May, 1810, he made in Catskill, it is believed, the first attempt in this country at a popular course of lectures on botany, compiling for the use of his class a small elementary treatise. For this Dr. Hosack, who had formerly taught him in New York, complimented him as being the "first in the field."

Having found his love for the details of his profession diminishing and his interest in the natural sciences increasing, he finally resolved to abandon the practice of law and to fit himself more thoroughly for scientific pursuits. With this end in view he went to New Haven, in 1815, to avail himself of the advantages found at Yale College. He placed himself under the instruction of Professor Silliman, who threw open to him his lectures on chemistry, geology, and mineralogy, as well as his own library and the cabinet of minerals of that institution. Here, also, he found a good botanist in Dr. Eli Ives, professor of botany and materia medica in the medical department of the college, who had accumulated a good library, to which he gave Eaton free access. With these advantages and his already advanced acquirements he was soon well qualified as an explorer and teacher. Returning to Williamstown in 1817, he gave courses of lectures in botany, mineralogy, and geology to volunteer classes of students. His influence in the college was remarkable, and he awakened there an interest in the natural sciences which has never died out. His pupils published, in 1817, the first

edition of his "Manual of Botany," a 12mo of 164 pages, which, as the late Dr. Lewis C. Beck wrote in 1852, "gave an impulse to the study of botany in New England and New York, as the only descriptive work which was then current was that of Pursh, an expensive one with Latin descriptions." This work was improved by repeated revisions and additions, and became, in the eighth edition, published in 1840, a large octavo volume of 625 pages, which was entitled "North American Botany," and contained a description of 5,267 species of plants.

An idea of his labors as an author and investigator may be obtained from a list of his works. He published an "Elementary Treatise on Botany," 1810; "Manual of Botany," 1817; "Botanical Dictionary," 1817; "Botanical Exercises," 1820; "Botanical Grammar and Dictionary," 1828; "Chemical Note Book," 1821; "Chemical Instructor," 1822; "Zoological Syllabus and Note Book," 1822; "Cuvier's Grand Division," 1822; "Art Without Science," 1800; "Philosophical Instructor," 1824; "Directions for Surveying and Engineering," 1838; "Index to the Geology of the Northern States," 1818; "Geological and Agricultural Survey of the County of Albany, N. Y.," 1820; "Geological and Agricultural Survey of Rensselaer County," 1822; "Geological Nomenclature of North America," 1822; "Geological and Agricultural Survey of the District adjoining the Erie Canal," 1824; "Geological Text Book," prepared for popular lectures on North American geology, 1830; "Geological Note Book for Troy Class,"

1841. Of most of these works a number of different editions were published.

In after years his memory as a botanist was honored by Professor Gray, who named for him two species of plants, the *Eatonia obtusata* and *Eatonia Pennsylvanica*.

The encouragement received by Eaton at Williams College determined him to give courses of popular scientific lectures, accompanied with practical instructions, to such classes as he might be able to organize in several of the larger towns of New England and New York. These met with great success, and in the course of two or three years he diffused a great amount of scientific knowledge, and there sprang up as the result of his labors an army of young botanists and geologists. According to Professor Albert Hopkins, of Williams College, he was one of the first to popularize science in the Northern States, and was one of the first in this country to study nature in the field, with his classes.

In 1818, in compliance with a special invitation from Governor DeWitt Clinton, he went to Albany and delivered a course of lectures before the members of the Legislature. Here he became acquainted with many of the leading men of the state, interesting them especially in geology and its application, by means of surveys, to agriculture. A train of causes was thus set in operation which resulted in giving to the world that great work, "The Natural History of New York," so creditable to the state and to the scientific men who executed it, of whom

several had been Professor Eaton's pupils. In this year he published the first edition of his "Index to the Geology of the Northern States," which was the first attempt at a general arrangement of the geological strata in North America. In his "Education in the United States," Boone says: "Among the older geologists, and one of the first to study nature in the field, was Professor Amos Eaton of Williams College. He has been called the 'Father of American Geology,' was the instructor of Hall, Dana and Williams, and initiated the interest in a half dozen States."

