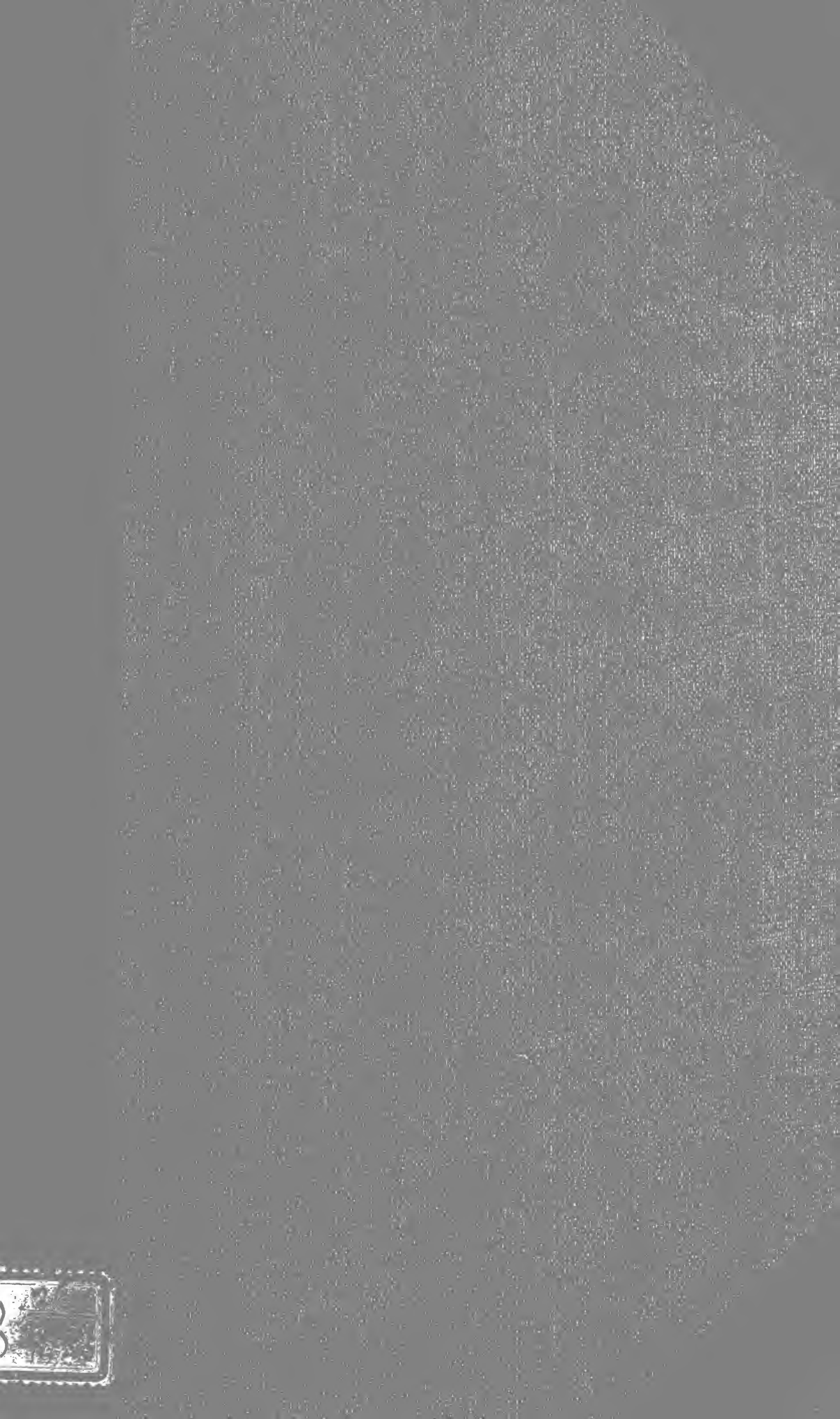

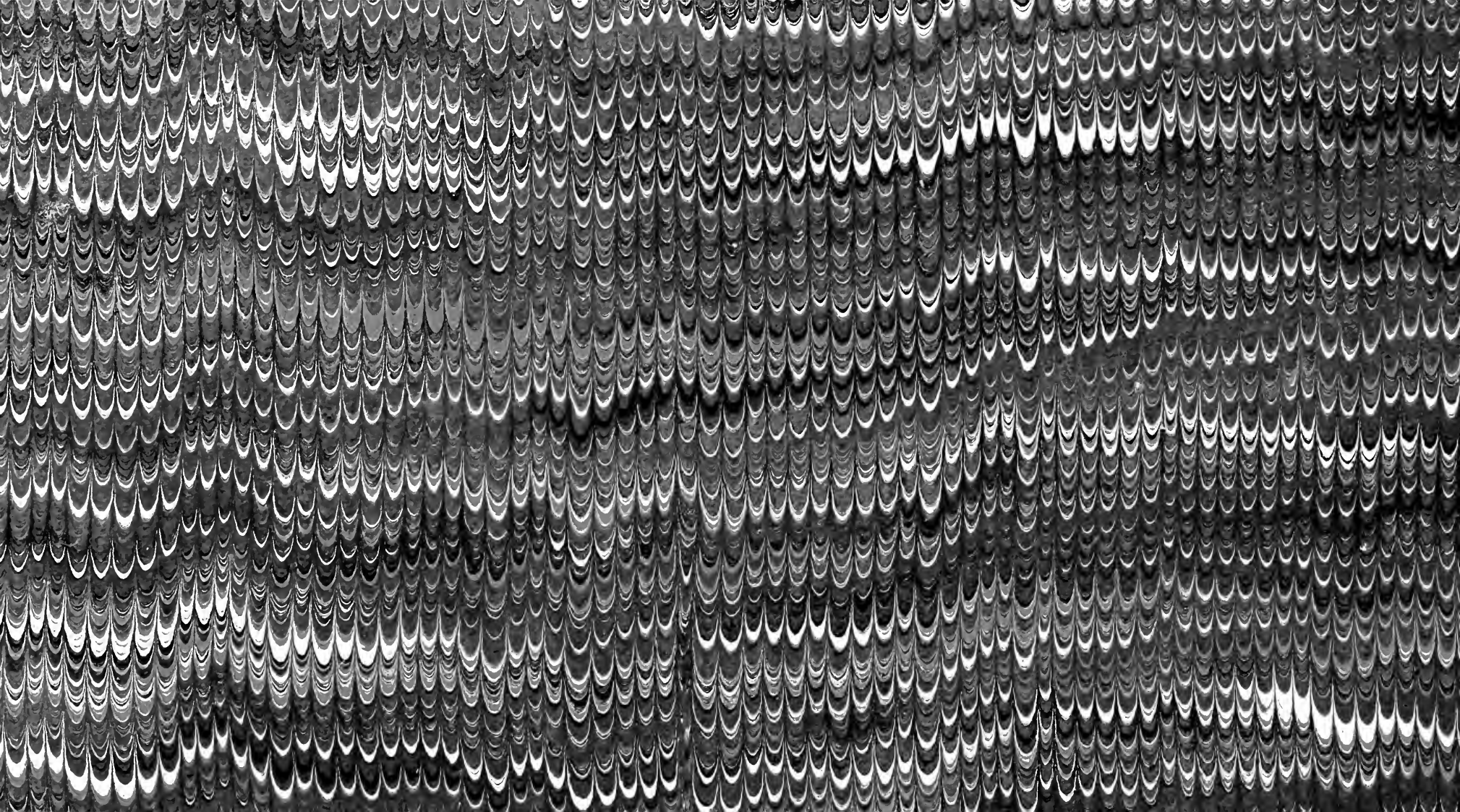

John Boynton

WORCESTER COUNTY

Free Institute of Industrial Science.

ADDRESSES

OF

INAUGURATION AND DEDICATION,

WORCESTER, NOVEMBER 11, 1868.

MEMORIAL NOTICE OF JOHN BOYNTON, Esq.,

Founder of the Institute.

MEMORIAL NOTICE OF HON. ICHABOD WASHBURN,

Founder of the Practical Mechanical Department.

WORCESTER:
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1869.

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TRUSTEES.

HON. STEPHEN SALISBURY, *President.*
HON. D. WALDO LINCOLN, *Secretary.*
DAVID WHITCOMB, ESQ., *Treasurer.*

REV. SETH SWEETSER, D. D.,
HON. GEORGE F. HOAR,
HON. EMORY WASHBURN,
HON. ICHABOD WASHBURN,*
REV. ALONZO HILL, D. D.,
ALPHEUS HARDING, JR., ESQ.,
REV. H. K. PERVEAR,
CHARLES H. MORGAN, ESQ.,
HON. JAMES B. BLAKE.

INSTRUCTORS.

CHARLES O. THOMPSON, *Chemistry.*
GEORGE E. GLADWIN, *Free-Hand and Mechanical Drawing.*
GEORGE I. ALDEN, *Civil and Mechanical Engineering.*
MISS HARRIET GOODRICH, *Elementary Mathematics.*

SUPERINTENDENT OF MACHINE SHOP,

MILTON P. HIGGINS.

* After decease of Hon. Ichabod Washburn, P. L. MOEN, Esq., was elected Trustee.

FOUNDATION.

Letter of Gift and Instructions from John Boynton, Esq., Founder of the Worcester County Free Institute of Industrial Science.

"Being desirous to devote a portion of the property, which, in the good Providence of God has fallen to my lot, for the promotion of the welfare and happiness of my fellow men, I have determined to set apart, and do here set apart, and give the sum of One Hundred Thousand Dollars, for the endowment and perpetual support of a free school, or institute, to be established in the County of Worcester, for the benefit of the youth of that County.

"The aim of this school shall ever be the instruction of youth in those branches of education not usually taught in the public schools, which are essential, and best adapted to train the young for practical life; and especially, that such as are intending to be mechanics, or manufacturers, or farmers, may attain an understanding of the principles of science applicable to their pursuits, which will qualify them in the best manner for an intelligent and successful prosecution of their business; and that such as intend to devote themselves to any of the branches of mercantile business, shall in like manner be instructed in those parts of learning most serviceable to them; and that such as design to become teachers of common schools, or schools of the like character as our common schools, may be in the best manner fitted for their calling; and the various schemes of study and courses of instruction shall always be in accordance with this fundamental design, so as thereby to meet a want which our public schools have hitherto but inadequately supplied.

"And that my design may be the more fully understood, it is hereby enjoined upon those who shall be entrusted with executing this my purpose, that the following studies, or such parts of them as can be profitably pursued, shall always be embraced in the course of instruction—namely: Mathematics, with its simpler application to surveying, leveling, &c.; Physics and Mechanics; Mechanical Engineering; Civil Engineering, including drawing, designing and modeling; Architecture,

as applied to construction of buildings, including value and strength of materials; Chemistry, elementary and practical, as applied to the various arts, and to agriculture; Metallurgy, the composition and working of metals; Geology, with its application to mining and agriculture; Astronomy, with its application to surveying and navigation; Political Economy, including commercial laws and civil polity; Botany and Zoology, as applied to plants and animals used for food, and in the arts; Book-Keeping, Geography, the French Language and the Science of Teaching; together with such other kindred branches as experience may, from time to time, show to be necessary to the better securing of the general purpose.

"And these studies shall be arranged, and instruction given in them, according to the wisdom and discretion of those to whose care this institution is entrusted; it being understood that the course shall include studies with text books and recitations, and lectures with experiments, and all such practical applications of the use of tools and instruments, and the working of machinery, as may be available, so that the benefits of this school shall not be confined to the theories of science, but as far as possible shall extend to that practical application of its principles which will give the greatest advantage in the affairs of life.

"This institute shall be located in the city of Worcester, provided the citizens of Worcester furnish the funds necessary to purchase a lot and erect a suitable building or buildings for its accommodation, so that the same shall be ready for use on or before the first day of May, in the year 1867.*

"The oversight of this institution shall be in a board of twelve trustees, constituted as follows: The Mayor of the city of Worcester, for the time being, shall always be one; one shall be appointed by the Board of Education of the Commonwealth of Massachusetts; three shall be pastors of churches in the city of Worcester, of three different religious denominations, namely: The Orthodox Congregationalist, the Baptist and the Unitarian; the remaining seven shall be laymen of good intelligence and respectability, who shall be elected for their ability to direct the affairs of such a school. And when any vacancy occurs by death or resignation, the place shall be filled by election, in which the choice shall be determined by the major vote of the members of the board of trustees, regard being always had to the above regulations.

"In the appointment of the first board of trustees, the individuals to constitute the board will be selected by myself, with such advice and concurrence of those who co-operate in this design as propriety dictates, and it is expected that their names, in whole or in part, will be contained in the act of incorporation.

"This board shall receive and hold, and securely invest the sum above named, and any and all other funds, of whatsoever kind, may be entrusted to them for the benefit of this school, and they and their suc-

* The time for completing the building was extended.

cessors in trust are solemnly enjoined to fidelity in the care and use of all such funds, and not to suffer the same to be lost, or diminished, and to use the income of the above named fund, and that only, to meet the current expenses of the instruction of the school, exclusive of repairs, or improvement upon the real estate. If at any time there should remain a surplus of the income of the fund for instruction, after defraying the expenses of instruction for the year, the same shall be added to the principal of said fund, and if at any time, from any adequate reason, or unavoidable necessity, instruction should be suspended, all income accruing during such suspension shall in like manner be added to the principal.

"The choice and discharge of teachers, and their salaries, the establishment of rules for the management of the school, the care and repair of buildings, and all oversight necessary to carrying out the designs of this institute, is committed to the trustees, in the exercise of their best judgment and discretion.

"The school shall be opened freely to youth in the county of Worcester, provided that only persons not under fourteen (14) years of age, or over twenty-one (21) years of age shall be admitted, and that from the applicants for its privileges, those only shall be received who pass satisfactorily such an examination as the trustees shall, by their rules, from time to time prescribe; it being understood that the examination is to secure so much previous education as shall be necessary to enter with profit upon the course of study in this school; and that the number of scholars shall be fixed, in their discretion, so as to be in proportion to the reasonable ability of the instructors employed. The trustees, however, shall have authority so far to modify the above regulation in regard to age, as to admit, under circumstances of peculiar exigency, persons over twenty-one years of age to the benefits of the school, if it can be done without detriment to the general interests of the school; and also in special cases, when, in their judgment, there is sufficient reason for doing so, with a like regard to the interests of the school, to admit scholars not belonging to Worcester county, and shall require of them, at their discretion, a moderate sum for tuition. And if, in future time, it shall be found by experience that confining the privileges of the school to males only would be more advantageous to the community, and to the interests of education, the trustees shall have the liberty to make such limitaton, for such periods as shall to them seem best

"Whereas, in making provision for the security of piety and good morals in connection with seminaries of learning, the statutes of the Commonwealth contain the following article. (GEN. STAT., CHAP. 38, SEC. 10,) it is therefore enjoined upon the trustees to see that these provisions are applied faithfully in this school, and that, while all sectarianism and all control of one religious sect over another is strictly prohibited, the Bible, in the authorized version, shall be in daily use, and such devotional exercises as consist with a due sense of our dependence upon the Divine blessing.

"The board of trustees shall be organized by the election, from their own body, of a president, secretary, and treasurer, each to hold office for one year, or till a successor is elected, and each to discharge the duties common in such offices.

"The trustees shall meet at least once in each year for the transaction of business, and otherwise as often as the welfare of the institution may require. The time of the annual meeting and the manner of calling meetings of the trustees shall be fixed in the by-laws herein provided for.

"The trustees shall make and establish by-laws for the direction of the officers of the seminary, and for their guidance in the transactions necessary to carry out the intentions of this instrument.

"The expenses attending the meetings of the board shall be defrayed from the treasury, but no compensation shall, in any event, be given to members of the board for their services.

"The school shall be supplied with suitable apparatus, and a library containing books valuable for reference; and it is my design to establish a supplementary fund, the income of which shall be devoted to meet these and other wants, and contingencies that may arise, according to a method hereafter to be adopted.

"The above named sum of ONE HUNDRED THOUSAND DOLLARS, which has already been given and paid over by me, for the above uses and purposes, will be conveyed and given over to the board of trustees herein established, after they are empowered by act of the Legislature to receive and hold the same, under the instructions and obligations of this instrument; and as soon as the grounds and buildings necessary are ready for use.

"And it is my desire to have it especially considered by the trustees, who are entrusted with the care of this institution, that its design is to give ample and thorough instruction in the several parts of education pursued, so that it may be an advantage to coming generations, a help to industrious and intelligent young persons, and an honor to the community in which it is established; and that those who are trained in it may be useful citizens, not only well versed in the sciences and arts, but also persons of good morals, who will lead upright and honest lives in the sight of God and man."

JOHN BOYNTON. [SEAL.]

Signed and sealed in presence of DAVID WHITCOMB.
May 13, 1865.

At a meeting of the Corporation, June 3, 1865, the foregoing declaration having been submitted to the Corporation, and by them considered, it was unanimously

Voted, "That the same be accepted and adopted as the terms upon which the donation of one hundred thousand dollars is made, and that a substantial compliance therewith be considered the condition upon which said fund is to be held and managed."

It was also *Voted*, "That the Trustees of the Worcester Co. Free Institute of Industrial Science would hereby record their high appreciation of the distinguished liberality of the donor of the fund of one hundred thousand dollars for the establishment and maintenance of said institute, and desire to express to him their belief that he has thereby laid the foundation of an institution which will do honor to his memory, and be a lasting benefit to the country and to coming generations."

CHARTER OF THE CORPORATION.

Commonwealth of Massachusetts.

IN THE YEAR ONE THOUSAND EIGHT HUNDRED AND SIXTY-FIVE.

An Act to Incorporate the Worcester County Free Institute of Industrial Science.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. George F. Hoar, Seth Sweetser, their associates and successors, are hereby made a body corporate by the name of the Worcester County Free Institute of Industrial Science, for the purpose of establishing and maintaining, in the city of Worcester, an institution to aid in the advancement, developement and practical application of science in connection with arts, agriculture, manufactures, mercantile business, and such other kindred branches of practical education as said corporation shall determine, with all the powers and privileges and subject to all the duties and liabilities set forth in all laws which now are or may hereafter be in force and applicable to such corporations. The mayor of the city of Worcester, for the time being, shall, *ex-officio*, be a member of said corporation, and one member shall be appointed by the Board of Education from time to time as a vacancy may occur; and said corporation shall not consist of more than twelve members at any one time.

SECTION 2. Said corporation shall have authority to accept and hold in fee simple or any less estate, any real or personal estate to an amount not exceeding four hundred and fifty thousand dollars, to be devoted exclusively to the purposes aforesaid and in conformity with conditions made by any donor, not inconsistent with this act, expressed by him in writing and recorded in the records of said institution.

SECTION 3. Said corporation may establish separate departments of scientific instruction and pursuit whenever it can be done without inter-

fering with the unity of purpose of said institution or the government and management of the same, may designate and distinguish such departments by specific names, and accept any moneys for the special advancement of said departments; provided, that no moneys shall be applied to any uses not embraced within the general design of said institution as expressed in this act.