He afterwards delivered several courses of lectures in the medical college at Castleton, Vermont, in which he was appointed professor of natural history in 1820. In this year and the following one he made the geological and agricultural surveys of Albany and Rensselaer counties to which reference has been made in the sketch of the life of Stephen Van Rensselaer. Of these surveys Professor Silliman remarked, in his *Journal*, "The attempt is novel in this country"; adding, "We are not aware of any attempt on so extensive and systematic a scale, to make them subservient to the important interests of agriculture." There has also been mentioned previously the geological survey of the district adjoining the Erie Canal, made by Professor Eaton in 1822 and 1823. A report of this survey, consisting of 160 octavo pages, with a profile section of rock formations from the Atlantic Ocean, across the states of Massachusetts and New York, to Lake Erie, was published in 1824. In

relation to this work Governor Seward, in his introduction to the "Natural History of the State of New York," said: "This publication marked an era in the progress of geology in this country. It is in some respects inaccurate, but it must be remembered that its talented and indefatigable author was without a guide in exploring the older formations, and that he described rocks which no geologist had, at that time, attempted to classify. Rocks were then classified chiefly by their mineralogical characters, and the aid which the science has since learned to derive from fossils, in determining the chronology and classification of rocks, was scarcely known here and had only just begun to be appreciated in Europe. We are indebted, nevertheless, to Professor Eaton for the commencement of that independence of European classification which has been found indispensable in describing the New York system." He also said: "Professor Eaton enumerated nearly all the rocks in western New York, in their order of succession; and his enumeration has, with one or two exceptions, proved correct. It is a matter of surprise that he recognized, at so early a period, the old red sandstone on the Catskill mountains, a discovery the reality of which has since been proved by fossil tests."

Such was the man chosen by Stephen Van Rensselaer to take charge, as senior professor and agent, of the institution which he established in 1824. Eaton's enthusiasm and remarkable powers as a teacher doubtless had their influence in determining him to bear the expense of the series of

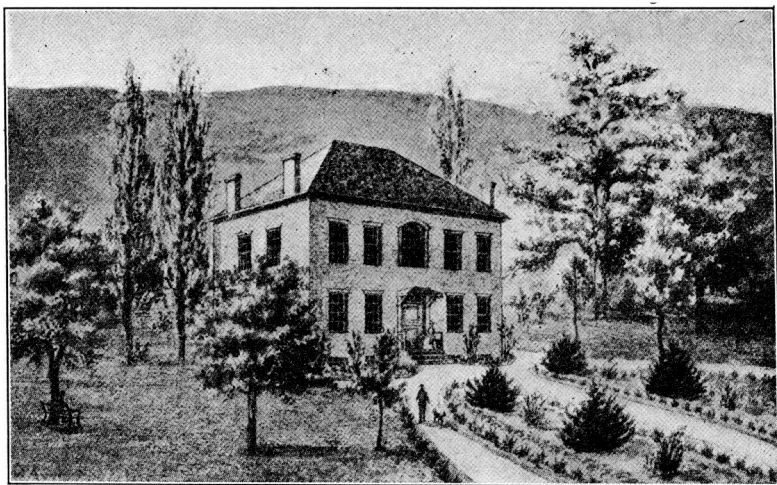


lectures in towns along the Erie Canal, and afterwards to undertake the creation of the school. And it does not detract from the credit of the founder to say that the methods and the object of the institution, as set forth in his letter to Dr. Blatchford, were, if not wholly, at least partly due to its first senior professor.

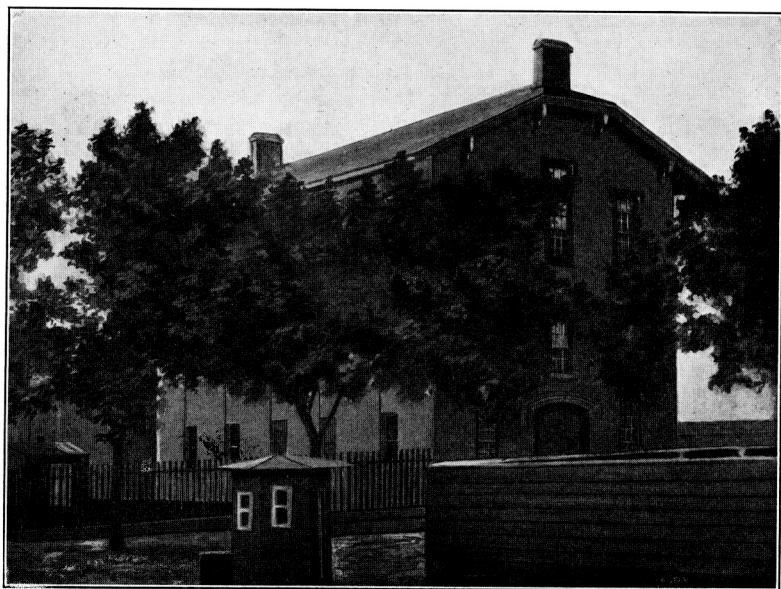
The last seventeen years of his life were passed in Troy as senior professor in Rensselaer School or Rensselaer Institute, the name by which it was known after 1833. He died on the tenth day of May, 1842, in the sixty-sixth year of his age. His remains are buried in Oakwood Cemetery in Troy. A great rough-cut granite block, symbolic of his work and character, marks his last resting-place. In the minutes of the board of trustees, of that time, we find this tribute to his memory: "It is but simple justice to say that Professor Eaton was, under its distinguished patron and benefactor, the founder of this school of the natural sciences; that he was a faithful and successful instructor in these studies, and that he contributed, by his labors in the Institute and by his geological survey of the State of New York, more than any other man in our country to the cultivation of geological science. While the trustees consider the experiment, as to the mode of communicating knowledge adopted in the Rensselaer Institute, as a successful one, they are fully persuaded that much of this success is due to the industry and enthusiasm of Professor Eaton. Few men were ever more devoted to the peculiar duties of his profession than he, and his persever-

ance was equal to his devotedness. His removal may be considered not only as a loss to our city, but to our country."

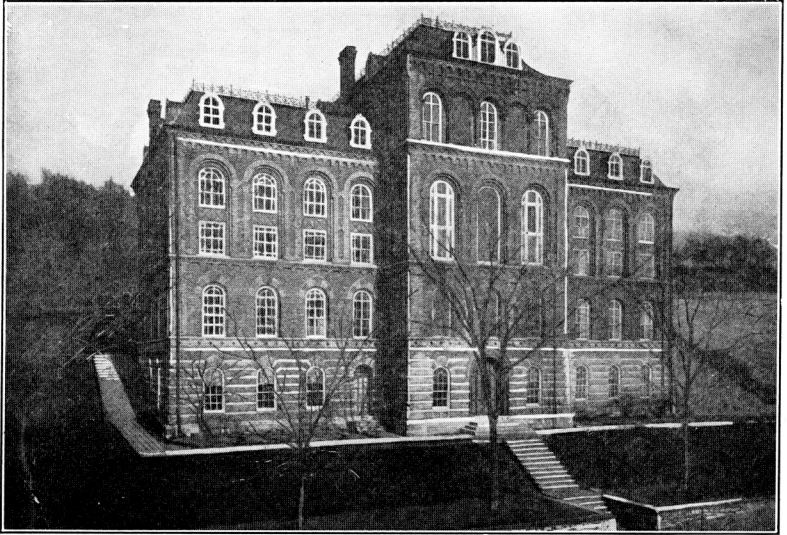
Eaton was a genius; a man of uncommon intellectual power and capacity for work with very unusual gifts as a teacher and investigator. Reference has been made to his work as a man of science in the field and as an author. He was not less original as a teacher. The unusual method of instruction outlined in the first "regulations" of the founder, and more fully explained at another point in this history, was due to him. He originated the method of instruction by which the student himself experimented and gave lectures and for this purpose he created the first laboratories for the systematic individual work of students themselves to be used in any country. This short sketch of his life will be closed by tributes from men well qualified to judge his work. Rev. Calvin Durfee in his history of Williams College (1860), from which most of this account of the life of Eaton is taken, says: "The history of natural science, on this continent, can never be faithfully written without giving the name of Amos Eaton an honorable place. It was he, more than any other individual in the United States, who, finding the natural sciences in the hands of the learned few, by means of his popular lectures, simplified text-books and practical instructions, threw them broadcast to the many. He aimed at a general diffusion of the natural sciences, and nobly and successfully did he accomplish his mission."



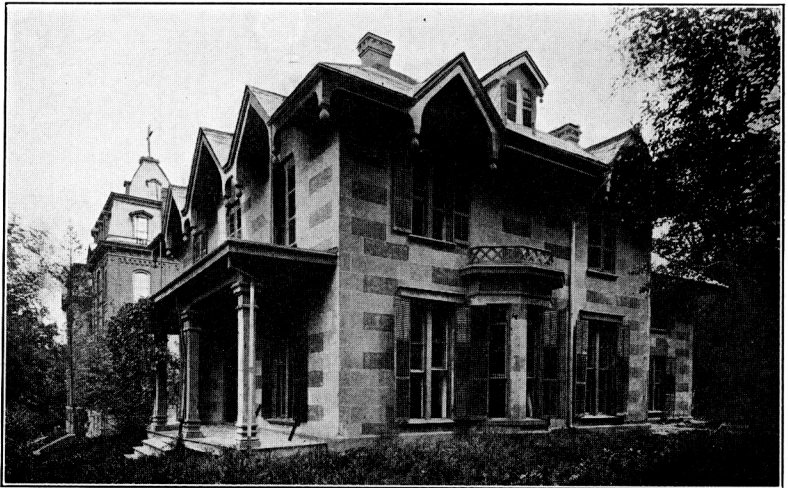
Van der Heyden Mansion, 1834-41



Building on the Infant School Lot, 1844-62



Main Building, 1864-1904



Ranken House, 1877-1910

Charles R. Mann wrote: "Thus the first American Engineering School owed its existence to the fact that a man of rare power as a teacher had been found to conduct it. Following the inspiration embodied in it by Amos Eaton, the Rensselaer School was for forty years a Mecca for teachers of applied science. The published works of Professor Eaton prove that he was also a scientific investigator of rare merit." \*