House of Representatives, *May* 6, 1865.

Passed to be enacted,

ALEX. H. BULLOCK, *Speaker.*

In Senate, *May* 9. 1865.

Passed to be enacted,

J. E. FIELD, *President.*

May 9, 1865.

Approved,

JOHN A. ANDREW.

Secretary's Department, *Boston*, *May* 10, 1865.

A true copy,

OLIVER WARNER,
Secretary of the Commonwealth.

TRUSTEES.

A By-Law required the number of Trustees should be twelve, and Hon. George F. Hoar, and Rev. Dr. S. Sweetser, of the Orthodox Congregational denomination in Worcester, Hon. Stephen Salisbury, Hon Ichabod Washburn, and David Whitcomb, Esq., Alpheus Harding, Jr., Esq., of Athol, Rev. Dr. Alonzo Hill, a Unitarian clergyman in Worcester, and Rev. Hiram K. Pervear, a Baptist clergyman in Worcester, Hon. Emory Washburn, of Cambridge, elected by the Board of Education. Hon. Phinehas Ball, as Mayor of Worcester. Hon. D. Waldo Lincoln and Charles H. Morgan, Esq., constituted the first Board of Trustees, organized by the choice of Stephen Salisbury, President, David Whitcomb, Treasurer, and Phinehas Ball, Secretary. On the expiration of the official term of Mayor Ball, Hon. D. Waldo Lincoln was elected Secretary, and Hon. James B. Blake, Mayor, was a member of the Board.

LIBRARY AND APPARATUS FUND.

A Second Communication was received from Mr. Boynton, establishing a Library and Apparatus Fund, as follows:

Having, in the instrument in which I gave the sum of one hundred thousand dollars for the establishment of a School of Industrial Science, stated that it was my design, in addition to that fund, the uses and purposes of which were defined in said instrument, to establish another or a secondary fund, the conditions of which should afterwards be fixed, which said instrument was afterwards modified by extending the time originally provided for the completion of said buildings; and having, in another instrument signed by me on the 20th day of July, 1865, authorized and requested David Whitcomb, of Worcester, to receive and hold all the interest and income of the first mentioned fund accruing after the first of May, in the year 1865, and from that time onward until the buildings to be provided for the use of said school, now called the "Worcester County Free Institute of Industrial Science," should be ready for occupancy, I do now declare my purpose in regard to the said interest and income to be as follows, namely:

That the entire amount, after the payment of such taxes as may have been assessed thereupon, and, after defraying such necessary expenses as may have occurred in the care and management of said fund, shall be paid to the trustees of said institute, who shall receive, hold, and safely invest the same, to be kept as a separate fund, the principal of which under no circumstances to be expended by them or their successors, but shall constitute a fund to be called the Library and Apparatus Fund, the income of which, under the direction of said trustees, shall be used for the purpose of purchasing books and apparatus for the said institute, repairing and supplying deficiences, as the condition of the library and apparatus may require, and so that by the judicious application of the said income from year to year, both the library and the apparatus may be enlarged, and the greatest advantage secured through them to the several departments of instruction in said institute. While this is understood to be chief and the ever prominent use of the fund, I give to the trustees of said institute the liberty, when emergencies occur in which the interest of the institute would be pro-

moted by using the said income in defraying contingent expenses not including therein the cost of instruction, general repairs of the buildings, or improvements, to appropriate any part of the same according to their discretion.

As in the growth and progress of the institute, the said fund may prove inadequate for the above specified necessities, it is my desire, if the trustees concur with me in my judgment, that efforts should be made by them to increase the amount of the fund, provided the additons made to it shall be subject to the above specified conditions, otherwise that the fund remain separate.

Signed JOHN BOYNTON. [SEAL.]

And Sealed this third day of May, in the year 1866, in presence of E. H. WHITCOMB.

Ichabod Hoeshburn

MECHANICAL DEPARTMENT.

Letter of Gift and Instructions from Hon. Ichabod Washburn, to Establish the Machine Shop and Working Mechanical Department of the Institute.

To the Trustees of the Free School of Industrial Science:

Gentlemen—I have long been satisfied that a course of instruction might be adopted in the education of apprentices to mechanical employments, whereby moral and intellectual training might be united with the processes by which the arts of mechanism, as well as skill in the use and adaptation of tools and machinery are taught, so as to elevate our mechanics as a class in the scale of intelligence and influence, and add to their personal independence and happiness, while it renders them better and more useful citizens, and so more like our Divine Master, whose youth combined the conversations of the learned with the duties of a mechanic's son, and whose ideas and teachings now underlie the civilization of the world.

It has seemed to me that the establishment of an Industrial Institute, such as it is proposed to found in Worcester, offers a favorable opportunity for attempting to accomplish this purpose, by a measure which will be sure to be in harmony with the design and operations of such an institution. Impressed with this thought, I have concluded to propose to you a scheme, which, if it meets your approbation, may become a department of such institute, under the general charge and management of its trustees and officers, with such proper limitations and subject to such rules and conditions as may be proposed on my part, and assented to on theirs, to be varied and modified hereafter as occasion may require, by the mutual consent and agreement of the trustees and myself.

The scheme is substantially this, viz:—There shall be a machine shop of sufficient capacity to employ twenty or more apprentices, with a suitable number of practical teachers and workmen in the shop to instruct such apprentices, and provided with all necessary steam power, engines, tools, apparatus, and machinery of the most approved models

and styles in use, to carry on the business of such machine shop in all its parts as a practical working establishment. There shall be a superintendent of such shop, who shall be appointed and subject to be removed by the trustees, who shall be a man of good morals and christian character, having a good English education, a skillful and experienced mechanic, well informed and capable of teaching others in the various parts and processes of practical mechanism usually applied or made use of in the machine shops of the country, who shall devote his time and attention to the management and business of the shop, purchasing stock, making contracts for the manufacture and sale of machines, and other work usually done in machine shops, subject to such rules as the trustees may prescribe, and having charge of the proper financial concerns of the shop, hiring necessary workmen, and discharging the same at his discretion, and who shall see that the apprentices are suitably taught in all the departments of practical mechanism, working of wood and metals, and use of tools, so as to make them so far as may be, skillful workmen, and fitted to carry on business for themselves, after they leave the shop at the expiration of their apprenticeship.

He shall, moreover, have a care and oversight over the apprentices, such as a faithful master would exercise, to the end that they may cultivate habits of industry, good conduct, and attention to their studies, and observe all reasonable rules of discipline, and moral training. He shall receive a respectable salary, and shall be consulted at all reasonable times by the principal and trustees of the institute in respect to the instruction and management of said apprentices, as members of the institute. He shall have the charge of admitting or dismissing the apprentices; but no apprentice shall be admitted or dismissed without the approbation of the trustees, or such committee or officers of their number, or of the institute, as they may prescribe.

There may be admitted, as apprentices in said shop, not less than eight young men of good moral character, if so many offer to become such apprentices, who shall enter into a solemn and satisfactory obligation to become such apprentices for the time prescribed, as hereafter provided, unless sooner discharged, and shall in all things conduct themselves agreeably to the rules and regulations of the shop, devoting their time and efforts to becoming educated, skillful, intelligent mechanics, and good and useful citizens.

Should more young men apply for admission than the shop will accommodate at any time, those shall be selected, if otherwise properly qualified, who are inhabitants of the county of Worcester, least able to be supported by themselves, or their parents or friends, as it is my purpose, so far as the same can be consistently done, to make this a generous charity to poor and deserving young men, in aiding them to start in life. And to this end it is my intention and desire that there should be a careful and accurate account kept of the business of the shop from year to year, and if there shall have been a net profit made during such year, not including in the expense thereof the salary of the

superintendent, nor the interest upon the investment in buildings, in machinery, &c., nor the repairs upon the buildings or motive power of the establishment; such net profit, together with so much of the income of the fund of fifty thousand dollars, hereinafter provided for, as may be necessary therefor, shall be apportioned by the trustees, in connection with the superintendent, in supporting at least eight of the most meritorious and deserving of the apprentices for the time being, or if, in the judgment of the said trustees it shall be thought best to distribute the amount necessary to the entire support of eight of said apprentices among sixteen of their number, the same may be expended accordingly, by supplying clothing, board, or other things of which they may be in need, the amount and the several proportions thereof to each to depend upon what may be needed of such net profits and income, and what, in the judgment of the trustees and superintendent, may be a fair and equitable distribution thereof, having regard to the condition of the apprentice, as well as his progress in his education, as it is my earnest desire, and an imperative condition of this, my gift, that the apprentices shall be as thoroughly instructed in the principles of science as may be reasonably accomplished during the period of their residence at the institute; and also that they shall acquire a practical knowledge of the use of tools and work, to such an extent as shall be of substantial advantage; and, as for the attainment of both these aims it is necessary that the time required for work in the shop shall not be encroached upon by attention to study, nor the time, on the other hand, required for study be injuriously restricted by attention to work, I give it as my judgment that the time of work should not in the average be more than four hours per day during the days of the regular sessions of the institute; it being understood that I do not bind the trustees to adhere to this exact amount or division of time, knowing the impossibility for providing for contingencies in the future, but that the times here indicated are to be taken as a general guide in carrying out my purposes, confiding the most favorable practical adjustment of the same to their experience and fidelity.

And I do most strictly enjoin it upon the board of visitors hereafter constituted, as a chief and most important part of their duty, to see that there is no neglect in securing the two-fold purpose of this foundation simultaneously, namely: education in the shop in the practical training therein given, and education in the school, by recitations, lectures, and whatever other modes may be therein adopted. In furtherance of the above stated object, the apprentices shall attend to work in the machine shop at such hours in the day as shall be required by the rules adopted or approved by the trustees, and it is expected of them to be industrious, and use their best endeavors to acquire knowledge and skill in the various kinds of work in which they are instructed. They shall also attend such classes in the institute as the principal and teachers thereof, together with the superintendent, shall judge best, at such time of the day as shall be regulated and prescribed by such superin-

tendent, principal and trustees, and while there shall study and apply themselves to such books and exercises as may be prescribed for them, and shall faithfully endeavor to improve their time and opportunity in acquiring useful learning and knowledge; and it is to be understood that their hours in the shop and the school shall be so arranged as not to interfere unfavorably with their progress in either branch of their education.

It shall be the duty of the trustees, from time to time, to adopt or approve such rules, in accordance with the above provision, as they shall think proper in regard to the hours of work and school instruction in which the apprentices shall be employed, and as to attending the lectures in the institute, or sharing any other of its privileges and advantages, so as best to promote the advancement of those young men in acquiring a trade, and at the same time the elements of useful science and good learning.

To carry out the foregoing plan, and to enable the trustees to sustain the measure hereafter in all its parts, I propose and offer to them to erect at my own expense, not to exceed twelve thousand dollars, a suitable machine shop in some suitable and convenient place near the institute, and to provide for the same a good and sufficient steam engine of at least the power of ten horses, with other suitable tools, engines, apparatus and machinery necessary to fit such machine shop for use and occupation. I furthermore propose and offer to furnish for the first year's working cash capital, the sum of $5000; after that and during my lifetime the income and interest of fifty thousand dollars annually, to be applied by the trustees in supporting and carrying on said machine shop in the manner herein before expressed, and paying the necessary expenses, and in supplying it with stock and materials for the first set of machines, of whatever kind or kinds it may be, which may be to be manufactured, supposing that thereafter the proceeds of the sales of any manufactured machines will at least supply the means of purchasing stock and material for a second one, and so on as the business may progress, without charging the same to the general fund of the department. I further propose and offer that I will, by my last will and testament, make provision whereby my estate, after my decease, shall pay to said trustees the sum of fifty thousand dollars, to be kept safely invested, separate and distinct from the general fund of the institute, as a perpetual and entire fund for this department, the income of which shall be faithfully applied in carrying out the plan and scheme hereinabove described, including provision for fund to be set aside and reserved to cover risk of fire, depreciation, and losses from any cause, and in an earnest and honest endeavor to give success to the same, according to the views and purposes which I have above expressed.

I further direct and require that out of the net annual proceeds of the income of said fund of fifty thousand dollars, and of the income of the machine shop, after meeting and defraying the current charges and expenses properly chargeable thereto, there shall be set apart the sum of

ten thousand dollars, to be raised and accumulated as soon as may be consistently with the successful management of the institution, which shall be safely invested and retained as a reserve fund, the income of which may be expended, from time to time, in defraying the contingent charges and expenses of said shop, and the management of the same, and if anything remains, to the general purposes of the institute; and the principal thereof may be borrowed and used by said trustees to meet extraordinary emergencies, when from any cause the income of said fifty thousand dollars, and of the shop, shall be inadequate to meet the necessary current expenses of said machine shop and the management thereof; the sum so borrowed to be repaid and restored to said fund, so as to keep the same good, as soon as the condition of the fund and shop shall admit of so doing. And if, after carrying out these views, keeping the machine shop, engines, tools and appurtenances in good condition and repair, and rendering such aid to indigent young men as above contemplated, there shall be any surplus of income remaining from said fund, at any time, the same may be applied, from time to time, to the general purposes of the institute, unless needed for the enlargement and extending of accommodation for the department of the shop.

This offer and proposition is made upon the express understanding that if, after a fair and reasonable experiment made, the trustees shall be satisfied, that the plan proposed cannot be successfully and advantageously carried out, and shall see fit to abandon the same, they may do so, and the entire fund of fifty thousand dollars, together with all the property connected with the machine shop, shall thereafter constitute a fund, the income of which shall be used by said trustees for the promotion of the main design of the institute, and more especially if, in their judgment, it will better subserve the interests of the institute, the income of said fund shall be appropriated to the department of mechanical engineering, or to some branch thereof, and the same shall be held in trust by them, and faithfully kept and used to carry out my desire of extending the benefits of education as declared in this instrument, and subject to the inspection of the board of visitors hereinafter provided for. And, moreover, if the above change should, under any circumstances, be carried into effect, it shall not be allowed to prevent, curtail, or in anywise interfere with my purpose to unite a generous charity with the disposition of these funds, but a portion of the income shall always be given towards aiding indigent and deserving young mechanics in pursuing their studies, to the same extent and to the same number of persons as before designated, with only such modifications as necessarily arise from this alteration in the use of these funds.

But in order that my first design and plan may not be abandoned without a fair and impartial trial, I further stipulate, if it shall appear to the board of visitors, hereinafter named, or if they shall have any cause or ground to believe or suspect, upon the abandoning of the above plan, that there has been any negligence, deficiency of interest

or unfaithfulness on the part of said trustees in the experiment, that the board of visitors shall proceed to investigate the course of management of the trustees, to the end that they may fully understand the grounds and reasons which have led the trustees to declare the experiment unsuccessful and the further prosecution of it inexpedient; and if they are not satisfied with the management of the trustees as faithful and impartial, they shall proceed forthwith to a settlement of the question, in the following manner, namely:—They shall cause a committee to be constituted by the choice of two individuals of their own selection, and two selected by the trustees, which four persons shall elect a fifth, who shall be chairman of the committee; all these persons being men of known probity, intelligence and good standing, and said committee shall examine into all the proceedings of the trustees in the premises, so as to render a fair and impartial judgment, and if they shall determine the views of the trustees to be correct, and their acts conformable to the just requirements of this instrument, then the board of visitors shall sanction the transfer of the above named funds as herein directed.

But, if the said committee shall find that mismanagement, negligence or want of interest, or any defect in administration has led to the abandonment of my plan, they shall declare the said trustees to have forfeited the said funds, and the board of visitors shall see that the trustees do thereupon refund and pay over to my personal representatives, to be disposed of by my will, or according to law, the principal fund aforesaid, and give up all claim to the real or personal property of the machine shop, unless the same shall be erected on the land of the trustees, in which case my heirs or personal representatives, or devisees, as the case may be, may remove the buildings, engines and tools, and dispose of the same as a part of my estate.

And to the end that there shall always be a body of men, distinct from said trustees, who shall be authorized to exercise a visitorial power over the administration of said fund, and the management of said mechanical department, and expose any violation of, or departure from the provisions of this donation herein expressed, I authorize and request the persons hereinafter mentioned to act as visitors, and at all reasonable times, when they shall have cause to suspect and believe that said fund is or has been misapplied, or the machine shop and its departments neglected or improperly conducted, they are to examine into the same, and take such action as they may be advised is necessary to correct and remedy such misappropriation, neglect, or mismanagement, viz: the Judge of Probate for the county of Worcester for the time being, the clerk of the Supreme Judicial Court for said county for the time being, and the Chairman of the County Commissioners for said county for the time being, or whoever may fill the office corresponding to that now called by that name. And all reasonable and necessary expenses, occasioned by the exercise of the power aforesaid, shall be paid out of the income of the fund aforesaid; and

the trustees are to hold said shop and fund aforesaid, subject to the proper and reasonable exercise of said visitorial power by the persons aforesaid; it being understood that said visitors are not to be empowered to overrule in any particular the discretion of the corporation in the control or application of the funds, or regulation of the affairs of the department, but they may institute proper judicial proceedings in the courts of the Commonwealth, in case they deem it necessary.

The number of apprentices beyond the number herein prescribed, to be admitted into the shop, the age at which the same may be admitted, and the length of their apprenticeship, shall be prescribed from time to time by the trustees, according to the condition and circumstances of the institute, and business of the machine shop.

ICHABOD WASHBURN. [SEAL.]

Signed and sealed in presence of RUFUS W. SACKET, J. Q. ADAMS, GEO. H. KENDALL.

Worcester, March 6, 1866.

At a meeting of the trustees at the above date, it was

Resolved, That the trustees accept with gratitude the proposition now made, and agree to the change and modification of that originally made, as contained therein.

Mr. Washburn's first offer, to establish a Machine Shop, was made Dec. 2, 1865, and was accepted by the Trustees in the following Resolutions:

"*Resolved*, That the trustees of the Worcester County Free Institute of Industrial Science have received with unmingled satisfaction the proposition, this day made to them by their respected associate, the Hon. Ichabod Washburn, in the communication which has been just read, to contribute the means of erecting and maintaining a Machine Shop, to be applied in the practical instruction of youth in the mechanic arts, in connection with the branches of education taught in the institute. They gratefully accept the proposition of the donor, and pledge the trustees and their successors to carry out his intentions, as expressed in said communication, in good faith, so far as the same can reasonably be done. In accepting this, the trustees desire to express their high appreciation of the distinguished liberality and the wise benevolence and public spirit which prompted this contribution to the cause of popular education. They congratulate the people of the County of Worcester that an institution for the education and elevation of all classes has been planted in this county with the encouragement it offers to the young to a life of honorable industry; that such an institution should have been founded from the fruits of such lives on the part of two of their fellow citizens, who have thereby reared a monument to their public spirit as lasting as the interests of learning and a common humanity."

WORCESTER BUILDING FUND.