James Hall, of the class of 1832, a pupil of Eaton's, said of him, "a man capable of interesting young men, having a brain one fourth larger than that of the mass of mankind and that brain devoted to the service of science. If we, with great means, do what he did with small, we shall deserve well of coming generations." †

Dr. Ray Palmer Baker in "A Chapter in American Education" says, "Eaton was one of the great figures in the history of science in the United States. . . . An original genius of profound and far reaching intellect." §

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\* "A Study of Engineering Education," by Charles Riborg Mann. Published by the Carnegie Foundation for the Advancement of Teaching. Bulletin 11, 1918.

† "Celebration of the Semi-centennial of the Establishment of Rensselaer Polytechnic Institute," 1874. Oration by James Hall, New York State Geologist and Paleontologist.

§ "A Chapter in American Education," by Ray Palmer Baker. Charles Scribner's Sons, New York, 1925.

## CHAPTER III

### ACT OF INCORPORATION AND EARLY BY-LAWS

SHORTLY after the receipt of Stephen Van Rensselaer's letter, given in the first chapter, the Rev. Dr. Blatchford called together the board of trustees of the new school. The first meeting was held December 29, 1824, and the institution was then named the "Rensselaer School." An outline of the method of instruction to be pursued may be gathered from the minutes of the proceedings of this meeting, during which it was:

*Resolved*, That persons attending the courses of instruction at Rensselaer School be distributed into three classes, viz. : a Day Class, an Afternoon Class and an Evening Class.

The exercises of the Day Class, for six hours in each day, except Sunday, shall consist of experiments in chemistry, performed by themselves, and in giving explanations, or the *rationale* of the experiments; and they shall undergo daily examinations and alternately become examiners themselves. Each member of this class shall pay \$25 a term (as prescribed by the founder in the orders promulgated by him), and at the end of each term shall be examined for his certificate.

The Afternoon Class shall consist of those who may have previously attended one or more courses of lectures on chemistry at some public institution. They will hear no afternoon lectures; but their exercises will consist of a course of experiments in chemistry, performed by them-

selves, as above, with the *rationale*, conducted under the superintendence of the senior professor. These exercises will occupy three hours in the afternoon of each week-day except Saturday. Each member of this class shall pay \$10 a term, and at the end of each term undergo an examination for his certificate.

The Evening Class will attend lectures, on three evenings of each week, for ten weeks. This course of lectures will embrace chemistry, experimental philosophy, and the outlines of mineralogy, geology, botany, and zoology. The charge for attendance will be \$5. Members of this class will not be examined at the end of the term, but may have certificates of attendance.\*

The opening of the school on Monday, January 3, 1825, was announced by a notice, signed by the president, printed in the *Troy Sentinel* of December 28. The announcement reads, in part, as follows:

The Hon. Stephen Van Rensselaer having established a school near the northern limits of Troy for teaching the physical sciences with their application to the arts of life; having appointed Profs. A. Eaton and L. C. Beck to give courses of instruction particularly calculated to prepare operative chemists and practical naturalists, properly qualified to act as teachers in villages and school districts; having appointed an agent and furnished him with funds for procuring apparatus and fitting up a laboratory, library-room, etc.; and the agent having given notice to the president of the institution that the requisite collections and preparations are completed, it seems proper to give public notice of these circumstances.

Accordingly the public is respectfully notified that everything is in readiness at the Rensselaer School for giving instruction in chemistry, experimental philosophy and

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\* *Troy Sentinel*, January 4, 1825.

natural history, with their application to agriculture, domestic economy, and the arts; and also for teaching land surveying. . . .

During the day no lectures will be given by the professors, but under their superintendence the students, divided into sections, will perform all the experiments and give the explanations, the students thus acting as lecturers and the professors as auditors. . . .

Students who wish for *extra* accommodations will pay from \$1.75 to \$2.00 a week for board and lodging. But any number of students can have good plain board and lodging near the school for \$1.50 a week.

The courses and methods thus set forth are seen to be those outlined in the letter of the founder, with the orders accompanying it; and the trustees, instructors, and other officers were the persons named by him in the same document. Being at this time a member of Congress, Mr. Van Rensselaer wrote from Washington another letter to Dr. Blatchford, dated February 11, 1825, in which a draft of by-laws for the further government of the institution was enclosed:

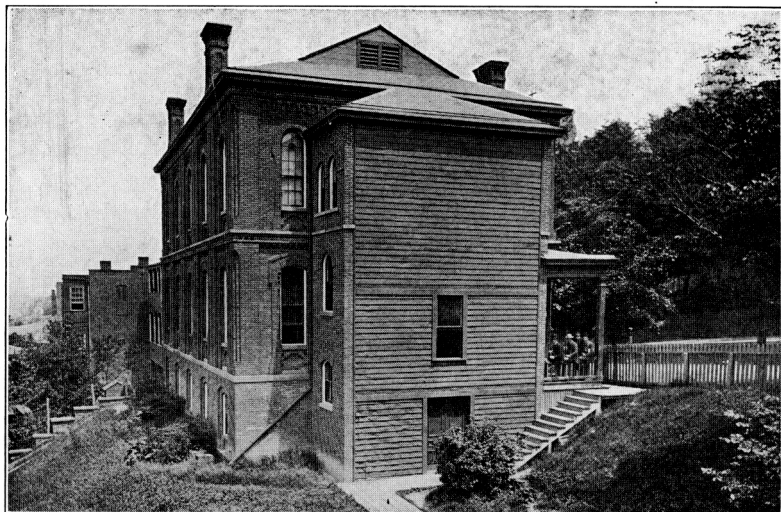
WASHINGTON, February 11, 1825.

*Dear Sir:* I offer my acknowledgements for the interest you have taken in promoting the school over which you preside. I have enclosed a draft, hastily drawn up, of by-laws, for the government of the school, which I beg to submit to yourself and the gentlemen associated with you for consideration and amendment. I flatter myself that the school will succeed and that the advantages I anticipated will be realized.