DONATIONS FROM CITIZENS, NOW OR RECENTLY DOING BUSINESS IN THE CITY OF WORCESTER, FOR BUILDINGS AND IMPROVEMENT OF GROUNDS.

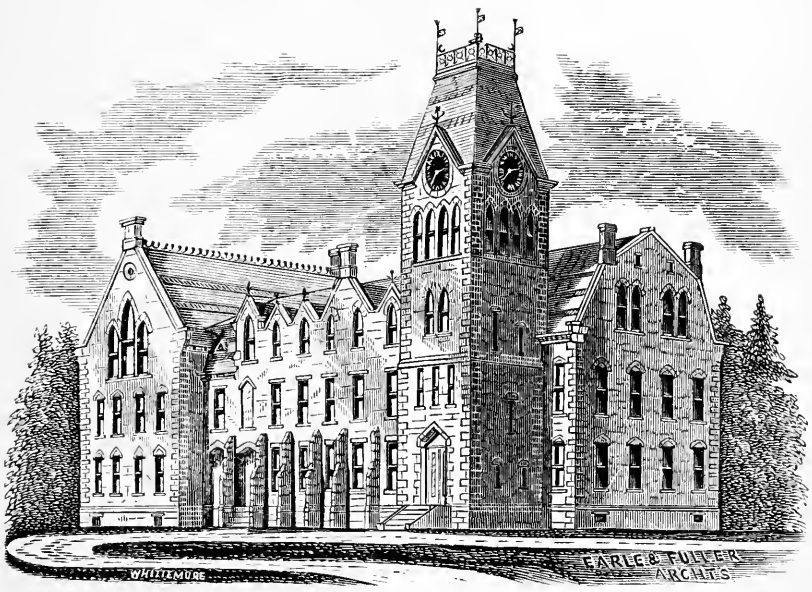
Stephen Salisbury,	$22,000	Willard Brown,	$200
James White,	1,700	W. A. S. Smyth & Bro.,	200
T. K. Earle & Co.,	1,500	Geo. M. Rice,	200
David Whitcomb,	1,200	Dr. Wm. Workman,	200
Lucius W. Pond,	1,100	Geo. F. Hoar,	200
P. L. Moen,	1,100	Geo. W. Russell,	200
H. B. Claflin of New York,	1,000	W. E. Rice,	200
Dr. John Green,	1,000	Barnard, Sumner & Co.,	200
Isaac Davis,	1,000	Earle & Fuller,	200
Benj. Butman,	1,000	F. H. Dewey,	150
Levi Lincoln,	1,000	W. McFarland,	150
Ichabod Washburn,	1,000	J. H. & G. M. Walker,	150
Chas. W. Smith,	1,000	Oakes Ames, Boston,	100
Wm. A. Wheeler,	750	Abram Firth,	100
E. A. Goodnow,	700	Sumner Pratt,	100
Albert Curtis,	500	Geo. W. Richardson,	100
T. W. Wellington,	500	W. T. Merrifield,	100
Ethan Allen,	500	Geo. S. Howe,	100
J. M. C. Armsby,	500	Thos. Smith & Co.,	100
Ivers Phillips,	500	Edwin Morse,	100
L. & A. G. Coes,	500	Henry W. Miller,	100
Geo. W. Gill,	500	Towne & Harrington,	100
Geo. T. Rice,	500	Edward L. Davis,	100
F. H. Kinnicutt.	500	Dwight Foster,	100
Alexander H. Bullock,	500	Draper Ruggles,	100
C. W. Freeland & Co.,	500	Martin Lathe,	100
Geo. Crompton,	500	Chas. Baker & Co.,	100
Sewell H. Bowker,	500	Albert Tolman,	100
H. H. Chamberlin,	500	Geo. Phelps,	100
Joseph Pratt,	400	Geo. T. Murdock,	100
Richard Ball,	400	A. P. Richardson,	100
Henry Goddard,	300	Stephen Taft & Son,	100
E. C. Cleveland & Co.,	300	F. H. Inman,	100
Dr. George Chandler,	300	Richardson, Merriam & Co.,	100
E. G. Partridge,	300	Mrs. John Davis,	100
R. C. Taylor,	300	D. S. Goddard,	100
C. B. Pratt,	250	Timothy S. Stone,	100
Merrick Bemis,	250	John Barnard,	100
F. W. Paine,	200	Geo. S. Barton,	100
L. M. Larned,	200	W. W. Rice,	100
Mowry Lapham,	200	Jonas Heald,	100
Stephen Salisbury, Jr.,	200	Augustus Flagg of Boston,	100
Bigelow & Barber,	200	Edwin Conant,	100
C. S. Messinger,	200	W. H. Jourdan,	100

Ira M. Barton,	$100
Adin Thayer,	100
Warren Williams,	100
Harrison Bliss,	100
P. Emory Aldrich,	100
John D. Baldwin,	100
E. Harrington,	100
John Gates,	100
Samuel Woodward,	100
Dr. Benj. Heywood,	100
Dr. T. H. Gage,	100
Alonzo Whitcomb,	100
C. H. Ballard,	100
D. Waldo Lincoln,	100
D. S. Messinger,	100
Wm. H. Harrington,	100
Calvin Foster,	100
H. N. Tower,	100
Carter Whitcomb,	100
R. L. Hawes,	100
Samuel Perry,	75
C. Darling,	75
S. C. & S. Winslow,	75
Daniel Tainter,	70
Samuel Parker,	50
Rufus Carter,	50
A. H. Wilder,	50
R. Wesson, Jr.,	50
T. M. Rogers,	50
J. P. Marble,	50
Russ & Eddy,	50
H. L. Stone,	50
N. A. Lombard,	50
A. H. Hapgood,	50
James B. Blake,	50
John Hammond,	50
S. H. Colton,	50
Benj. Goddard,	50
Kendall & McClennan,	50
Wm. Brown,	50
Stephen Sawyer,	50
Jenkins, Hamilton & Co.,	50
Phinehas Ball,	50
Franklin Whipple,	50
A. P. Ware.	50
A. M. Howe,	50
C. H. Morgan,	50
Graton & Knight,	50
J. S. Pinkham,	50
John S. Baldwin,	50
Edward Bemis,	50
D. H. Eames,	50
Walter Bigelow,	50
J. M. Colbath,	50
Simeon Clapp,	50
Horace Sheldon,	50
John Boyden,	50
Appleton Walker,	50
Geo. A. Kimball,	50
Appleton Dadmun,	50
Dr. Jos. Sargent,	50
Henry Chapin,	50
Earl Warner,	50
W. C. Smith,	50
J. J. Coburn,	50
N. T. Bemis,	25
J. P. Kettell,	25
L. Lewisson,	25
A. Wyman,	$25
Benj. Walker,	25
J. S. Hill,	25
Gross & Strauss,	25
F. Willard,	25
A. S. Brown,	25
S. Mawhinney,	25
Levi Hardy,	25
R. A. M. Johnson,	25
D. A. Hawkins, Jr.,	25
Chas. Wood,	25
F. Harrington,	25
S. Taylor, Jr.,	25
Edwin Draper,	25
H. Walbridge,	25
J. W. Upham,	25
C. A. Wheeler,	25
Jerome Marble,	25
Orrin Wood,	25
Dr. Hobart,	25
W. H. Dexter,	25
Wm. L. Clark,	25
E. A. Fawcett,	25
Geo. R. Spurr,	25
T. W. Hammond,	25
W. Jones,	25
Joseph Tenney,	25
S. C. Andrews,	25
T. L. Nelson,	25
Joseph Boyden,	25
E. A. Howard,	25
Luther Ross,	25
H. Forbes,	25
C. A. Chase,	25
L. Coburn,	25
J. C. French,	25
Rev. Alonzo Hill,	25
Edwin Bynner,	25
F. A. Clapp,	25
E. W. Vaill,	25
Hamilton Holt,	25
Geo. R. Peckham,	25
J. S. C. Knowlton,	25
John D. Chollar,	25
Lovell Baker,	25
Scotto Berry,	25
Joseph S. Perry,	25
E. P. Marble,	25
H. W. Eddy,	25
Benj. Rugg,	25
Samuel Clark,	25
Chas. Stevens,	25
Wm. Cross,	25
D. H. Whittemore,	25
Sylvanus Pratt,	20
W. E. Starr,	20
J. M. Earle,	20
Theo. Brown,	20
Geo. Sessions,	20
John C. Newton,	20
A. N. Currier,	20
F. H. Rice,	20
T. H. Reed,	10
C. H. Gilbert,	10
S. C. Earle,	10
L. Houghton,	10
W. S. Denny,	10
L. Russell,	10

A. H. Hammond,	$10	A. Stocking,	$10
W. G. Strong,	10	F. P. Oliver,	10
D. H. O'Neil,	10	J. L. Morse,	10
A. W. Ward,	10		

WORKMEN IN VARIOUS FACTORIES AND SHOPS.

O. Blood & Sons, Carriage Makers,	$241
E. C. Cleveland & Co., Machine Shop,	135
W. A. S. Smyth & Bro., Boot Factory,	129
T. K. Earle & Co., Card Factory,	120
Washburn Iron Co., Rolling Mill,	100
L. W. Pond, Machinists' Tools,	95
Geo. Crompton, Loom Works,	88
J. H. & G. M. Walker, Boot Factory,	77
Bradley's Car Mfg. Co.,	75
Rice, Barton & Co., Calico Machinery,	70
Bay State Shoe and Leather Co.,	60
Washburn & Moen Mfg. Co., Wire, &c.,	56
Lathe & Morse, Machinists' Tools,	55
Houghton & Heywood, Boot Factory,	51
Daniel Tainter, Woolen Machinery,	45
Wm. A. Wheeler, Iron Foundry,	40
Worcester & Nashua R. R. Repair Shop,	37
Timothy S. Stone & Co., Boot Factory,	36
Ethan Allen, Factory of Fire Arms,	28
Taylor & Farley, Organ &c. Factory,	13
Total donations,	$61,111



BOYNTON HALL.

WORCESTER COUNTY FREE INSTITUTE OF INDUSTRIAL SCIENCE,

Worcester, Mass.

SALISBURY FUND FOR INSTRUCTION.

THIS FUND OF SIXTY THOUSAND DOLLARS WAS MADE BY PAYMENTS IN CONNECTION WITH THE TWO FOLLOWING LETTERS.

WORCESTER, NOV. 28, 1866.

DAVID WHITCOMB, ESQ., *Treasurer of Worcester County Free Institute of Industrial Science.*

MY DEAR SIR:—I enclose my check for ten thousand dollars (10,000), which I give to the Worcester County Free Institute of Industrial Science, in trust, as a fund for the expenses of instruction in said institute. Said fund is to be separately, safely and productively invested and the income thereof is to be applied and expended—first, to maintain said fund at the value of ten thousand dollars, and second, to pay for instruction provided by said institute, and third, any balance of income not needed for the first and second uses above indicated, may be expended for books or apparatus in aid of said instruction.

I am, very respectfully yours.

STEPHEN SALISBURY.

WORCESTER, OCT. 11, 1867.

HON. D. WALDO LINCOLN, *Secretary of the Worcester County Free Institute of Industrial Science.*

DEAR SIR:—The change in the value of money has so impaired the efficiency of the fund, which John Boynton, Esq., most generously gave as the foundation of this Institute, that our citizens cannot have that confidence in the financial strength of the enterprise, which is needed to invite assistance and co-operation, and to insure success. To remove this difficulty, in some degree, and to encourage contributions from others, which will hereafter be desirable and necessary, I offer to the Worcester County Free Institute of Industrial Science, *fifty thousand*

dollars, to be held in trust for the following uses, and for no other, viz: in trust to invest said sum safely and productively as a separate fund, and to expend in maintaining said fund at the full value of $50,000, so much of the income thereof as may be requisite, and to expend the residue of the income in paying the expenses of the instruction, which this institute is established to provide.

Very respectfully and truly yours,

STEPHEN SALISBURY.

FUNDS FOR APPARATUS, BOOKS, &C.

In addition to $26,169, income from Mr. Boynton's donation of $100,000 to the date of the opening of the school, and by his direction reserved as a fund to produce income for apparatus, &c., for the school, donations have been received to be expended for apparatus, &c., from

Estate of Dea. E. W. Fletcher, of Whitinsville,	$500
William Knowlton, Esq., of Upton,	1000

MEMORIAL NOTICE OF JOHN BOYNTON, ESQ.

Offered by the President and Adopted by the Trustees at the Aunual Meeting, held June 5, 1867.

The death of John Boynton, Esq., the worthy and respected founder of the Worcester County Free Institute of Industrial Science, on the 25th of March last, is an event which demands a brief memoir on our records. Mr. Boynton was born in Mason, N. H., on the 31st of May, 1791. He worked as a farmer with his father until near the year 1821. Then he began, in New Ipswich, the manufacture and sale of tin ware, and in a short time he removed to Templeton, where he remained till he retired from active business in 1846. He was a representative of the town of Templeton in the State Legislature, but declined other public offices. After he disposed of his business in Templeton, he resided in Athol, where he was the first president of the Miller's River Bank, in that town. He was twice married, and had no children, and was a widower at the time of his death. He died unexpectedly and suddenly, at Templeton, after an attack of inflammation on the lungs, occasioned by the exposure of a ride in a severe storm.

He had little school instruction and no literary taste. He directed his powers less to intellectual culture than to the business by which he sought to acquire wealth. He was modest and reserved in his disposition, and quiet and orderly in his habits, and he had a reputation for carefulness and moderate thrift rather than for large acquisitions or a philanthropic spirit. He was regarded as an honest, unambitious man, whose thoughts and care did not reach beyond his private affairs and his personal comforts. His love of concealment was injurious to his acts of individual kindness and his general popularity. This disposition was gratified in hiding in his own breast the benevolent enterprise to which he intended to devote the largest part of his property during his life. It was therefore a subject of general surprise and admiration when his reluctance to make display could no longer conceal the fact that this severe economist had acquired so large power of public beneficence, and that he had generously parted with it during his life, to provide for young men the advantages of scientific and skillful training in

mechanic arts, and in other departments of active business which he himself had not enjoyed, and he had not been thought capable of appreciating. It is unnecessary to repeat here that he was most liberal and accommodating in adopting modifications of his original instructions, by which the objects of this institute could be more fully presented.

He made no provision and no suggestion for his personal advantage or distinction, or for the honor of his name. No grain of selfishness tarnished the beauty of his noble benefaction. After giving to his relatives such donations as he judged proper and sufficient, he transferred to this Institute one hundred thousand dollars, carefully invested, for the purposes set forth in his letter of gift. And he reserved for himself a small amount of property, sufficient for his frugal habits and simple tastes in the residue of his life. Several years ago he gave, in his peculiar, quiet manner, ten thousand dollars for public schools in Mason, N. H., where he was born.

While he lived it was proper to respect his wishes as to any personal distinction in connection with his gifts. Now that the Providence of God has withdrawn him from participation in the labors and feelings of this life, these trustees have a duty to preserve his memory for honor and gratitude. The following resolution is therefore adopted:

Resolved, That the principal building for instruction of the Worcester County Free Institute of Industrial Science shall be designated and called BOYNTON HALL, to perpetuate the honored name of the founder of the institute, and to enlarge the good influences of his wise and liberal benefaction.

INAUGURATION AND DEDICATION.

On the 11th day of November, A. D. 1868, at 10 A. M., the Trustees of the Worcester County Free Institute of Industrial Science, their invited guests, the subscribers to the building fund and other friends of the Institute, ladies and gentlemen, assembled, in the face of a driving storm, for inauguration and dedication services at Boynton Hall, in Worcester, in sufficient numbers to fill the chapel. The exercises were commenced by excellent music, volunteered by a quartett choir, under the direction of Mr. B. D. Allen.

Hon. D. Waldo Lincoln, Chairman of the Building Committee of the Trustees, made the following report:

Mr. President and Gentlemen of the Board of Trustees:

On the second day of November, 1866, a little more than two years ago, your committee, consisting of Messrs. Lincoln, Whitcomb, Hoar, and Morgan, was appointed, with instructions to advertise for proposals, to make the necessary contracts, and to superintend the erection of this building. Its location, upon this beautiful and commanding eminence, embracing an area of about eight acres, [the generous gift of our president], had been previously determined by the trustees. The value of this donation cannot be estimated at a less sum than $10,000. The grading of the lot had also been accomplished, and the serpentine road up and around the hill has been constructed, in conformity with the plan of Mr. Calvert Vaux, of New York, an accomplished architect and landscape gardener, and at a cost, including the excavation of the cellar, of $8000. Fifteen thousand yards of earth were removed in the heavy grading that was required to prepare a level plateau of sufficient area to accommodate the proposed buildings.

Objection has sometimes been made to the character and direction of the main approach to the buildings, but in no other manner could the road have been formed. To reach the summit of the hill from Boynton street, it is necessary to overcome an elevation of sixty feet, and it is only by artificially lengthening the line of the road, that an easy and practicable grade could be obtained. The general plan, the style and materials of the building, and its position with reference to the machine shop of Mr. Washburn, had also been decided by the trustees.

The building fund, amounting, with premiums, accumulated interest, and all contributions to the present time, to the sum of $70,987, was placed at our disposal. This sum has been principally raised from the voluntary contributions of citizens of Worcester, stimulated largely by the untiring and persuasive offorts of our former townsman, Abram Firth, Esq. One individual, whose name I need not mention in this presence,* contributed the princely donation of $22,000 to the building fund alone, in addition to the land upon which these buildings stand, and the sum of $60,000 as an endowment fund for the support of the institution. Fifteen hundred and fifty-one dollars were contributed by the workmen in twenty of our shops and factories—a donation doubly welcome, as furnishing evidence of their appreciation of an enterprise, intended to promote their special interests, and to give character and dignity to their calling. Few indeed, were those, having an interest in the honor and prosperity of our city, who withheld the word of encouragement, or declined to render more substantial aid to the undertaking. Sixteen hundred dollars were contributed to this fund by non-residents, of which we received, from our former townsmen, H. B. Claflin, Esq., of New York, $1000; and from Charles W. Freeland, Esq., of Boston, $500; and also $100 from Hon. Oakes Ames, largely interested in business at Worcester. From the ex-

*Hon. S. Salisbury.

ecutors of Dea. Ezra Fletcher, of Northbridge, we received $500, and now, within a few days, a most timely and liberal gift of $1000 from Wm. Knowlton, Esq., of Upton, which have been appropriated to the fund for apparatus.

The contract for the building was awarded to Messrs. Horatio N. Tower and Tilley Raymond of this city, for the sum of $55,500. The whole masonry of the building was underlet by the contractors, to Mr. Lilley of Providence. The style of the front and end walls of the building was changed, after the contract was made, from mixed to square rubble, at an extra cost of $2000, to meet which, a special contribution of $1380 was made by a few liberal and public spirited gentlemen.

The external walls are made of the common granite from Millstone hill, than which it would be difficult to find a more beautiful and effective material for such use; its dark and variegated colors forming an agreeable contrast with the lighter shades of the Uxbridge granite, of which the trimmings are made. The building is one hundred and forty-six feet long by sixty-one feet wide; the tower is eighty-five feet high. A full description of the building has been recently given in the public papers, and I therefore omit it here.

For the various additions and alterations, which it was found necessary to make in the building during the progress of the work, the contractors received the inconsiderable sum of six hundred dollars. The contract was executed with commendable promptness, and the building delivered to the committee at the specified time, for the sum, including extras, of $56,100. The additional cost of the square rubble masonry was $2000. Gas pipes have been put in by Messrs. Colvin & Starkey, of Boston, at a cost of $317 22. The plumbing was done by Mr. N. G. Tucker, of this city, for $178 15. Mr. J. J. Walworth, of Boston, furnished and set the steam pipes for $1900; and Messrs. Stewart & Dillon, also of Boston, the boiler for $840. Messrs. Earle & Fuller, architects, received by agreement $1600 for their

plans and services. The insurance of the building cost $1084.

The total cost of the building, grading of the grounds, equipment and furniture, as we deliver them into your hands to-day, is $75,343 68. The very large expenditures required for the equipment and furniture of the building have compelled the committee to overdraw their account with the treasurer, to the amount of $3,924 33. Apparatus for the chemical and drawing departments will be required for immediate use that will cost an additional sum of from three to four thousand dollars.

The committee take pleasure in giving credit to Messrs. Earle & Fuller, the architects, and to Messrs. Tower & Raymond, and their sub-contractors and workmen, for the skill, promptness, and general fidelity with which their work and contracts have been executed. And, especially, would we here acknowledge the obligations which the committee and the trustees owe to Mr. James White, of this city, who, as our agent, has assumed almost the entire oversight and responsibility of the work, and has discharged his duty with a degree of skill, energy and fidelity which could not have been exceeded. If our task has been accomplished to your satisfaction, to him and not to us belongs the credit. We surrender to you, Mr. President and gentlemen, a tasteful and substantial edifice, alike creditable to him who has designed, and to those who have executed it, and which will go far to remove the reproach which has sometimes been cast upon our city, for the ordinary character of its public buildings. For its commanding and admirable location, for the beauty of its architectural design, for the general excellence of its workmanship and finish, for its adaptation to the uses for which it is designed, and for the economy of its construction, we believe it will rank among the model public buildings of the commonwealth.

Much yet remains to be done to furnish the building with the necessary books and apparatus, to build the fences, to finish and ornament the grounds, and to bring the surround-

ings in more perfect harmony with the building. We have no fear that a generous and appreciative community will permit such an institution to want any means essential to its perfect development. In behalf of the building committee, and by their direction, I now, Mr. President, surrender the keys and custody of the building into your hands.

The President, Mr. Salisbury, responded as follows:

Mr. Chairman and Gentlemen of the Building Committee:

In behalf of the trustees of this institute I receive from your hands the possession of this beautiful and commodious edifice, which has been properly called Boynton Hall, in honor of the founder of the institute, and it is my first duty to express to you the obligation, which all the friends of the institute will acknowledge, for the care and good judgment which, in the pressure of official and private occupations, you have freely devoted to the arrangement and oversight of the building. I cordially assent to your commendations of those who have been employed in the construction, and, at the risk of repetition, I think it my duty to re-echo the thanks which you have expressed.

Ladies and gentlemen, contributors to the building fund and friends of intelligent industry, this simple and significant ceremony leads me to a wide field, from which, as I cannot pass by it, I will gather a few of the objects which you will expect me to present. The first emotion that should be excited is gratitude, and I will endeavor to express this, with all possible brevity, so that the important topics of the condition, the objects and the necessities of the school may be presented by more able and acceptable advocates. You will agree with me that high commendation is due to the architects, Messrs. Stephen C. Earle and James E. Fuller, for their taste and skill in the graceful exterior, the firm structure, and the commodious arrangements of the plan and specifications of the building. Thanks and no ordinary praise are also due to the contractors, Messrs. Horatio N.

Tower and Tilley Raymond, for their good judgment and fidelity in the construction of the building in a manner satisfactory to the trustees, and not without moderate profit to themselves. Messrs. A. K. Lilley and G. H. Macomber, of Providence, R. I., the stone masons, should be honorably mentioned for their taste in combining so much of beauty with a rough exterior.

Mr. James White, of Worcester, one of the largest and most generous contributors to the building fund, deserves grateful and commendatory recognition for his greater generosity in consenting to oversee the construction, and for the faithfulness and discretion with which he has co-operated with the builders in the course of the work, and for voluntarily adding his most valuable labor. I must also express the grateful obligation of the friends of the institute to the contributors to the building fund, all now or recently citizens of Worcester, who, according to the conditions prescribed by Mr. Boynton for its location here, made up an aggregate gift of $61,111, from two hundred and thirty-one individual names, and from the collections of twenty shops and factories. This is a noble list for the generosity of many of the givers, for the variety of interests and occupations, and for the influence and character which are a pledge for the support of our enterprise. This building fund in the care of the treasurer, David Whitcomb, Esq., has been increased by income to $70,987. The balance of this fund not expended for the building and available for furniture and apparatus, will fall short of the necessary amount by about $5000. You will not pardon me if I should omit the name which stands at the top and the bottom of this roll of honor and gratitude, John Boynton, Esq., of Templeton, a manufacturer of tin ware, who, while in health, and with a good prospect of continued life, on May 1, 1865, gave, as a fund for instruction in the institute, one hundred thousand dollars, consisting in securities of undoubted value, and he reserved for the support of the remainder of his life a few thousand dollars, no more than

was necessary for his economical habits. The instructions which accompanied his gift, state that the "aim of this school shall ever be the instruction of youth in the branches of education not usually taught in the public schools, essential and best adapted to train the young for practical life, especially those intending to be mechanics, or manufacturers, or farmers."

He also directs that the school should be free to all residents of Worcester county, and that scholars from abroad should be received at a moderate tuition. This cheapness was the dictate of his own generosity, and it was not intended to provide exclusively or chiefly for a poorer class of citizens. In all our colleges, even in those of most expensive tuition, there is a larger amount of instruction and accommodation furnished gratuitously than that which is paid for. Like our town schools, the foundations of the wisdom of our people, this institute is designed to gather in harmonious association, the rich and the poor, so that mutual respect may be promoted at the outset of life.

By Mr. Boynton's direction the income of his gift of $100,000, until the opening of the school, is reserved as a fund, the interest of which must be devoted to the purchase of apparatus for the school. This apparatus fund now amounts to $26,169. Mr. Boynton was not permitted to live to see his beneficent design carried into effect. He died suddenly of pneumonia, on the 25th of March, 1867. A bequest of $500 from the estate of Deacon E. W. Fletcher, of Whitinsville, and a donation of $1000 from William Knowlton, Esq., of Upton, and the balance above stated, are the only monies now available for the purchase of furniture and apparatus indispensable for the school. We have confidence that the liberality which has carried us so far will not fail to sustain us now. The instruction fund, consisting of Mr. Boynton's gift and other donations and their income, amounts to $164,674.

By this concurrence of wealth and labor and wise arrangements, a school for scientific instruction was estab-

lished which would be favorably compared in its outfit with other schools of that kind in our country. But the expanding cup of our blessings was not yet full. The visitor, who approaches Boynton Hall, to-day, will see, at the distance of fifty feet from the north side of the hall, another building of pressed bricks, one hundred feet in length and three stories in height, graceful in form and proportions, but so different from Boynton Hall as to indicate a different origin and use. It is proper to mention that Messrs. Elbridge Boyden & Son were the architects. This fine building, with its long forge shop and engine room, also of brick, and its steam engine and complete machinery for mechanical business, is the gift of Hon. Ichabod Washburn, for a machine shop, in which the pupils of the school may be taught the use of tools and the management of machinery, under skillful mechanics, for whose compensation, and for the aid of some of the pupils, Mr. Washburn has established a fund. Thus the theoretical and the practical, the mathematics of the blackboard and the mathematics of the bench and the anvil are brought into close association. Mr. Washburn may contemplate with just satisfaction the vast and useful business which he has established by his own skill, labor and perseverance; but he may look forward with higher anticipations to the profits and the blessings which coming generations will enjoy from his wise benevolence.

Our thank offerings are not yet completed. We cannot, in this hour, forget the source from which all good counsels and all just works do proceed. "Except the Lord build the house, they labor in vain that build it; except the Lord keep the city, the watchman waketh but in vain."

I therefore ask you to give your attention, while Rev. Dr. Sweetser shall lead our thoughts in addressing the throne of Divine grace in behalf of our enterprise.

Rev. Dr. Sweetser offered a solemn and earnest prayer of dedication,

which was followed by appropriate vocal music by the choir. Then Mr. Salisbury again addressed the audience.

Ladies and Gentlemen: — Two questions will naturally come up for consideration to-day, and they should receive attention in our deliberations. First, what is the need of establishing this school? and, second, how can its object be best accomplished? I will hastily allude to the untenable grounds on which scientific schools have been recommended. There is at this time a movement, it cannot be called a discussion, among some literary men in this country and in Europe, to show that training in the ancient classics, the system which produced Lord Bacon and John Locke among the philosophers, and John Milton and Joseph Addison among the poets, and all the other names which have the highest and most enduring places among the masters of modern thought, has been made weary, stale and unprofitable by the progress of our day. It is unnecessary to argue against an assumption that is simply false. Classical learning cannot be held responsible for the absurdities of Dr. Pangloss, Dominie Sampson, and other pedants, while it may righfully boast of the useful and inexhaustible resources of our own Everett and of many others of our best scholars. It is sometimes said that our colleges teach too much Latin and Greek. A slight examination of a majority of the college graduates for the last forty years will dismiss this apprehension. Some currency has been given to these notions by a bad system of teaching the classical languages. The scholar is often taught the anatomy of the language, without being inoculated with its living spirit. Many will sympathize with the sad words of Lord Byron in his beautiful tribute to the poet Horace:

> "I abhorred
> Too much, to conquer for the poet's sake
> The drilled, dull lesson, forced down word by word
> In my repugnant youth, with pleasure to record
> Aught that recalls the daily drug, that turned
> My sickening memory—

Then farewell Horace, whom I hated so
Not for thy faults, but mine, it is a curse
To understand, not feel thy lyric flow,
To comprehend but never love thy verse."

So far as there is any unpopularity or any general disuse of classical learning, they are produced by the same cause that has put an end to apprenticeships and made so many superficial mechanics—the impatience of the age and the love of quick results. But there is no decay of classical learning nor of mechanical science and skill. There are scholars now living at whose feet the old critics, the Scalligers and the Porsons, might sit with admiring docility; and we have mechanics in our city who possess secrets of their art which the Watts and the Perkins and other honored mechanics of former days did not learn.

Much is said in these days of self-taught men, as a class contrasted with collegians. As if a man could attain any perfection in knowledge without his own strong efforts. A college diploma, like a good coat, may be an advantage, but it will not make a man. With all the aids that Edward Everett had, I venture to assert that he was as laborious in his self-teaching as John Bunyan or Hugh Miller, or any other man who cultivated the gifts of God with little assistance from his fellows. It must be remembered, however, that John Bunyan was deeply learned in the noblest and best of the classics, the Sacred Scriptures. Permit me to add one more to the fallacies which commonly travel together. The comparison of book learning with practical knowledge is a frequent and popular topic of declamation, but we all know that book learning, which deserves the name, is only the record of the thoughts and actions of men, by which that which may be transient and forgotten, is preserved.

The necessity for scientific schools arises from none of these causes, and the man of action is no antagonist, but a co-worker with the student of books. But the claims of active life are too urgent to permit full and varied courses

of study. What is learned must be directly applied. The recent exhibition of the manufactures of the world in France, is, perhaps, the best school of mechanical science that could be devised, and some of our neighbors were respected teachers and apt scholars there. The first effect of that exhibition was a sort of self examination among the mechanics of the several countries, and it was found that in general mechanical education, the German, the French, and the English workmen stand on a descending grade. If we are little better than the English, we may thank our common schools for the advantage. In a very wise speech recently made by Earl Carnavon before the National Association for the Promotion of Social Science, at Birmingham, he gracefully hints at the necessity of improvements in technical education among his countrymen, with delicate care not to disturb their self-satisfaction, and thus concludes this topic: "I will only say of all technical education, whether of the higher grades of professional life or of those lower paths with which the manual labor of the individual artizan is concerned, that its basis must be laid in sound principles of elementary instruction, and that the later teaching is dependent on the earlier."

I understand it is the object of this institute to lay such a foundation and to give such aid in the superstructure as a three years course may afford. There is no intention and no desire to establish here a rival, or a substitute for the colleges. This school will not attempt to turn out in this short period an Arkwright, a Stephenson, or a Fulton, but it may give facilities and helps which these great mechanics did not possess. I thought it my duty to give some brief hints of our objects, imperfect as they are. I am now happy to present to you those who can speak on these topics with the certainty of wise experience.

The President then introduced Prof. Chester S. Lyman, of the Sheffield Scientific School of Yale College, who made the following address:

Mr. President, Ladies and Gentlemen:

I come here to-day with kindly greetings to this new institution from the one which I have the honor to represent, as well as with cordial congratulations to this flourishing city, on the crowning of one of its heights with so appropriate a memorial of the intelligence and public spirit of its citizens.

For I cannot but recognize in every new institution of learning, wisely founded, a new guaranty of enlightened social progress — a new element in the power of the state. The old aphorism, *Knowledge is Power*, though too trite, almost, for utterance, is yet so emphatically true, that I can not well keep it out of mind, when I consider the extent to which the power of nations, not less than of individuals— the strength and glory of our civilization — rest ultimately on man's faculty of knowing — his ability to analyze and comprehend his surroundings, and use the knowledge so gained for the furtherance of his ends.

All knowledge, objective and subjective, all forms and degrees of it, all sciences and arts, all professions and pursuits, all the workings and gatherings, in short, of man's faculty of cognition, I recognize as contributing, directly or indirectly, under the light and guidance of Christianity, to the growth and power of our modern civilization. In every element of that civilization, however simple, I recognize the genius, the science, the culture of all ages and all climes.

To illustrate: — I take up that familiar trifle, a common almanac, to find the time of sunrise, or low tide, or full moon. In that mere crumb of information — two or three figures, only, express it — I recognize a joint contribution from the rich treasures of a dozen sciences — Astronomy, Mathematics, Optics, Mechanics, and many more — aided

by the highest achievements of constructive art, as seen in the telescope, the circle, and the clock of the observatory, and in the power press and the steam engine of the printing office. I recognize in it, in fact, a fruit of the grand life-work of all the Galileos, and Keplers, and Newtons, and La Places, and Herschels, and other like impersonations of genius and learning, from the earliest ages down; all this, and more, in that one little item from the almanac—all this, just to tell the plow-boy, it may be, when to be afield in the morning, or the clam-digger, when to venture out for his bivalves, or the lovers, when to take their moonlight walk.

And so, in instances numberless. In every article we wear, in every comfort and luxury we enjoy, in the mechanism of our mills, in the processes of our arts, in our collections, museums, and libraries, in all that makes our civilization what it is, we discern with equal, or still greater clearness the genius and learning and skill of generations of thinkers and whole armies of workers.

This vital connection of knowledge with civilization and the public weal, renders the system of institutions by which that knowledge is to be fostered and diffused a matter of paramount importance in every enlightened country.

Our own system of educational institutions—from the common school upward, though, confessedly, far from perfect, is yet one that, tested by its fruits, may justly be to us an occasion of congratulation over the past, of pride in the present, and of hope for the future. Step by step, it has well kept pace with the rapid growth of the nation, and shown itself ever flexible to the changing circumstances and exigencies of the times.

In the institution inaugurated here to-day, I recognize a notable step onward in that system. I see in it, not simply a new institution, but for this country, in some important respects, a new class of institutions—one proposing to itself a work quite different from that of the exisiting schools and colleges. It is this novelty and uniqueness of its functions

and objects that clothes it with special interest and importance. It is, in truth, a characteristic outgrowth of the times. The progress of the country in wealth, the growth of the sciences, the increasing importance of the arts, all seem to render as indispensable in this country, as in the older countries of Europe, a class of institutions whose chief function it shall be, to promote the efficiency of the various branches of human industry by the suitable training and equipment of those who practice them; especially, those branches which depend, more or less directly, on the principles of the mathematical and physical sciences. The mechanic arts—which underlie, in a measure, all other arts, and whose rapid progress is one of the wonders of the age—need for their further improvement, and best efficiency, all the aid they can get, both from the sciences to which they are specially related, and from the right training of the industrial classes.

In Europe, this stage of progress was reached, and this necessity felt, long ago, and, in consequence, schools of industrial science have long been maintained in France, Germany, and elsewhere on the continent, and have contributed largely—as the records of the Great Exhibitions show—to the success of industry, and so, to the wealth and power of the nations that have fostered them.

Such institutions—schools for teaching the scientific principles that underlie and vitalize the arts — are a prime necessity with every civilized people. Agriculture, manufactures, and commerce, with their associated arts, are the great recognized sources of national wealth and power. And these are so vitally dependent for success, in their higher stages of development, on the careful concentration to their support of all available auxiliaries, that the nation which does not recognize this fact, but blindly persists in clinging to the old and ignoring the new, will be forced, sooner or later, to see and lament its error, by failing to compete successfully with its neighbors in the marts of commerce.

The mortification of Great Britain at the unfavorable

comparison, in the first Crystal Palace, of many of her most cherished products with those of other countries, may afford a profitable lesson to ourselves, as well as to her; teaching us that no means of improvement are to be neglected, no training overlooked, no scientific aid discarded, if we would attain the fullest measure of success, and be able to compete with other nations for the great prize of social and national pre-eminence.

That lesson we are beginning to take to heart. The call for schools of applied science, so loud and earnest, of late years, in Great Britain, has begun to be heard here also. This is not the same call, it should be observed, as that which demands, both there and here, a larger attention to the sciences, and less to the dead languages, in our systems of liberal education. But both calls agree in this; they are calls for *more science*, and both are strongly backed by the earnest convictions of a large and growing body of thinkers, abroad and at home, as well as by the general spirit of the age.

This is neither the place, nor the occasion, for a discussion of the relative positions to be assigned respectively to the ancient classics and to the sciences, in our college courses. Suffice it to say, that with all due respect for the classics—yea, even with a very high regard for them, and for the admirable culture which classical training imparts, and without intending to disparage in the least the kindly nurture of my own honored *Alma Mater*, I yet join unhesitatingly in the call for more science — more for culture, more for its practical uses.