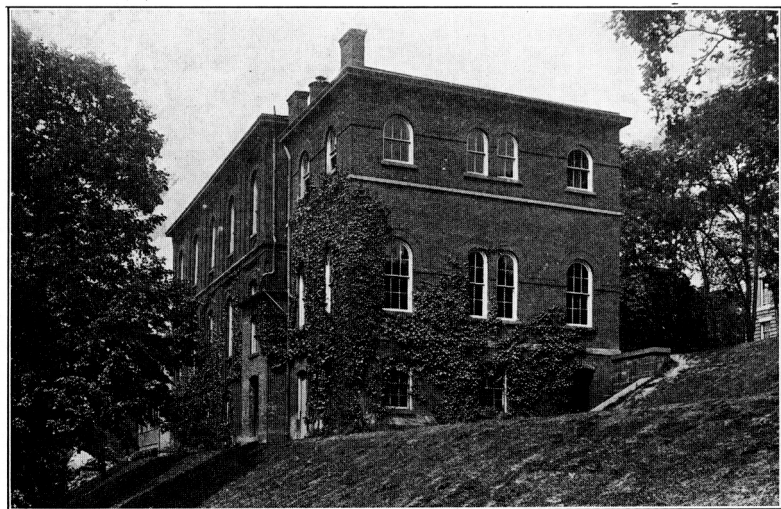
With respect, yours sincerely,

S. V. RENSSELAER.

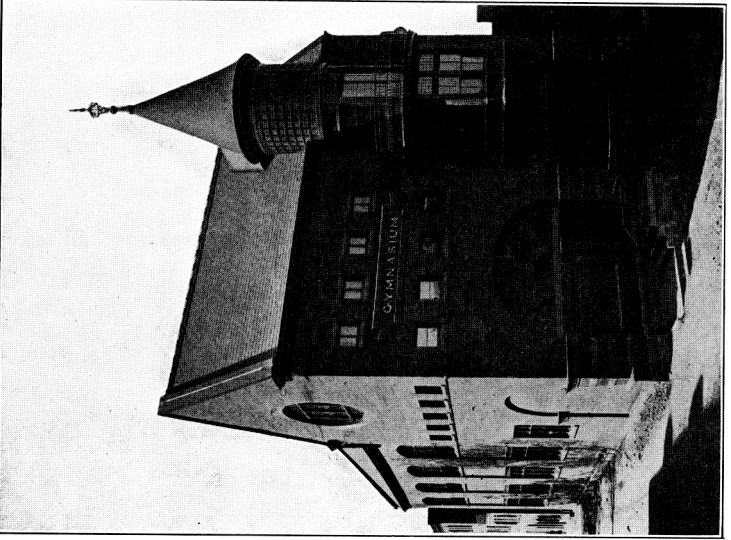




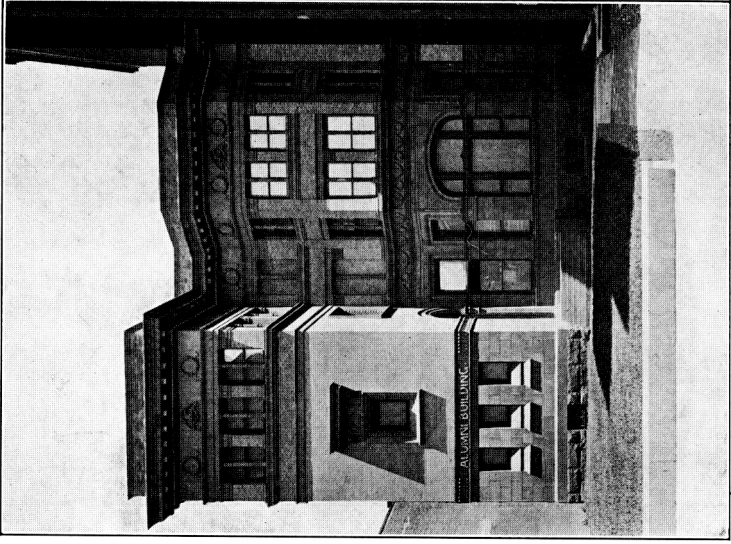
Winslow Chemical Laboratory, 1866-1902



Winslow Laboratory, 1902-06; Shop, 1907-



Old Gymnasium, 1887-1913  
Now the Students' Play House



Alumni Building, 1892-1912

[ENCLOSED DRAFT]

1. That there be two terms in each year, of twelve or fifteen weeks each, to be called the summer term and winter. The summer term to commence in May, the winter term to commence in January—say, the last of May and January.

2. That during the summer term the students shall be taught the elementary principles of the science of chemistry, experimental philosophy, natural history, land surveying, etc., with their application to agriculture, manufactures, and the arts.

3. That, with the consent of the proprietors, a number of well-cultivated farms and workshops in the vicinity of the school be entered on the records of the school as places of scholastic exercise for students, where the application of the sciences may be most conveniently taught.

4. That during the winter term students be exercised in giving lectures, by turns, on all the branches taught in the summer term, under the direction of the professors or their assistants, in order to qualify them for giving instruction in these branches. And that a course of evening lectures be given in the winter term, by the professors, so as to embrace elementary views of the whole course of instruction given at the school.

5. That an annual commencement be held in April at the close of the winter term, for conferring diplomas on those qualified.

This letter, and the previous one from Mr. Van Rensselaer dated November 5, 1824, are important documents in the history of the School. They, with the draft enclosed with the last one, were adopted as its constitution at a meeting of the board of trustees held at the Old Bank Place, March 11, 1825.\*

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\* The Constitution and Laws of Rensselaer School in Troy, New York. Adopted by the board of trustees, March 11, 1825. Printed

After about fourteen months of successful trial the school was incorporated by the following act, passed March 21, 1826:

AN ACT TO INCORPORATE THE RENSSELAER SCHOOL †

*Whereas*, the honorable Stephen Van Rensselaer has procured suitable buildings in the city of Troy, in Rensselaer county, and therein set up a school, and at his own private expense has furnished the same with a scientific library, chemical and philosophical; instruments for teaching land surveying and other branches of practical mathematics, which are useful to the agriculturist, the machinist, and to other artists, has caused to be prepared and furnished separate and commodious rooms for instruction in natural philosophy, natural history, the common operations in chemistry, and an assay-room for the analysis of soils, manures, mineral and animal and vegetable matter, with the application of these departments of science to agriculture, domestic economy, and the arts: *And whereas*, said Van Rensselaer has employed teachers, and caused an experimental system of instruction to be adopted by them, whereby each student is required to observe the operations of a select number of agriculturists and artists in the vicinity of said school, and to demonstrate the principles upon which the results of such operations depend, by experiments and specimens performed and exhibited by his own hands, under the direction of said teachers: *And whereas*, one important object of said school is to qualify teachers for instructing youths in villages and in common-school districts, belonging to the class of farmers and mechanics, by lectures or otherwise, in the application of the most important principles of experimental

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by Tuttle and Richards, 1825. The By-Laws were also printed in this pamphlet together with a description of the library, apparatus, and natural history specimens and an estimate of the cost of board and lodging for the students.