And yet, I join in no rash, undiscriminating cry. I preach no crusade against classical colleges. Nor would I have them, if I could, transformed into schools of phyisical science—much less, into schools of arts and trades. Let the classical curriculum, in our leading seats of learning, remain essentially what it is—nay, rather, let it be extended and improved, if there are those that wish it. The polished tongues of Greece and Rome are taught in our colleges

none too thoroughly, even now, for those that desire a classical training, and, especially, for those that are to make literature a profession. There ought always to be institutions among us, or departments of institutions, where not only these languages, but others, also, that are either venerable for their antiquity, or of special ethnographic importance, such as the Hebrew, the Sanscrit, the Arabic, the Chinese, et cetera, shall be thoroughly and philosophically taught, by the best masters of each.

Let the classics, then, remain. The old curriculum will always attract a sufficient corps of earnest and appreciative students.

But let not that curriculum be made obligatory on all. I would never goad a reluctant boy, constitutionally abhorrent of Latin, but all enthusiasm over a problem in algebra, or perchance over a fossil shell, or a whittled model of a steam engine—I would never goad such a boy, against nature, through a field, to him, all thorns and briars, and wholly unpromising of fruit; just as I would not force a lad of literary turn—a born linguist, but never able to fathom the multiplication table—to scale the rugged precipices of algebra, or plunge into the, to him, abysmal Tartarus of the calculus. In either case, it were time and toil misspent—genius wasted—nature outraged.

Let there be, then, in our larger institutions, besides the classical course—or in some of the minor ones, in lieu of it, perhaps—a distinct curriculum, in which the dead languages shall be replaced by the living, and in which a larger part of the culture than is usual shall come from training in the sciences.

Such a curriculum is demanded, alike, by the high position of the sciences themselves; by their fitness to discipine the faculties and powers of the mind; by their wealth of rational enjoyment for those that master them; as well as by their indispensableness to the perfection of the industrial arts, and, consequently, to the highest promotion of our material prosperity. To this demand some of our in-

stitutions have already responded; while others had, in a measure, anticipated it, by steps taken in the same direction long ago. Yale and Harvard, at least, not to mention others, have, according to the means at their command, kept well up with the times. And few of our colleges, I think, are justly chargeable with designedly ignoring the claims of the physical sciences, or with being too intensely classical; though some, doubtless, in their poverty of funds, may have failed to keep even step, either with the march of the times or with the actual convictions of their own faculties and trustees.

But it is not as an element of general culture, merely, that the times call for more science. The *special student* of the sciences must have facilities for pursuing them, if he will, to their extremest limits; and the *arts and industries*, also, must have the aid which their applications afford.

These ends are too important either to be ignored, or to be met by the modicum of science embraced in any ordinary college course. Special schools of science afford the only means by which these ends can be attained. Such schools, mostly through private bounty, have been attached to some of the older colleges, or established elsewhere, and they are laboring diligently, and with constantly increasing success, to meet the call of the day for more science. The Massachusetts Institute of Technology, the Sheffield Scientific School of Yale College, the School at Dartmouth, and many others, are more or less distinctively of this class.

But even with these schools in active and successful operation, that call has not yet been fully met. There must be a still wider diffusion of practical science. It must step forth from its great centers — its places of genesis and special culture — and go where it can be put in closest contact with the interests it is to benefit. There must be local institutions for these special ends — sub-centers, in which these sciences shall take on their most concrete and practical form. And these must be located at the great manufacturing centers, where they can aid most di-

rectly alike the artisan, the foreman, the designer, the inventor, in a word, the whole industrial population.

These local institutions may, at the same time, if it is thought best, and if founded for the purpose, be also centers of original scientific investigation, and aim to extend the boundaries of the sciences: but their chief functions, after all, will be to meet the local wants of particular districts, by teaching science in the concrete, or with special reference to its practical uses.

Among institutions of this special, but highly important class, is to be reckoned, I apprehend, at least in its leading aim, the noble institution to-day inaugurated. The city and county of Worcester—so widely and honorably known for the extent and importance of their mechanical and manufacturing industries—are to be heartily congratulated that the institution has been planted here. The mechanics and artizans of the whole region round are to be congratulated on so splendid an accession to their facilities for acquiring knowledge, and making preparation for their special pursuits. The business men and capitalists are to be congratulated on the anticipated influence of the institution, directly and indirectly, in augmenting the resources of industry, and enhancing the profits of labor and capital. The citizens generally are to be congratulated on the erection among them of so conspicuous a lighthouse of science—so important a center of intellectual activity and influence—with its corps of enlightened instructors, its libraries, cabinets, apparatus, and other appliances for the diffusion of useful knowledge. And last, but by no means least, those gentlemen in particular are to be congratulated, who, blessed of Heaven with noble and generous impulses, as well as with material prosperity, have, in this Institute of Industrial Science, conferred on the present and on coming generations, a boon of such inestimable value; and in so doing, have also erected to their own memories a *monumentum aere perennius*, in the truest sense — a monument as much grander than marble column or stately mausoleum, as the living intellect reigning in the

one is grander than the dead substance of the other. Be their names, then, ever honored; be their memories ever green, among their fellow citizens, among the friends and cultivators of sound learning everywhere, as well as among those, to the latest generations, who shall especially reap the fruits of their wise beneficence.

There is not, indeed, a more hopeful sign of the times, than the disposition manifested of late years, on the part of intelligent men of wealth, to multiply just such benefactions as that which attracts our attention to-day. Those already realized in the scientific schools of our land are certainly auguries of the richest results in the future, both to science and the useful arts.

Scarcely more than a beginning, however, has yet been made. The few such schools already established here and there, are none of them—or next to none—adequately endowed. The new one which opens here to-day under so favoring auspices, is destined, it is to be hoped, to do its work without the embarrassment of too limited means. But even suppose it to be always unembarrassed and uniformly successful, doing the full work expected of it; still, one lighthouse is not enough for a coast — nor even a few. Every harbor and headland if industry must be protected, every great manufacturing center should have its special school of applied science—of arts and trades.

This is pre-eminently true of New England, which, more than any other portion of the country is dependent for material prosperity on her mechanical and manufacturing industries. In agriculture she cannot compete with the more fertile regions of the west. Her mineral resources are comparatively scanty. But her hills and rocks, her schools and colleges, have nurtured a hardy, intelligent, inventive race of men, of indomitable energy, who are specially qualified, by nature and training, to pursue successfully the more difficult industrial arts. Yankee ingenuity is, indeed, Yankee power.

It clearly becomes, then, a paramount duty, as well as

interest, of New England capitalists, to sustain this ingenuity and give it efficiency and success, by fostering with liberal spirit just such institutions as that which here reflects so much honor on a few citizens of Worcester. Had I the ear of the wealthy manufacturing capitalists of the land, who so seldom reap the enjoyment from their wealth which they anticipate, and so often leave their fortunes to be litigated into the hands of the lawyers by the quarreling of heirs and legatees, I would say to them: "Good sirs, build all the palatial mansions you care to, for the enjoyment of your servants and domestics, or for your own; leave enough to your heirs, if you will, to imperil their characters both for this world and the next; but then, I humbly entreat you, invest a fair portion of the surplus for the benefit of the arts and the artizans, that have enabled you to accumulate it; invest it in suplementing and crowning our system of educational institutions with an adequate sprinkling of institutes of industrial science. You cannot, I am sure, make a more profitable investment. You cannot better subserve either your own or the public good."

Such institutions, while blessing their founders and supporters with the proud consciousness of noble deeds done, will bless also the industrial classes, will improve and elevate the arts, will stimulate and guide invention, will in all ways benefit the country and the world.

Not that every artizan can expect to be highly educated, or become profound in mathematics, or chemistry, or mechanics; but he can acquire useful knowledge enough to make him a wiser man, a better citizen, a more perfect master of his art. The highest culture is never to be thought of for the great body of men who must handle the tools and implements of the arts. Our shops and mills we can never expect to see crowded with college graduates, any more than our farms.

The mistake is sometimes made of imagining that the sons of farmers and mechanics can be trained in colleges of a high order to still follow the plow or drive the plane. But,

obviously, such a thing, as a rule, is impossible. It is against nature. You can, indeed, give high culture to a boy from the plow or the bench—provided, always, he has the brains; but in that case you rarely see him back again on the farm or in the shop. You have, in fact, educated him out of the sphere for which you intended him. His trained powers become more available in other spheres. He enters a different walk. In the common phrase of those from whose ranks he comes, he is "spoiled by going to college." It is this sort of spoiling that has given the world no small portion of its leading men in all the professions, its statesmen, authors and men of science—the worthy sons of equally worthy farmers or mechanics. But the point is, that they are not farmers or mechanics themselves. The law of transformation is inflexible. There is no use in butting against it. It has broken up, or rendered nugatory, nearly every agricultural college that has attempted a high education of farmers' boys for the farm. A professional or gentleman farmer may, indeed, have high culture, literary or scientific, and with capital enough, may live in a splendid farm mansion; but the field hand—the farmer that does his own work—will be best benefited by a lower training—by such a knowledge of principles and results as will best comport with his time, means and aims.

And so with the artizan. His scientific attainments must usually be quite limited, and of the most practical kind. Give him a three or four years college course, and he is inevitably "spoiled" for his calling. Like water raised to 212°, he passes at once into another state—a state as different from the first as steam is from water; and with this further difference, be it observed, that the new state for him is permanent. By no process yet discovered can you ever condense him again into a plain artizan, as you can steam to water.

He may, indeed, become an engineer, civil or mechanical. He may fill the higher positions in large industrial establishments. And for such functions it is, after all, that

schools of industrial science are expected, in the main, to qualify their pupils. This field is sufficiently broad and sufficiently important. Educated, practical talent is wanted in all directions, and the demand for it is daily increasing. The institutions, then, that aim to meet that demand, deserve the amplest encouragement and support.

Nor are they less deserving, also, because they help to render the arts more productive, and to increase the profits of capital. I need not speak, before this audience, of the wonderful revolution that has been wrought by machinery both in the quantity and quality of products, or of its supercedure of the old system of the division of hand labor, once so much lauded, as in pin making, and the like; a supersedure resulting in the greater profit of the capitalist, and in the still greater physical and moral benefit of the classes thus relieved of their narrowing tasks. With all this you are familiar. You see it in your own mills and factories. You see there, indeed, some of the very marvels of mechanical genius and skill. You see there that wonderful card making machine, which Daniel Webster is said to have pronounced the nearest mechanical approach to human intelligence, and looking at which John Randolph exclaimed, "All but the immortal soul!" You see there, in fine, the varied mechanism that carpets our houses, that clothes our bodies, that gives wire to our telegraphs, and rails to our railroads, and implements to our farms, and machine-tools to our shops. You are familiar with the thousand and one triumphs of machinery. I need not remind you of them further.

Nor need I remind you that the machinery of the world is to-day doing the work of thousands of millions of men; and that in proportion as man brings under his control the forces of nature, and compels them to do his work, in that proportion he frees himself from the necessity of manual labor, or, at least, makes that labor yield him a proportionately increased revenue of wealth and enjoyment. Nor need I raise the inquiry how our government could possibly

have crushed out the rebellion, but for the looms and lathes, the gun factories and foundries, the reaping machines and locomotive engines, that so well performed the tasks of the millions of men who went forth, with loyal hearts and strong hands, to battle and to victory. I need only say, that institutions promoting obviously such results deserve to be cherished and sustained.

Nor less so, again, that they stimulate and guide invention. How much native ingenuity has been wasted—nay, worse than wasted, has brought disappointment and poverty on its possessor—just for the lack of such a knowledge of fundamental principles as would have prevented its expenditure on worthless or impossible contrivances, no statistician can ever estimate. But sure I am, that had I the capital annually sunk in this way alone—to say nothing of the capital that might have been accumulated by such ingenuity rightly guided—I would engage to build up a school of industrial science to which that inaugurated to-day were but as a mole-hill to a mountain. The tons of rubbish in the Patent office, the fortunes sunk in profitless patents, yea, the very records of the mad-house, all plead most eloquently for a better guidance of the inventive genius of the land. Many a life is wholly spent in chasing that *ignis fatuus*, perpetual motion. Patents by the score are granted yearly for contrivances involving it; though granted, usually, not under that title, but some other less flagrantly obnoxious to people of intelligence—such as "Improved Motive Power," and the like. The money sunk in Worcester county alone in misdirected ingenuity would, I doubt not, amply support this Institute of Industrial Science.

But besides benefiting the artizan, increasing production, and guiding invention, the institutions we are contemplating tend to elevate the arts themselves, and place those engaged in them in a higher social position. That position is always relative—depending partly on the utility of the art, partly on the brain-power it implies; mostly indeed, on the latter; albeit the useful arts have also, doubtless,

been generally esteemed honorable even for their utility; at least in poetry and oratory, if not in social usage.

We may never, indeed, expect to see the blacksmith again actually deified and worshiped for his skill and brawn in forging the bolts of war, like Vulcan and Thor, in the world's earlier and ruder ages. We may not even see him sitting in state with kings and queens—one of the highest officers of the realm—as in Anglo-Saxon times. That early greatness of the *Smith*, which made the name one of highest honor, and explains its prevalence in every city directory, has, doubtless, long since departed, and departed forever, from the mere hand-forger of iron.

But the modern representative of the blacksmith is the mechanical engineer. He is, professionally, the true successor of the early forger of armor, and, as such, reaps corresponding honors. The Knighting of the inventer of the Armstrong gun is but a repetition of the honor put upon the ancient blacksmith, in the person of his modern representative. The social position accorded to Arkwright for his cotton machinery, to Watt for his engine, to Nasmyth for his steam hammer—the real Vulcan that forges the shafts and armor plates of modern warfare—to Fairbairn for his iron buildings and mill-work, to Stephenson for his locomotives and bridges—the position readily accorded to such men, and to their compeers in every land, shows conclusively that the real dignity of the arts rests mainly on the elements of learning and genius they involve, and that the true way to elevate both arts and artizans is to base the former on the principles of sound science, and train the latter to a mastery of those principles.

It is by such training that we shall best give true dignity to labor and best root out the old prejudices of the laborer against machinery and capital. Those prejudices have had less prevalence in this country than in the old, simply because of the greater intelligence of our industrial population. It took saw mills a whole century, in England, to

overcome the opposition of the hand sawyers; 1663 is the date of the first, 1767 of the second. Would it be possible in this country, or anywhere else, think you, at the present day, as in England a century ago, for a legislature, in chartering a canal, to stipulate expressly that the boats should be drawn by *men* only? Fortunately, we know but little of such prejudices here. Would that we knew less than we do. Would that the foreign ignorance that comes to us, and the native ignorance that exists, were both neutralized and banished by the perfecting of our educational institutions, and the better diffusion of the light of knowledge.

Let us cherish, then our schools of science. Let us welcome the light of science in all ways; not for its uses only, but for its own sake; not for the control it gives us over the forces of nature, simply, but, as well, for the revelation it gives us of the universe of God. Let us indulge in no weak dread of its teachings. I do not believe—I never have believed, and never can believe—in its alleged infidel tendencies. That allegation itself is latent infidelity. It denies, virtually, that the God of nature and of revelation is one. I do not believe—I never have believed, and never can believe—that what God says in his Word he ever takes pains to contradict in his Works, or that what he says in his Works he ever contradicts in his Word. But I do believe, and I always expect to believe, that both, rightly interpreted, are perfectly in harmony.

Let us welcome, then, light from every source; knowledge and aid from every science and art. Let us believe in progress. With the enlightenment of true science, with a living Christianity, with our free institutions redeemed and vindicated, with a wise administration of equal laws, and the crowning favor of Heaven, what may we not justly hope for our civilization? What may we not justly hope for our country?

Professor John S. Woodman, of the Chandler Scientific School at Dartmouth College, having been introduced by the President, spoke as follows.

Ladies and Gentlemen:

No other festive occasion could be so grateful to my feelings, or correspond so fully to the approbation of my judgment as the setting up a new institution of learning. You will see it can hardly be otherwise, when I say, that a good Providence has turned, substantially, the whole of my life and labor to the arduous, but noble and satisfactory work of education. Therefore, with all the joyousness, with all the congratulation, with all the complimentary words, expressed and to be expressed, and well befitting this occasion, I heartily sympathise, and need not use the time to repeat them.

Let us turn rather, Mr. President, and gentlemen of the trustees and of the faculty of instruction, in the direction already occupied by your most serious thoughts — to the nature of the enterprise you this day inaugurate — a new voyage upon an unknown sea. Is it just to say upon an unknown sea—an unexplored ocean? Too nearly so. Allow me then, using my own limited observation and experience, to discuss with you these things, now more seriously pressing you, that we may have more clearly in mind the great object of the voyage, the peculiar riches to be secured, the safe channels to be followed, and the rocks, shoals and quick-sands to be shunned; so that, when the trials come, you may receive, from your friends and the general public, what you will certainly need — that support and sympathy which can only be rendered by those who have an intelligent comprehension of the nature, purposes and methods of your enterprise.

For a century past, the three learned professions, so called, have stood pre-eminent. The doctor, the lawyer and the minister, have been respected and honored, so generally and so highly, that the best ambition of the best young

men has been stimulated almost entirely in this direction. How well deserved the distinction! How nobly, how intelligently, and with what beneficence and liberality of opinion have the special work of those professions been done! How quick and easy the comprehension of all the other great interests of society outside their profession! Is any new project before the public—a new road, a new edifice, a new school, or even a private undertaking of our own—whose counsel and advice do we value most? We go, first, to the minister, the lawyer or the doctor, as better able than others to give us sound and valuable advice, even in things outside their own profession. And what does not our country owe, for all that is most precious in our civil and social life, and over and above the medical attendance, the law and statesmanship and the religious teaching, to the influence and work of these same noble professions? What is it that has set these callings on high? Are these claims privileged before the law? No. Is there anything in the nature of the work that makes it better and more honorable? Nothing, for at different times and in other countries, all the other prominent pursuits of men—agriculture, the mechanic arts, the fine arts, and so on—have taken the first rank. What, then, is the cause? Is it simply this? The leading occupations God has put before men, for employment, discipline and duty, are in themselves alike honorable, and it is the culture, character and excellence of the man himself—not only his knowledge of his own profession, but of its relations to all other work, and of all the leading interests of society—that elevates his special pursuit. Whoever has a comprehensive, quick and sound judgment upon all that is great and good, and highest and best for humanity, makes noble the work of his hands, and puts it in higher and more fitting, and better relations to every other pursuit. And every calling, followed by such men will be elevated, and the one that has the most of such men will be the highest, whether it be law or theology, or the mechanic arts, farming or commerce, or any other. The three learned

professions have, hitherto, absorbed by far the greater portion of the liberally educated men of the times, and upon their broad culture, large views and full knowledge, stand their honor and power among men; than which none other is so evident, controling and irresistible. This is the want, this the need, the principal need, of our great industrial pursuits, and this the work of your new college.