† Laws of the State of New York, 1826, Chap. 83.

chemistry, natural philosophy, natural history, and practical mathematics to agriculture, domestic economy, the arts, and manufactures: *And whereas*, the trustees of said school, who were appointed to take charge thereof, by said Van Rensselaer, by an instrument in writing dated November the fifth, in the year eighteen hundred and twenty-four, have represented to this Legislature, that after having tested the plan of said school by a trial of one year, they find it to be practicable and in their opinion highly beneficial to the public: *And whereas*, the Legislature considers it to be their duty to encourage such laudable efforts and such munificent applications of surplus wealth of individuals: Therefore

1. *BE it enacted by the People of the State of New York, represented in Senate and Assembly*, That Simeon De Witt, Samuel Blatchford, John D. Dickinson, Guert Van Schoonhoven, Elias Parmalee, Richard P. Hart, John Cramer and Theodore Romeyn Beck, shall be and hereby are constituted a body corporate and politic, by the name of "the president and trustees of Rensselaer School," and by that name they shall have perpetual succession, and shall be capable of suing and being sued, pleading and being impleaded, answering and being answered unto, defending and being defended, in all courts and suits whatsoever; and may have a common seal, with power to change or alter the same from time to time, and shall be capable of purchasing, taking possession of, holding and enjoying to them and their successors any real estate, in fee simple or otherwise, and any goods, chattels, and personal estate, and of selling, leasing, or otherwise disposing of the said real and personal estate, or of any part thereof, at their will and pleasure. *Provided however*, That the funds of said corporation shall be used for and appropriated to the objects contemplated in the preamble of this act; *And provided also*, That the clear annual income of such real and personal estate shall not exceed the sum of twenty thousand dollars.

2. *And be it further enacted*, That the said trustees shall, from time to time, forever hereafter have power to make,

constitute, ordain, and establish such by-laws and regulations as they shall judge proper, for the election of the officers and prescribing their respective functions, for the government of the officers and students of said school as to their respective duties, for collecting fines, impositions, and term fees, for suspending, expelling, and otherwise punishing students, so that it shall not extend further than expulsion and retaining term fees, and collecting the amount of any damage done by students to the property of said school; for conferring on students such honors as they may judge proper, having relation to the object of said school as expressed in the said preamble, and for managing and directing all the concerns of said school; also for confirming the constitution and by-laws, or any part thereof heretofore adopted by said trustees, provided such by-laws and regulations have relation to the subjects of the preamble of this act exclusively.

3. *And be it further enacted,* That the officers of said school shall consist of a president, two vice-presidents, a treasurer and secretary, two professors, and such a number of adjunct professors and assistants as the trustees may from time to time appoint or authorize the appointment of, a librarian, monitor and steward. That whenever any vacancy shall happen among the trustees of said school, such vacancy or vacancies may be filled by a quorum of the remaining trustees, so that two trustees shall reside in Albany, two in Troy, two in Lansingburgh, and two in Waterford.

4. *And be it further enacted,* That there shall be one annual meeting of the trustees of said school on the last Wednesday in April, at which meeting four members of the board of trustees shall constitute a quorum, and that four members shall also constitute a quorum at all special meetings, to be called by the president at any time after the passing of this act, provided a written notice of such meeting, signed by the president or by one of the vice-presidents, shall be left at the dwelling-house or place of

residence of such member of the board seven days previous to such special meeting.

5. *And be it further enacted*, That Samuel Blatchford shall be president, and that he, together with all the other officers of the said school, shall remain as heretofore, until a special meeting of a quorum of said trustees shall be assembled at such school, by the president, or by a vice-president, as prescribed in the fourth section of this act or until the annual meeting on the last Wednesday in April next, then to be permitted to continue in their respective offices, or their places to be filled at the pleasure of the trustees.

6. *And be it further enacted*, That the Legislature may at any time modify or repeal this act.\*

Upon the passage of the act of incorporation the trustees named in it held a meeting at the school on April 3, 1826, and, after reappointing all the officers who had been serving at the time the bill was passed, they resolved that the constitution previously adopted, consisting of the two letters of Mr. Van Rensselaer, should continue to be the constitution of the school, with certain amendments. These amendments provided that there should be three terms in each year, to be called the fall term, winter term, and spring term; that the fall term should be an experimental term commencing on the third Wednesday in July and continuing fifteen weeks; that the winter term should be a recitation term commencing on the third Wednesday in

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\* This Act of Incorporation was amended, from time to time, as will be shown later. As amended, to this date, it is given in Appendix VII; and with it is given a résumé of all Acts of the Legislature relating to the Institute.

November and continuing twelve weeks; that the spring term should be an experimental term commencing on the first Wednesday in March and continuing until the last Wednesday in June, and that the last-mentioned day should be the annual commencement.

At the same meeting a code of by-laws consisting of eleven articles was passed. These replaced the fourteen by-laws, passed March 11, 1825, which are referred to in the new code as "having been intended for the temporary government of the school in its incipient state." Some of these articles which embody the curriculum of that day will be given in full.

Article 1. The course of exercise at said school in the Fall Term shall be, as nearly as circumstances will permit, as follows: Each student shall give five lectures each week on systematic botany, demonstrated with specimens, for the first three weeks, and shall either collect, analyze and preserve specimens of plants, or examine the operations of artists and manufacturers at the school workshops, under the direction of a professor or assistant, who shall explain the scientific principles upon which such operations depend, four hours on each of six days in every week, unless excused by a professor on account of the weather, ill-health or other sufficient cause. For the remaining twelve weeks, each student shall give fifteen lectures on mineralogy and zoology, demonstrated with specimens; fifteen lectures on chemical powers and substances not metallic; fifteen lectures on natural philosophy, including astronomy; and fifteen lectures on metalloids, metals, soils, manures, mineral waters, and animal and vegetable matter—all to be fully illustrated with experiments performed with his own hands; and shall examine the operations of artists at the school



workshops, under the direction of a professor or assistant, four hours on every Saturday, unless excused as aforesaid.

Article 2. During the Winter Term students shall recite, to a professor or to a competent assistant, the elements of the sciences taught in the fall and spring terms; and shall study and recite, as auxiliary branches in aid of these sciences, rhetoric, logic, geography, and as much mathematics as the faculty shall deem necessary for studying land surveying, common mensuration, and for performing the common astronomical calculations.

Article 3. The course of exercises in the Spring Term shall be, as nearly as circumstances will admit, as follows: Each student shall, during the first six weeks, give ten lectures on experimental philosophy; ten lectures on chemical powers and on substances not metallic; and ten lectures on metalloids, metals, soils and mineral waters. For the remainder of the term each student shall be exercised in the application of the sciences before enumerated to the analysis of particular selected specimens of soils, manures, animal and vegetable substances, ores, and mineral waters; and shall devote four hours of each day, unless excused by one of the faculty, to the examination of the operations of the agriculturists on the school farms, together with the progress of cultivated grains, grasses, fruit-trees, and other plants, to practical land-surveying and general mensuration, to calculations upon the application of water-power and steam which is made to the various machines in the vicinity of the school, and to an examination of the laws of hydrostatics and hydrodynamics which are exemplified by the locks, canals, aqueducts, and natural waterfalls surrounding the institution.

Article 4 relates to the admission of students. It provides that no candidate shall be admitted as an annual student under the age of seventeen years. The conditions under which examinations are to be held and degrees given are set forth in Article 5.

The degree conferred was bachelor of arts in Rensselaer School, A.B. (r.s.). After the expiration of three years from the receipt of this degree, or of one year, if the student attended a second annual course at the school and proved his capacity, the degree master of arts in Rensselaer School, M.A. (r.s.), was conferred. No degree could be conferred on any one less than eighteen years old; and in using the abbreviation for bachelor or master of arts the letters (r.s.) had to be added. It is provided in Article 6 that, after receiving a degree, a person ever after remained a member of the school, and must, every three years, report his occupation to the trustees. We learn from Article 7 that at this time the tuition was \$15 for each experimental term and \$6 for the recitation term. The student also had to pay extra for breakage and chemicals consumed and his proportion of the cost of fuel and lights and the services of the monitors. Article 8 relates to weekly reports from professors, Article 9 to the times of meeting of the board of trustees, Article 10 makes void all previous rules and by-laws, and Article 11 provides for temporary rules to be made by the faculty.

Much of the information above given in relation to the founding of the school is taken from the original minutes of the meetings held by the board of trustees and from a pamphlet entitled "Constitution and Laws of Rensselaer School in Troy, New York; adopted by the board of trustees April 3, 1826; together with a Catalogue of Officers and Students," which was published in Albany in

1826. Among "Notices and Remarks" found in it, there is a paragraph containing an itemized account of the necessary expenses of a student. This will be quoted to show the difference between the cost of education at that time and the outlay required at the present day:

The expenses for a student of ordinary prudence will be about \$100, if he is absent during the winter term:

Board, 30 weeks at \$1.50.....	\$45.00
Washing, about 18 cents per week.....	5.62
Chemical substances, etc., about.....	4.00
Proportion of fuel and lights, about.....	6.00
Text-books, about .....	4.00
Experimental term fees, \$15.....	30.00

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Total .....\$94.62

The catalogue contains the names of the professors and twenty-five students. Amos Eaton is entitled professor of chemistry and natural philosophy and lecturer on geology, land surveying, etc., and Lewis C. Beck, professor of botany, mineralogy and zoology. Eighteen of the students came from the State of New York, two from New Hampshire, two from Massachusetts, one from Vermont, one from Ohio and one from Pennsylvania. The fact that students were drawn from states, in those days so distant from Troy, is a tribute to the reputation of Eaton, for it will be remembered that this was before the construction of railroads. The Erie Canal had been built, but roads were poor and much of the travelling was done on horseback. Douglass Houghton, of the class of

1829, who came from the western part of New York State, wrote home: "After seven days and nights riding I arrived in Albany almost completely worn out; from that place I came here and presented my credentials on the 14th. The school more than equals my expectations."