It may be sufficient for our present purpose, to say that a liberal education is made up of these five departments—the physical, the literary, the scientific, the moral, and the religious. Each and every one of these is essential to the well educated man. Each one should receive special attention. No one can be omitted or neglected. Take physical education, for example, by which I would understand the study of anatomy, physiology, and the laws of health, and the training and exercise of all the bodily powers—the hand, the eye, the voice, &c.—best suited to health and vigor and efficient activity. Can any man in any business do without this? Take religious education—the constant and pains-taking effort to train and bring the affections, the temper and the will (not of others but of ourselves) under the control of the principles of the Holy Gospel. Is not this one of the best and most essential elements of character and usefulness, for any person for any purpose, whether servant or master, journeyman or superintendent? Do not our intelligent capitalists, seeing the necessary relationship between religion and stability, security and profit, plant the church and cherish the gospel by the side of the new cotton mill? Truly, in every calling, "The fear of the Lord is the beginning of wisdom," and whoever neglects this part of his training, suffers an awful deficiency. So the well trained man, to do best any one thing, or fill most acceptably even a narrow place, must have some culture in all these departments. Because a workman is to use only his hands, does he need no strength in his feet? Or, because he is to use chiefly the eye, shall he despise the hearing? By no means. And the best use of one capability can only be made when it is properly supported by all the rest.

The general course has been, in liberal culture, to attempt a fair elementary training in each of the five departments, and, at the same time, to make one of them central and leading, and give to it more attention and study. A liberal education upon a religious basis, was the current form in Europe a few centuries since. A liberal education upon a scientific basis is now the current leading form in Europe. A liberal education upon a literary basis has, for a century past, been the current form in our own country. The great institution that has moulded the character of our people, is the college, an American institution, planted here and there over the country, each following, substantially, the same studies, methods and objects—a compact, well balanced, single, liberal course, upon a literary basis, above and beyond the high school and academy. It embraces all the great departments of culture, but the leading work and three-fourths the time was and is, substantially, in a literary direction, and the severest and best training upon the Greek and Latin languages. Hence, literary culture—the power of expression by means of language—is pre-eminent now in this country, and from the college has pervaded every class in society. The model man is the speaker. The first ambition is to move the public sensibilities by means of words. The people have become so sensitive to this sort of excitement, that they turn with difficulty to any thing else. There has probably never been a people so highly educated as our own in a purely literary direction. What we now need is a liberal education upon a scientific basis, in order that a portion of our leading men—those whose tastes and capabilities, or whose pursuits in life are not literary—may be placed upon the same elevation; and all the industrial pursuits and all the applications of science stand upon this broad and sufficient foundation. The old academical departments of the colleges are doing a noble work. All literary pursuits want that training. Let them be cherished. There can be nothing better. That the long-continued Greek and Latin

discipline is the best work that can be done for the literary man is not disputed, and, as general training and culture, it is now the best teaching we have. The books, the methods, the schools are all perfected by a century of experience in that one direction. The sciences afford an equally good basis. But the books, the methods and the schools are yet to be perfected and put systematically upon their proper work. Liberal culture upon a scientific basis must stand side by side with the literary: with the same unity of plan, uniformity of method and singleness of aim all over the land. Then will the young men from these institutions easily and eagerly enter upon any of the applications of science in the business of life, and all these neglected fields of science, art and taste be laid open to the public and made honorable and attractive. But now we are behind in these matters. We are greatly deficient. We suffer from it. How much a sound culture in a scientific direction would steady our political career, and give occupation, vigor and calmness to our intense and loquacious mental activity. How much it is needed in every industrial pursuit, that the leading principles of all the sciences be familiar and ready at hand for application to every branch of industry. And how much it is needed to pervade, expand and tranquilize our whole social life. This, gentlemen, is the great and noble work of the Worcester County Free Institute of Industrial Science. And I bring you greeting, from the Chandler Scientific Department of Dartmouth College, and from the Academical Department also. There is no hostility or rivalry between literary and scientific culture. Each helps the other. They move in entire harmony.

The public sentiment and the public voice will often try your wisdom. For many years you will be urged to omit one or another important requisition, and allow the student to pursue only that which is *practical* and he intends to use in after life. Perhaps to omit algebra or geometry that he may study mechanics or engineering. And you will have

to explain, over and over again, how it is that the training of all one's powers, and the thorough study of those few elements that lie at the foundation of all the sciences, is the quickest, the surest and the best way to prepare for any one kind of practical work. Any other way makes only a journeyman, and though ever so useful for one kind of work, like the inanimate machines in the shop, he is powerless for everything else. An American citizen will never be content to be thus first made into a machine. He will first be made a man, an expanded, educated, controling man, and that will satisfy him because it meets all his higher and better wants, and the inferior also. Then, with intelligent individuality, he will make himself whatever he chooses. Special schools, for special technical training, are not the great want of our country to-day, though the first impression is that they are the need; because young men who have spent the time to get a fair, liberal culture on a scientific basis, or on a literary basis, cannot now, as a general thing, be kept longer under tuition, and such young men are the only persons for whom such institutions are fitted; although these special objects are the current fashion of the day, and every new institution will have to try the experiment, more or less. I have no hesitation in saying, that the great illuminating scientific power of the next half century will be a single, simple well balanced course of liberal culture, upon a scientific basis, after the model of the old American colleges. Every institution will tend in this direction by the silent but intelligent adjustment, year by year, to the necessities of the hour, till accumulating strength and force upon this one main line of work, will make it all the more valuable and effectual. But says one, "This is all well, but we do not want the liberal culture. We have not the time for it. We would learn a few things only about our own trade to help us get a living. The school offers its instruction, can we not buy what we want? Suppose the merchant should persist in selling us what we did not ask for?" The school is no place of mer-

chandise. The teacher is no trader, but a power ordained of God for higher and better purposes; standing above and in advance of his time, leading the age upward; not following the current fancies of the hour, but teaching what people most need, and what will best satisfy them when they get it. Just as the good physician does not give you the medicine you may think you want, but what will restore you to health. The good minister may be desired to interest you, gratify your æsthetic taste, to edify you, and all that; but he preaches to you the gospel—humility, repentance, righteousness and judgment to come. You get something very different from what you expected, but you find the very thing you most needed. The true teacher has his heart set upon that which is highest and best for humanity, sure that all inferior good follows, and equally sure that they who follow directly the pleasure and the profit attain to not even the inferior good. The education that attempts to gratify and stimulate current fancies, for pay, may be a fair commercial speculation, but is spurious, and has no abiding educational power. It wants the life, the vigor, the control to turn men, with a strong hand, into right paths. Such deserves not your consideration.

The three things indispensable to a good college, and wanting any one of which, it will certainly fail, and possessing all of which, every thing beside is but the dust upon the balance, are these: money, wisdom and good teachers. It is difficult to say which is the most important. Neither one is effectual without the others. Money you have, liberally bestowed. And when I contemplate the intelligent benevolence, that finds its expression in such a noble enterprise as this, I know that public notoriety is of little account. The intelligence that can even save and manage wealth, unwasted by the thousand importunities of the never-ending wants, wishes and fancies of self and of friends, and pay it over intact for a public good, looks constantly and anxiously to see it wisely expended, and only feels satisfied and rewarded when it is honestly and ju-

diciously administered. There is in our country a spirit of large liberality, of intelligent benevolence, ready to supply all the real wants of the great and good enterprises of this kind, if there existed confidence in the wisdom that is to expend the money. But, with pain, I must admit that I think they see wisdom is far more difficult to find than money. Wisdom is needed to adjust plans and aims to means; to find the highest and best things; to aim only at just what can be well accomplished; to keep out of the way secondary, inferior and outside matters, that the money and the labor may all count upon the vigor and efficiency of the few great, central objects; and that the character of the institution may be steady, growing, and permanent. The living force of the college is the teacher, and the power of the institution rests in the hands of each instructor, in his own line of work. Do not be deceived. The good professor is not, necessarily, the famous man, the great speaker, or the great writer, or the master of books, or the very learned man, or the popular man. The teacher is simply to manage his class and his subject, by patient and skillful work, so that the young men will themselves work patiently and diligently upon it and take an interest in it, and acquire as much as possible, in a given time, of the subject and of the best discipline that belongs to it, and of its relation to other things. His mind cannot be on other matters. The only hope and ambition of the good teacher is to make great and good men of his students. As to being popular, he will strive to deserve the approbation of all good men, and then take whatever comes. That is all any man can properly do. As to being a great and distinguished professor, for students to talk about, what does that amount to? He prefers that students talk about their studies and take great interest in them. And just in proportion to his quiet and steady contact and labor with his class, will be his value to the college. As to educating young men—and your institute is no place for children or small boys; let them be tutored at the high school till there is an insipient

and growing manhood in body, mind and character. As to the teacher's educating his students, it is out of the question. But he will aid, direct and stimulate, so that the student shall educate himself, and stand forth with that self-conscious power, independence and individuality, which is the best type of the American citizen and the highest type of the educated man.

In all these matters you have the advantage in this rich and thrifty manfacturing district, of the best business experience and capability. This is all you need. The idea is sometimes hinted that a college, with its imposing professors and its accumulation of wisdom, must be managed on different principles from those you find necessary in common business. Do not suffer yourselves to be confused by any such absurdity. The same direct, prompt, judicious and open management that makes your manufactory or machine shop successful, will make this institute successful; and nothing else will. Keeping the great objects before you, aim directly at them in the shortest and best way, in your own judgment, bound to no outside model or theory that you do not fully comprehend and approve. If you want anything ever so much, and have not the money to get it, do not get it. Try no such games of chance, in the hope of tempting Divine Providence. Get the best men you can for the work you want done, and expect them to do that and not spend their time on something else. And when the work is not well done change at once, as you do in your machine shops. Why, among the old colleges you would sometimes get the idea, that a man once appointed professor cannot be removed though never so inefficient, and that absurdities should be retained because they are old. Get the best students you can, and in this respect the quality will improve as fast as your character as an institution grows. Keep them well and happily busy and under your care in all the great lines of liberal culture, and when they cease to profit by your care let them go to their friends. The trials of college discipline will not disturb

you. I have no fears that the judgment and good sense, which guides so well the great industries of this region, will fail to enter here and give ample success to this new seat of learning This same sound sense and administrative ability is the great want of the old colleges to-day. It would be half just to say that antiquated methods, confusion, feebleness, pride, poverty and wastefulness, in the general administration, oppress them like a night-mare. And in my love and reverence for the old literary college and its exceeding value, I tremble for its safety. Could I say something enticing or offensive, yet sufficient to arouse the alumni and friends of those institutions to cease their mutual admiration festivities till they had put their old alma maters into a sound administrative and financial condition, I would deem it the best favor to them and to the age, that could be rendered.

You will be impatient to have character and standing as an institution; but have patience. The great element of character, not to be stepped over, is time. When your graduates go out and settle, here and there over the land, and the neighbors look on and say, "that man is intelligent and able;" "how well he attends to his business;" "he is an honest man;" "he never quarrels;" "how well he appreciates all public improvements;" "he is interested in the school, the church and society;" "his advice is sensible and judicious;" and, "he got his liberal education at the Worcester County Free Institute of Industrial Science;"— when this is felt and said, and every point of the compass indicates tidings fragrant with this aroma, you will have a character. Waste no strength in pompous catalogues, advertising for great numbers or great notoriety, or for splendid equipments, this or that. They are all temporary, futile, worse than useless. They interfere with your work of making splendid men, and this is the sole foundation of the character that will satisfy you.

Pardon me, Mr. President, if I say you are too modest in your hopes of this new institution, you have so largely

assisted. It will, indeed, fit young men better for the practical work of the various industrial pursuits of the region, and more than that. Aim at nothing short of the highest and noblest results, and why may you not hope for reasonable success in that, as well as in any less elevated purpose? Certainly. Let this be the model institution of the region. Let its plans, methods, aims and spirit pervade and elevate the whole educational system around you. Let its culture, directly and indirectly, in due time, ennoble every person in the region. This can be done. It should be done, and by a single half-century of faithful work, advance this growing population conspicuously beyond their age. And may this city and this institute, from the beneficent illumination to-day lighted here, become cherished household words by every fireside in every valley of our broad land, from the farthest Maine to the distant Oregon.

The President introduced Mr. Charles O. Thompson, elected Professor of Chemistry and Principal of the Institute, who has the confidence of the Trustees, on account of his success as an educator, and now enters on his duties here with the advantage of a recent visit to similar schools in Europe.

In the Greek races it was customary for the masters, who had trained the youth, to stand midway of the course and utter a warning or a cheer as the eager runners passed them. The panting athlete drew a sudden inspiration for new exertion, at a critical moment of the race, from the familiar voice he had learned to trust. It strengthened his flagging courage and gave him new hope of victory.

With the same emotion have I listened to the distinguished educator who has just addressed us. After ten years interval—almost midway in this long race of life—I hear words of advice and encouragement from the counsellor and teacher of my youth; words to which I listen all the more eagerly as receding years have made more precious that earlier instruction. I come, under these strangely altered circumstances, to find the unreasoning admiration of

boyhood changed, by unconscious magic, in full measure, into the respect and confidence of manhood.

Alas, Sir, that my orbit must forever be an asymptote to yours.

Age and care have not wholly neglected you in the past, I see. May age and care deal gently with you in all the years to come.

Serus in cœlum redeas!

The exigencies of the hour compel me to defer to a more convenient time, the discussion of the general subject of technical education, and proceed at once to state the history, purpose and plan of this new effort in its behalf. To this end, a glance at the general field of educational effort will suffice.

President White, of Cornell University, in his inaugural address, calls attention to the subtle sense of the true source of the strength of the nation, which led congress, in the bitterest moment of the war, to appropriate land to found agricultural colleges.

Mr. Phipps, the agent of the Massachusetts Board of Education, has entered into a laborious computation to exhibit, in an exact form, the actual excess of wages received by the Lowell operatives who have had some *education*, above the average of the others; and so to find a certain fixed ratio between the increase of intelligence and the increase of wages. There could not be two methods of reasoning, on the same subject, more widely diverse, and reaching the same certain results. The most philosophical patriotism and the purest selfishness are stirred by the same appeal. At some point between the desire for knowledge for its own sake, and the quest for it as a means of pecuniary emolument, lies the opinion of every man who thinks at all on the subject. But no question, at the present moment, engages more completely the most serious attention of the most thoughtful men, than this of *popular education*. With

all the diversity of sentiments and of feeling, there is one quality common in all *expressions* of opinion, and that is *dissatisfaction*. It is plain that present methods do not meet all present wants. Many who take no part in the war between classics and sciences, and some even who fight with the Greeks, are convinced that there is a defect somewhere in modern methods of education; that too many boys rush half-trained into business, and are hopelessly dwarfed at the outset; that too many college students spend the four best years of their lives in high social converse with their friends or browsing in the libraries, instead of *working* to master the college studies. It cannot be shown that the American college, regarded as an organic force, has essentially degenerated, excepting, perhaps, in the quality of moral courage. It *is* true that hundreds of boys enter college who are not fitted in any proper sense; but once in, the college does its best for them. The method of teaching the classics in preparation is, in many cases, unscientific and bad. So, as the quality of scholarship which the college finds in applicants has deteriorated, the results of college training have become less and less general and conspicuous.

But it has been found that men can be tolerably good doctors, lawyers and even ministers without a college diploma, while the *supremacy* in those great fields of intellectual labor where the results of abstract thought must be directly applied to the promotion of the welfare of mankind in material things is conceded to many men who are guiltless of Latin and Greek. Again, in calculating the efficiency of the *college*, even when regarded, as it ought to be, as the highest educational force in the country, too much importance has been attached to the studies pursued, and too little to the quality of the teaching. Thomas Hughes was not moved to the noble issues of his magnificent manhood by writing hexameters at Oxford, but by feeling, every day, the magnetic power of Arnold of Rugby. Osgood Johnson so stirred the ambition of the more thoughtful boys at Andover, and so thoroughly identified himself with them in

their noblest efforts, that to secure his commendation seemed to include all human happiness. One of these boys was John Newton Putnam, to whose exact and most elegant scholarship, combined with rare grace of teaching its best results, hundreds of graduates of Dartmouth College, in all departments of practical life, look back with gratitude and admiration, as the source of their best methods of thought. There are, to-day, lawyers unraveling complicated cases, ministers seeking effective methods of presenting sacred truth, physicians searching into the mysteries of human life, teachers doing their unpretending but imperishable work, merchants solving the problems of trade and finance, who feel, each in his own emergency, the present help of that old college training, which was not in the Greek language, but in living contact with that calm, genial, self-contained, imperturbable man, who had reached through the Greek and laid hold on the eternal principles of human action which had their best expression in it. The subtleties of the language were to him phases of the wonderful mind; its difficulties—there were none for him. Its beauties he made suggestions and types of all beauty. The orations of Demosthenes were not in his class-room happy illustrations of Greek grammar, but a model whence, by most dexterous manipulation, he formed in his students' minds ideas of persuasive eloquence. Through the Greek plays he let the pupil look into the noblest human conception of the power of the supernatural and the invincible force of truth. The dullest intellect was quickened, the grossest tastes were elevated, the most depraved morals even were purified by the power of his scholarly manliness. He was strong without being resistless, refined without a suspicion of effeminancy, exact but not pedantic, a lover of truth, but charitable towards all who erred; full of all delicate tastes, but not fastidious; and to crown all he had the power of inciting every pupil to strive to obtain the same gifts. He was a model teacher. But the world has heard more of the Greek language, as

taught at Dartmouth, than of the man who taught it—rather who *taught through it.*

For these reasons, the lack of adequate preparation, inefficient teaching, and others, a conviction has slowly fastened itself upon the minds of thoughtful persons, that the *college* has failed to meet *all* the wants of a nation which develops *new* wants with every year of its existence. It does not mend matters to rail at Americans for their notorious practicality and want of æsthetic culture. True there is no Parthenon in our Athens; but what we want is to know where are the hewn stones out of which we can build one.

All attempts at revolution in education have failed. Witness the phonetic system, business colleges, and indeed the persistent efforts, made of late, to destroy confidence in classical training. Revolution is not what sober men want; but *reformation.* Mr. Goldwin Smith's aphorism is much quoted—"Let us never glorify revolution." The difficulty is this: granted that the college is as good as ever, not more than one boy in ten goes there, and a considerable percentage of those who do go, waste the time spent there. Shall nothing be done for the other nine-tenths of the boys? Shall they go on learning trades, without the slightest idea of the principles on which trades depend? Shall there be no response to the cry of need embodied in the ejaculation of that Chicago locomotive-driver: "I know how every part of that machine is made, Sir, but I'd give a thousand dollars to know why she's made so."

Again, it is not to be supposed that every laggard in college is of necessity a fool. In many cases, boys are forced into college and forced to stay there four years, who have no inclination or taste for the college studies, and to whom the whole system of instruction is a prolonged and unmitigated torture. How many times you have seen boys *drilled* by the hour in Greek, who had long before lost all interest in the study and accepted the situation as inevitable fate. Boys are often placed in this false position through the most laudable

ambition of fathers and mothers, to give them an education, and there has been, hitherto, no alternative. It is cheerfully conceded that a classical training may be the best way to develop the tastes and mould the minds of boys who do not exhibit any special aptness for any form of effort. Or, if it is conceivable that American boys, as a class, are willing and able to devote seven years to pure intellectual training and then begin preparation for real life, perhaps there would be no room for argument. But the question *for us* is, what provision shall be made for the education of American boys as we find them. There have been three phases of thought on this question in New England.

The first grew out of the fact that the Puritans came here to found a *church*—not a nation. The school was subordinated to the church and under its control. Let us thank God that our fathers laid deep these two corner stones on which subsequent generations have reared such a fair superstructure! But to them the church was of all-absorbing interest. In that elder day to be a minister was "greater than a king." The most promising boys were sent to college, and then, if "called to the work," were fitted for the pulpit. Trades and manufactures were held to be occupations in which the adversary had men at an unusual advantage. This phase of opinion is well embodied in the common family words: "That boy is n't smart enough to go to college. We must put him to a trade."

The second phase came in with the close of the war of 1812, or perhaps with the public career of Thomas Jefferson. It was a kind of modified iconoclasm. A disposition to hold learning in contempt. It never took deep hold anywhere, and soon softened into a determination to erect, beside the college, a school where the mathematics, sciences and modern languages could be taught, and boys could be fitted more immediately for practical life. This union with the college has proved detrimental to the scientific schools, in many respects, and the professors in these schools are almost unanimous in the opinion that they would gain by

securing an independent foundation. But precisely out of this nettle danger, the flower safety was plucked. The Institute of Technology in Boston is the latest expression of this new opinion, and one of the noblest. It is, in fact, the only institution in the United States that answers perfectly in its plan to the German and French Polytechnic Schools which are the best of the kind in the world. But, for most, the scientific schools and the Institute of Technology are too expensive, and the course of study pursued in the former, at least, too theoretical. They have not served to correct the current infidelity on the subject of thorough education. In the popular mind this phase of thought has sometimes found expression in the flippant saying, "John went to college, he was n't fit for anything else."

The third phase is embodied in the question: "What shall be done for the boys?" High schools are not high enough, and are only possible in the larger towns. Colleges are not ample enough. Scientific schools are too theoretical for the majority of boys. The Institute of Technology is crowded, but were it not, it costs too much for most. Boys in general make haste to be rich rather than wise. We must have a course of study and the *drill* of the classroom. Knowledge is wealth as well as power. The surest way to strengthen the nation is by an increase of intelligence controlled by religious principle. The mass of boys, as things are now, are not properly educated. The question recurs again: "What shall we do for the boys?"

One answer to this question is the new institution which is this day dedicated to the service of sound learning.

In the year 1865 John Boynton, of Templeton, placed one hundred thousand dollars in the hands of his life-long friend, David Whitcomb, for the endowment of a free school. Mr. Boynton had no fixed idea in respect to the plan of such a school, but had long wished to do something for the cause of education. He was a man who had toiled in the work-shop. His wealth was the result of a life of industry and frugality. But, as it has happened in thousands

of like cases, he was led by reflection upon his own limited opportunities for acquiring knowledge in his youth, to think much of the needs of boys who cannot or who will not go to college. Mr. Whitcomb entered, with warm sympathy, into the plans of his friend, and, keeping the name of the donor a secret, took counsel with such able advisers as Dr. Seth Sweetser and Judge Emory Washburn. As the result of much investigation and correspondence, Mr. Boynton executed the remarkable instrument which was the foundation of this school. He declared his earnest desire that this school should be for the better education of boys who do not intend to enter any of the so called learned professions. Hence he indicated some studies to be specially pursued; mathematics, including civil and mechanical engineering, drawing, designing and modeling; architecture; chemistry, including metallurgy; the French language; book-keeping, and the science of teaching. He also directed that the pupils of the school should be instructed, as far as possible, in the use of tools and the manipulation of machinery. Not unmindful of the character and reputation of the youth who would enjoy the benefit of his generosity, he wished that the provisions of the General Statutes of Massachusetts in regard to religious instruction in schools should be carefully observed, and that the bible should be daily read in the school. To guard this important trust, a body of gentlemen, equally conspicuous for learning, business ability and practical mechanical skill, were constituted, under the laws of the State, trustees of the Worcester County Free Institute of Practical Industrial Science.—All royal personages are christened with long names. Loyalty and affection soon contrive to shorten them. Perhaps in a few years we shall know our institution as the Worcester Technical School.

While this man of plain sense and practical business ability had been gradually solving the problem of "what shall be done for the boys?" another man of plain sense was looking at the question from a totally different stand-

point. Educated at Harvard College under the old *regime*, familiar, after the manner of that old *regime*, with the Greek and Latin classics, deeply indebted to classical training for untold pleasures of taste, in the catholicity of spirit which is thus engendered, he could but wish that the boys, whose whole ambition and inclination point them towards the shop or the counting-room, could have a better education than, under existing forms, they are likely to get. This gentleman who presides to-day over the ceremonies that signalize the accomplishment of his wishes, at once, by a most liberal gift, responded to the condition imposed by Mr. Boynton, that the citizens of Worcester should provide suitable grounds and buildings. To his aid came another from the ranks of the practical men, (whom physical infirmity hinders from honoring this occasion with his presence). So that ethics and mechanics join hands, by a new but by no means unnatural alliance, in this new enterprise. Following the lead of these liberal donors, came a large number of the generous citizens of Worcester County; so that in a short time the necessary amount was subscribed to secure the donation of Mr. Boynton, and the scheme was fully inaugurated.

At this stage in the history, occurred one of those instances of the surrender of personal preference to the general good, which are as rare as they are most praiseworthy.

Mr. Ichabod Washburn had long cherished a purpose to provide some means for educating apprentices in a more substantial manner than is at present in vogue. Himself a manufacturer on an extensive scale, he could appreciate the importance of founding practical skill in the industrial arts on a knowledge of the sciences on which those arts depend. So impressed was he with the importance of combining theory and practice in the completest possible manner, that he cheerfully consented to merge his own scheme in this, and made the princely contribution of a fully equipped machine-shop. He proposes to place it in charge of a competent, practical mechanic, to employ a certain number of

skilled workmen and to receive boys from the school as apprentices. They will thus learn, as in any shop, the use of tools, the management of machines, and in short, the working of wood and metals, in connection with and illustration of their daily lessons in the school. They will work about three hours a day and be under constant, and, it is hoped, effective supervision. The shop will be ready in the spring. It is expected that the power of the shop will be expended in the production of articles of standard value, which will be sold in the regular way of trade. To stock the shop for the first year, Mr. Washburn gives $5000, and, to pay the salaries of the superintendent and skilled workmen, and to defray other expenses, he gives the interest of a fund of $50,000. Though the main design is educational, it is hoped that under such circumstances as these, some profit will accrue to the shop, after all expenses are paid and the stock kept whole. Any such income Mr. Washburn wishes to be devoted to paying the expenses of worthy boys, incurred during their attendance at the Institute; for a prominent motive in the endowment is to make it a charity for those who merit such help.

In the shop as in the school, after mastering general principles, boys will devote themselves to whatever special departments their tastes lead them; but the choice once made must be adhered to. Boys will not be expected to range through the shop picking up scraps of information. According to this view of the case, the school and the shop will exactly supplement each other.

This practical element in the Worcester school is so novel, and so much distrust is cherished towards all so called manual-labor schools, that I venture to glance a moment at some of the causes of failure in the experiments hitherto tried. In some cases the relation of the manual labor department to the institution has not been intimate enough to prevent its utter separation from the other departments. It has either died out or gained an independent existence. Whether the manual labor has been performed on the land

or in shops, whenever it has not had a close connection with the studies of the school, or formed a part of them, it has not secured the cordial support of the students. It has been *playing at work*, rather than work—and some other form of amusement has proved more attractive to the pupils. So the experiment has often failed on account of sheer indifference in those for whose benefit it was designed. In other cases, the income has fallen so far below the expenses that the department has been abandoned in disgust.

Educators in Europe have experienced similar difficulties, though experiments in this line have been more vigorously pushed in France and Germany than here. At Berlin the workshop connected with the school was tried and abandoned; then again, with the same result. Now the third experiment is in progress. At Vienna and other centers of technical instruction there is the same record of failure. As regards German schools, the result could have been predicted. The Germans carry economy beyond the limits of prudence. Hence the shop was not well equipped, in many cases furnished with cast-off machinery, under the idea that such was good enough for boys to learn from, and the labor in the shop must be all done by the boys under the care of a superintendent. It is no wonder that such a shop fails to be largely remunerative. There is another plan much in vogue in Germany, which was easily suggested by the failure of this. In the month of September the pupils of the Polytechnic School are required to spend a certain number of hours each day in a shop or factory, according to the special line of study pursued by each, and to report in detail on their return to the school in October. This plan has its advantages to be sure, but it falls so far short of what is needed, that it does not satisfy any one. At the famous Ecole de la Martiniere at Lyons, the shop is an integral part of the school. Every boy works in it at least one hour each school day, till the time comes to press laboratory work and modeling, when all who pursue these branches are excused from the shop. The teachers and friends of the

school have as much faith in *this*, as in any department.

Now it is very plain, first, that work done by apprentices solely, cannot be first-class work and nobody will buy it in open market; and secondly, that a shop where second rate work is done, is not the place for boys to learn. The experiment about to be tried in Worcester, will not fail for any of the causes just mentioned. The work produced by the Washburn Machine Shop will be the best of its kind. Hence it will sell well, and at the same time be a good model for the apprentices. The boys will have nothing to tempt them to slight the work for the sake of some temporary advantage. The apparent disadvantage of a large number of apprentices is balanced by the gift of a full *stock*, as well as complete machinery, at the outset. So that after keeping the stock good, and paying all expenses, there must be some balance to be applied to the benevolent purpose of the donor, to aid deserving young men.

The question is often asked "will all the boys work in the shop?" Probably not. Those who choose chemistry as their special study will certainly need all the time which can be spared from the class room, in the laboratory. Those who aim at being machinists will be expected to work in the shop. But *precisely how* this matter will be finally adjusted, it is not possible to say at present. This, at least, is certain, every student in the institution will have as broad an opportunity, as is possible in any school, to learn the practical applications of everything he studies. Add to these considerations the facts that boys whose faculties are kept constantly alert by the training of the school, are in a condition to learn, faster than others, the practical applications of science, and that the time spent in the shop will serve the double purpose of instruction and physical exercise, and it will be admitted that this form of a manual-labor school is at least an experiment worth trying.

With this somewhat prolix exposition of the most obscure feature of our enterprise, I hasten to say, more broadly,

that the Worcester Technical School offers to the boys of Worcester County an education based upon the modern languages, the natural sciences, drawing and the mathematics. Technical education means a symmetrical discipline of the mind as an ultimate end, and practical familiarity with at least one form of applied science as a proximate end. To gain these ends it follows the line of studies just enumerated. It aims to furnish the same capital for the practical man that the college gives the professional man, and in addition to that, some acquaintance with his business. It is not supposed that boys will be suddenly changed into responsible men; it is not supposed that the school will give sagacity and business ability where these are lacking. But it is supposed that it will give every boy a good education, and a means of earning his living besides. With this start he must enter the lists and fight his way in the world like other men. Reliable men do not spring into existence Minerva-like, full-armed. Skill and good judgment are the growth of years. This, in short, is what is meant by technical education. We borrow the name as well as the plan from the Germans, and a hasty glance at the German system, may not, therefore, be out of place. The lowest school in the Saxon system is the Bezirk Schule. To this, in the main, corresponds the Kindergarten, which draws its support wholly from private sources. Above these is the Burgher Schule, though sometimes including pupils of an age more suitable to the Bezirk Schule. These two grades are not sharply defined. Children remain in the Burgher Schule till the age of fourteen, at most. Up to this point they all have the same training—in reading, writing and spelling, *drawing*, arithmetic, latin, geography, history and singing, with daily lessons on religious duties. Beyond this point there are two distinct, parallel courses. At the age of fourteen, and sometimes sooner, the German boy must decide his course for life. If he aspires to University honors, he enters the Gymnasium and thence passes to the University. There he may pursue theology, medi-

cine or law, or theoretically, any other branch of human knowledge.

But, in effect, all knowledge of applied science acquired at the University is wholly theoretical. Practical, is a word at which university men shudder, while *liberal*, in the special sense of the word, alarms the Polytechnikers. If the boy decides not to go to the University, he enters the Real Schule, where he remains two years, and then, at the age of sixteen, enters the Polytechnic. In the Polytechnic School, *drawing*, pure mathematics, physics and the French and English languages are taught with great thoroughness to all the pupils. After a fixed period, generally at the middle of the course, the boys are placed in separate classes a part of the day, according to the department chosen by each, as a specialty, whether civil engineering, mechanical engineering, practical chemistry or commerce. At the same time there are studies of a more general character which all must take. Another plan is to divide the pupils into sections at the outset, and have a general course adapted to the wants of those who do not wish to enter a special. In these two schools, the Real and the Polytechnic, the tastes of the student are carefully consulted at the outset, but his course once decided, he must follow it rigidly. The Technical schools have a great advantage over the Academic, and the results are correspondingly excellent.

The University *students* affect a kind of contempt for the Polytechnikers, partly due to traditions and partly to jealousy; but the *Professors* in corresponding departments in the two systems, meet on terms of perfect equality and good will. I attended a gathering of the German Natuerforscher and Physicians at Dresden, where Prof. Hoffman of the University of Berlin, joined issue earnestly and cordially with Dr. Fleck of the Saxon Polytechnic School, in topics in chemistry; and, in general, as far as distribution of offices was concerned, and the respect shown to the various speakers, I could not discover the slightest advantage on the side of the University men. The same system of

education obtains in France. The emperor has been a warm friend of Technical schools, and has established them in nearly all the large towns of the empire. In many respects, as mechanical drawing, the French schools are superior to any others in the world. The superiority of the French and German manufactures over the English, at the International Exhibition, was largely due to these schools. The most advanced statesmen and educators of England found a solace for their mortification in vigorous efforts to establish similar schools in Great Britain. Even British prejudice is rapidly softening in the rays of this new sun.

Now while the general training in all these schools is the same, discipline of the powers of observation through the natural sciences, of the sense of form and proportion through the practice and study of drawing, of the reasoning powers through the pure mathematics and of faculty of expression through the study of some language other than the pupil's own, the number of special departments or forms of applied science in which instruction is given, differ greatly. It is determined more or less by the prevailing occupation of the people in the locality where the school is established. At the Ecole de la Martiniere at Lyons, the city of silk, Chemistry is the prominent study, though great importance is given to the department of mechanics. At Chemnitz, famous for machinery, these two departments change places in prominence. In Saxony, Mining Engineering is made the prominent study. The length of the Polytechnic course varies from two to four years.

But it may be asked, what does all this instruction amount to? Did it ever occur to any one to inquire who directs the dyeing of the Lyons silks, the French, German and Belgian cloths, and the ribbons of Basle? Who draws the designs for the prints, who models the ornamentation on thousands of articles of glass and crockery ware, who direct the myriad factories, gas works, machine shops, mines and smelting furnaces in Europe? Such are in general the varied occupations

of the graduates of the technical schools. These young men are never left without employment. They seldom seek long for places. The government always aids in supporting the schools and offers prizes for excellence in any department. The most promising graduates are taken at once into the service of the government. In France especially, if a boy in a technical school, shows special aptness for drawing, mathematics, designing, engineering or any other branch, he is promptly noticed by the government inspector and reported. After this the government directs his studies and in some cases pays his expenses. This is the secret of the extraordinary ability of the French engineers. The benefits of this system are not confined to France. Every one who has traveled in Switzerland has noticed the splendid carriage roads that lie upon the sides of the mountains like enormous serpents. These furnish a single illustration of the efficiency of the French engineering. And every other country borrows from France. In the United States for example, fortifications are built after Vauban, and carriage roads according to the plan in Savoy. Indeed a knowledge of the French language is indispensable to one who would keep pace with the advancement of Science and Art.

But this system in its perfection, cannot be at once transferred to America, for many reasons. The most prominent of which is the radical difference between the European boy and the American. Take the German as a specimen. He is trained from infancy to a certain subjection to his master, the American begins to cherish independence of all masters, almost before his training begins. The German boy stands quiet to be chiseled into shape — the American is never quiet, and the artist's first endeavor is to keep him in one position long enough to receive an impression. The German boy is a block of marble—the American, plastic clay. The German expects restraint and is helpless without guidance—the American is impatient of all restraint, and wants no guide. The one has talent, the other genius. The German knows everything about something—the Ameri-

can knows something about everything. One builds of stone, the other of wood. The world owes more to the German—it expects more of the American. Now, to superinduce as much as possible of the thorough discipline of the German school upon the American enthusiasm is the problem. It is hoped by energy and enthusiasm in teaching, to interest the boys of this school so deeply in their studies, that they will find a pleasure in working and so solve this problem.

Another obstacle to the success of technical education in this country is the lack of good instruction in our primary schools. It is hardly too much to say, that outside our cities and large towns there are scarcely any good schools for primary instruction. The elements of drawing, geometry and arithmetic must be thoroughly taught to children, in order to the best results in technical schools for youth. Teachers too often have no aim beyond the passing hour, and aimless instruction is almost always fruitless. The able superintendent of the Boston schools, has lived to see his theory, which was scouted at first, verified and accepted by the most experienced educators. This theory is, that the most important school is the primary, and that only those teachers should work *in these* who have been educated in the highest schools, and so discerned the true relation between the lowest and the highest. Our school is nearly of the same grade as the German Real Schule, though we aim at a more extended course; but boys who enter the Real Schule have been taught free-hand drawing in the most thorough manner. There are some drawings of this sort to be seen in Prof. Gladwin's room, done by boys under thirteen years of age in the Saxon schools, which are so spirited and accurate that older artists would not be ashamed to own them. Now *drawing*, free-hand, perspective and geometrical, is the alphabet of all technical literature; nothing can be worthily done without it. Next in importance is a knowledge of pure mathematics. Indeed these two elements are so closely connected, that it is hardly possible to conceive of one without including the other.

But to acquire a competent knowledge of these branches, more time and patient application is needed, than boys, under existing forms, are willing to give. If boys have some ease in free-hand drawing, and have mastered the elements of arithmetic, algebra and geometry, they may hope, with diligent application, to become proficient in engineering in three years. If not, the only alternative is to devote a year to *preparatory* study. Hence in this Institution there will be a regular course of three years. The classes will be known as the Junior, Middle and Senior. Beside these classes there will be a Preparatory class. It is not likely that this class will be organized again. We hope, next year, to admit boys only to one of the regular classes of the Institute. The necessity for this class will disappear when the proper relation between this school and the others is established. The course of study will be as follows: In the Preparatory Class — Free-Hand Drawing, Geometrical and Perspective Drawing — till the shop is in operation, this class will devote twelve hours weekly to drawing;— Arithmetic and Algebra, six hours weekly. The class will study Fractions, Percentage and Exchange, Ratio, Powers to the 3d degree, Equidifferent and Equimultiple Series, Factoring and Equations. Some knowledge of arithmetic is presupposed, and these topics will be studied, not according to the order of any text-book, but according to the natural order of philosophic generalization. The class will also have daily drill in rapid arithmetical computation, Geometry — theorems concerning lines, angles, plain surfaces, triangles and the circle, with practical application of the theorems in the solution of geometrical problems; the French language, Physics, General Properties of bodies, Equilibrium, Forces and Pneumatics. This class will have frequent exercises in declamation.

The regular Junior Class will have in Algebra, the topics requisite to a thorough knowledge of the advanced mathematics; in Geometry, demonstration of theorems, solution of problems, and the most important practical results

of geometrical investigation; in Trigonometry, solution of plane triangles, reduction of trigonometrical formulæ, problems, elements of spherical trigonometry, surveying with chain and compass, plotting, calculation of areas, leveling, topographical mapping, use of the theodolite, triangulation and methods of the United States Coast Survey; in *Physics*, the elementary topics essential to a successful study of mechanics. It will be expected that this class will spend the month of July in field work, under the direction of the instructor. Reports of this work, accompanied by plans, will be required at the beginning of the fall session. They will study Inorganic Chemistry, with laboratory practice, Free-Hand, Geometrical and Perspective Drawing, and the French language. They will also have exercises in Declamation and English Composition as often as practicable.

The Middle Class will have Analytical Geometry, Descriptive Geometry, Perspective and Mechanical Drawing including Shadows, the Intersection of Surfaces, and the different methods of Mapping; the Calculus, with its more important practical applications; Chemistry, organic and inorganic, and the French language, with general exercises as in the other classes. During the last half of the middle year, the class will be arranged in sections, according to the special course which each pupil will enter for the senior year, and the studies appropriate to each will be pressed.

The Senior Class will have general exercises in Mathematics, Physics and Language as a class, but the principal work will be in the special courses. For instance, those boys who aim at being mechanics will have more hours weekly in the shop than others and will study machine drawing and construction. They will also be expected to spend a part of the vacation in some kind of practical mechanical work. Those who aim at being draughtsmen and architects will pay special attention in the shop to working in wood, to Architectural Drawing, Modeling and Designing. They will have opportunity to study models and pho-

tographs of standard classical works. Those who have a taste for chemistry with its applications to the arts, especially the manufacture of chemicals, dyeing, electro-magnetism and metallurgy, will work in the laboratory. Those who aim at mining engineering will be thoroughly fitted to enter the Freiberg Mining School. This, without doubt is the best place, and I might almost say, the only place in the world where Mining Engineering can be thoroughly learned. Theory and practice go hand in hand through the course. Every doctrine taught in the lecture room, is at once illustrated and explained, not by models and drawings of a mine, but by a mine. The simple location of this school, in the Freiberg mining region, gives it an incomparable advantage over any other. Add to this the fact that the Professors are among the most able chemists in the world as well as practical miners, and there is no room for question. To this end they will press the study of the German language, blow-pipe analysis and general laboratory practice, in connection with the study of civil engineering. Those who have no taste for any of these branches of knowledge will have a short course of instruction in Book-keeping, Political Economy and the Laws of Trade. The peculiar fitness of the course in Mechanical Engineering, for those who intend to study the Laws of Patents, must not be overlooked.

The time which can be profitably spent in study and recitation, on an average, for boys under twenty and over twelve, has been fixed by careful observation, at seven hours a day. Apprentices in our machine shops work from nine to ten hours. The main argument for the eight hour system is that mechanics need more time for self-improvement. In our plan, since courses of intellectual discipline and of mechanical training are carried on simultaneously, it is but fair to suppose that the two will supplement each other; so that, since the shop work will furnish the requisite amount of physical exercise, at least during the first two years, it is expected that at least eight hours a day will be

devoted to the work of the Institute by each pupil. Probably more than this will be found practically necessary.

Physical training will not be neglected, and all manly sports will be encouraged. It will be the aim of the instructors to stimulate, by all possible means, the sense of self-dependence and self-respect in the pupils; to teach them to love virtue for its own sake; to watch with all solicitude against the approach of evil, and, in short, to inculcate those principles of conduct which underlie that excellent citizenship which is the glory of America.

One prominent idea in the minds of the founders of this school, was to help young men who need and deserve help to make a start in life with that best of all capital, a good education. But they aim and wish to make it, like the other public schools of Massachusetts, good enough for the richest and none too good for the poorest. For this is, in all essentials, a public school. It fills a place hitherto unoccupied. It is the ardent wish of the trustees and the instructors to maintain the most cordial and intimate relations with the public schools of Worcester County. Indeed it is only in that way that the best results can be attained. I am sure I am right in saying that it would be deemed a misfortune, by the founders and friends of this school, if it should come into collision with any other. From the very outset, through all the coming years, in all our affairs, internal and external, under every trial and under every vicissitude, "Let us have peace."

Every new enterprise begs some indulgence at the outset. No school can grow to maturity in a day. Many boys have applied and been admitted, who should have remained in the Grammar or High School, but this is plainly unavoidable. As time goes on, we hope to raise the standard of admission to the Institute, so that only boys who have been through the High School, can enter; so that the Institute shall stand in the same relation to the High School, in respect to *technical* education, that the college now holds in respect to *classical*.

Such in brief, is an outline of the plan of the Worcester Technical School. It makes no pretensions, but asks for recognition as an effort to diffuse, more widely, the principles of sound learning and effective living. It is not, as has been supposed by some, a place where boys can be housed, fed and clothed at the expense of the Institution, a reform school for juvenile offenders, a pauper school, or an industrial school in the popular sense of that term, any more than it is an asylum for idiots or for aged and decayed punsters. It is not a place where boys can come to earn a living AND pick up such crumbs of knowledge as fall in their way from the master's table. One important idea in the plan will fail of accomplishment, to be sure, unless some boys do receive material aid as an incidental result of their own labor, according to the view above presented; but the main design of this school is to make it an educational force; to open the delights of learning to the mechanic and the manufacturer, as well as to the professional man; to aid in giving practical expression to the maxim that knowledge is power. It is a place where resolute and intelligent boys can come to be educated for the life which is before them.

As Emerson says, it is impossible to state a truth strongly without apparent injustice to some other truth. This school is not a subtraction from established means of education, but an addition to them. Its friends recognize the place and the power of classical training, but they do not regard it as omnipresent or omnipotent. They seek to reach and help those for whom such training has no charms. They remember that in the dark ages—that time of blank dismay for humanity — classical learning was at its height, but it was only for a class. Everything for the thinker—nothing for the worker. They aim at helping on that grand equipoise of intelligence, when, behind the arm that smites the anvil or guides the plow, there shall dwell a soul tranquilized by the same philosophy and stirred by the same high hopes that guide the pen of the scholar, or breathe inspiration into the words of the orator. When, as evening

comes on, the manufacturer shall leave his looms, the merchant his counting room, and the mechanic his workshop, and each in the quiet of his home, share with the scholar, communion with the great and good of past ages; and so find, gradually accumulating in his soul, those stores of hidden wealth which are the solace of adversity, the comfort of retirement, and the strength of declining years.

Able and accomplished instructors have been appointed the departments of mathematics and drawing, but even with this strong support, I should shrink in dismay from the heavy burden which must devolve upon the Principal of the Institute, were I not assured that in the sound judgment, liberality and forbearance of the trustees, I can find help in every need. With such supporters, and with such fellow laborers, one can face without alarm, the most appalling difficulties. In fact, gentlemen of the trustees, you are the upper, we, the lower house, and must cordially cooperate in securing the highest success of this little republic. In what nobler work could we engage? What more exhilarating prospect could allure us than the better education of the boys who are eventually to be pillars of the state.

In the mountain region of Germany there is a strange sight which most travelers see. It is a phenomenon of fearful portent to the superstitious villagers. The traveler is led by the awe-struck peasant guide, towards evening, to a certain secluded spot, whence he takes in at a single glance an extensive and beautiful valley. But he is startled as he gazes on the quiet scene, to see a human figure of marvelous size stretched at full length on the ground. This is the Giant of the Hartz Mountains. The figure is perfect. For an instant the dreams of Homer are realized. There in very truth, is the Titan, and quite near may be troops of nymphs and Dryad girls. So perfect is the illusion that the beholder can hardly be made to realize that the giant is *himself*. The slant rays of the setting sun are so disposed by the surrounding hills as to throw his own image in mi-

raculous proportions, into the valley below him. Here let us find a figure of our work. The traveler is the boy—the giant, the man of the future. We see only the caprices of the boy—the future will see and feel the matured power of the giant. It is not the boy we are training, but the *giant*. In the freshness of morning, through the heat of noon, let us toil at our work, patient amid discouragements, charitable towards the thousand faults of boyhood, full of faith and hope and love, and as evening comes on, we shall see, athwart the far-stretching valleys of the future, which our own feet shall never tread, the image of the giant, and his name shall be Great Heart.

The President invited Hon. James B. Blake, mayor of the City of Worcester, ex-officio and personally a very important member of the Board of Trustees, to express the welcome of the city to the youngest public school established within its borders. Hon. Mr. Blake responded as follows:

Mr. President:—It is with mingled feelings of gratitude and pride that I rise to respond to your call to speak a word of salutation in behalf of our city; gratitude in the thought, that this school is the result of individual liberality, and pride, that by the generosity of our own citizens, its location is fixed within these precincts, and we are enabled to welcome it to-day to its place in that great educational structure, which has been established by the wise foresight of those gone before, is prized and sustained by the present, and to be cherished and continued through the coming time.

The character of a people is so forcibly and truthfully illustrated by the institutions established in their midst, that I consider the opening of this institute thus freely to our youth, a matter of public congratulation. In the ancient world, temples were erected to the heathen gods and consecrated by sensual rites and depressing sacrifices; amphitheatres were built, where beastly offerings were made 'mid the

exultant shouts of a grateful populace; and by the unrequited labor of thousands huge pyramids were constructed to immortalize the memory of kings long since forgotten; each typifying the civilization of its time; and because this school of special training is to typify and represent this people, and transmit to the generations yet to come, the sentiment and culture and enlightened liberality of the citizens of Worcester of to-day, I hail with peculiar pride the inception of an institution so free in all its opportunities, so broad in every department of useful learning, and so practical in its every detail of system.

I rejoice that the time has come when a good education must be practical and beneficent; and that education will be the best and most beneficent which shall be the most practical; an education which in its development of science and art and skillful application, must, as a result, dignify labor and lighten the burdens of toil; and I believe, Sir, that the school which attains the great desideratum of practical education will ever take rank among the noblest institutions of the age, and most fitly and fully answer the aspirations of democratic America.

The established basis of this school must, in its system, commend itself to the judgment of our people, and must likewise meet the wants of a large class in our community; and I deem it a matter of congratulation that while the directing power is vested in a board whose members are the embodiment of that large experience, culture and wisdom which is the crown of ripened age, and a guarantee of present stability and future success, the beginning of our Institute has been entrusted to young men; that this school, the ideas of whose foundation are to work out so much practical good in the years to come, is not to be tied or hampered by obsolete prejudices, but that young men, bringing to their work freshness of heart and energy of brain, are to impart learning, inspired by the magnetic currents of that enthusiasm which belongs alone to young life, and which, in its stimulating power, must give assurance of effective result

and positive, prosperous issues, making our institute a living power in her very youth. I would also heartily welcome the plan to be adopted here, which enables the student to select such a course of study as shall be suited to his taste and capabilities, and in a broad and liberal manner offers to the son of the poor the same advantages as one more highly favored, makes his special study the equal of any other study, and makes him the peer of any student.

Well may our community be proud of this institution which in conception and character is an anomoly in the state; no legislative grant or city appropriation is represented here, but these acres from street to street, this building from foundation stone to its highest turret, and the beautiful structure, its companion, with its furnishings and appurtenances, are the free-will offering and gift of the enlightened liberality of our own citizens; and the means by which these doors are forever to open so freely to our youth is the gift of one who has consecrated the accumulations of a long life of industry to this great enterprise; an enterprise which in its development will ever stand as a living monument of his generous benefactions, bearing the inscription of a grateful appreciation to be kept green and renewed by each passing generation. And while our city can point with pride to this institution of free learning, may the citizens ever remember with gratitude what history will faithfully record, the names of Boynton, Salisbury and Washburn as among its greatest benefactors.

By virtue of official position, in accordance with the terms of the gift, it has been my privilege for the past three years to attend the meetings of the trustees of the fund, and to know the pains-taking labor which has been rendered by the board, in the construction of this building and the detail of operation which necessarily precedes the establishment of such an institution. In justice, therefore, to the gentlemen of the board of Trustees, I desire to express, thus publicly, a due apppreciation of the voluntary service thus rendered, and in behalf of the citizens of Worcester to present to you their thanks.

Mr. President, let us heartily welcome the opening of this new avenue to learning, and may the blessing of Heaven give effect to its largest anticipations; and firm in the faith that the growth of practicable knowledge is attainable only through development of sound principles and pure morals, let us not doubt that by the liberality of the generous benefactors who have founded this institution, a light will be set upon this hill which will not be hid, but will be kindled and go forth from these walls, now dedicated to the Free Institute of Industrial Science, which will guide our children and our children's children in the path of intelligence and industry; that its fruits may be rich and abundant, ever meeting the highest interests of the whole community; and that here the tree of knowledge may never be dis-united from the tree of life, but by the union of theory and practice, cause and effect will be the complement and crown of this system of popular education, doing its full part in bearing up and sustaining an imperishable fabric of that truly practical knowledge which is the basis of all power.

To the board of trustees, to whom is committed the responsibility of direction and management of this institution, to the corps of teachers who may be selected to administer within these walls, and to all and every instrument and support, I would pledge you, in behalf of this municipality, its present and continued co-operation and interest.

At 1 o'clock P. M., the President stated that he was authorized by the ladies and gentlemen of Worcester, to request the invited guests and all friends of the Institute who were present, to enter the adjoining hall and partake of a collation. To accommodate this, there was a recess of one hour. In the central hall, after a blessing had been asked by Rev. Mr. Pervear, the company enjoyed an ample collation, as agreeable to the eye as the taste and enlivened by the conversation of the graceful and assiduous hosts.

At 2 P. M., the company returned to the chapel and the President read two letters, unexpectedly put into his hands. One was from Wm. D. Fenno, Esq., presenting a handsome Clock, manufactured by Howard. The other letter, from Messrs. Wood, Light & Co., offered one of their well known and superor Lathes of fifteen inch sweep and six feet long, for the use of the work-shop. These appropriate and valuable gifts from those who know and exhibit the advantages of a good mechanical education, were thankfully received as a great encouragement and aid to the school.

The President then introduced his Excellency, Governor Bullock, who spoke as follows:

Mr. President: — At this stage of the exercises it only remains for me to unite with others in congratulating the friends of the School of Industrial Science on having reached the degree of success which is expressed by these ceremonies of inauguration. Though the beneficent purposes of the school are yet to be accomplished, the liberality and vigor which have established these material foundations and superstructures, in accordance with plans so comprehensive, are a guaranty that no part of the original design shall fail for want of means or public spirit. In addition to the endowment furnished by the original founder, the amount contributed by others has been rarely if ever equaled in this section of the country in any similar undertaking and in an equal period of time. To the first donor, Mr. Boynton, and to all those citizens who have come forward to make his donation certain and successful, — of whom two, Mr. Salisbury and Mr. Washburn, ought to be especially mentioned and at all times remembered, — not only this particular community, but the people of the whole Commonwealth, are under lasting obligation.

The memory of great benefactions ought to be enduring. I sometimes think that our familiarity with the quickly accumulated fortunes, and the almost lavishment of benevolence of the last few years, has made us too insusceptible to the common duty of gratitude for the munificence which abounds in our community. Some of us remember with what sensation it was promulgated over the country, only a

little more than twenty years ago, that Mr. Abbott Lawrence had made a gift of fifty thousand dollars to establish the Scientific School at Cambridge. It happened to me, about that time, to be at the same hotel with him in the city of New York. It also occurred that the President of the United States was then present, on a visit to the metropolis. An intelligent and public spirited citizen of Tennessee came to me and said: "I desire to be introduced to Mr. Abbott Lawrence, of your State; for I would rather take the hand that can open with a donation of fifty thousand dollars in the cause of Education, than to shake hands with the President." And now here, in the retired abodes of the rural County of Worcester, we have three men, who have not been hunted out, but who have come forth of their own volition, each of whom have given for that noble cause a much larger sum than the one I have just mentioned. In cordial sympathy with the prayer of Dr. Sweetser, who opened the exercises of consecration this morning, we ought to be thankful to Him who is the disposer not only of events but of the hearts of men that produce events, that we live in a society were such things as these are performed.

The institution which we open for use, to-day, is a stage in advance of all considerable attempts which have been hitherto made, in Massachusetts, for the promotion of the study of what we call the natural and physical sciences. The first of such efforts resulted in the establishment of the Museum of Comparative Zoology, at Cambridge. Devoted to the study of the whole of living existence, of all orders of being, from man through every gradation to the feeblest vital organism that can be discovered, it is a monument to the interest which the State has manifested in one department of this general class of studies. It has been endowed with half a million of dollars, coming about equally from the public treasury and private citizens. In the hands of its great master, Mr. Agassiz—I am half inclined to call him the great magician of nature—it is helping into world-wide fame not only him but the Commonwealth of his adoption.

But in many particulars that is a school of abstract study, as distinguished from that which is palpably practical and in immediate relation with the producing powers and capacities of men. The two only other leading institutions we have in the domain of physical science — the Scientific School of Harvard University and the Institute of Technology at Boston—have aimed to supply this deficiency by bringing what are termed the useful arts into profound study and direct application to the social progress of our time. Of the Institute of Technology I have a high appreciation. In my judgment it aims to meet the exigencies of this age with a broader scope than any other institution that has been established in the United States. Passing through its rooms, witnessing the facilities appropriated to the pursuit of mathematics, design and drawing, descending to the laboratory and beholding the young men applying their own thought to actual experiment with the free use of water, steam and gas light, all the elements and all the apparatus, any man in the visit of an hour must be satisfied that an advanced position not realized before has been attained in the ever widening field of education. But the school whose doors are now thrown open to swing free on this eminence, is designed, as I suppose, to be devoted not less than the Boston institute, to the elementary studies which precede, accompany and stimulate the development of the useful arts, while besides it comprises the department of practical mechanism which has not as yet been attached to the former. That, I apprehend, may be found to be the right arm of this institution. Here is a building which is dedicated to the pursuit of the wonder-working forces and agencies of mechanic art, and which is to be supplied with the conveniences, and, so to speak, with the temptations that shall entice the thought, ingenuity, taste and aptitude of a young man into acquaintance with the processes which distinguish, as characteristics, this mechanical age in which we live. Here we are to have not only the abstract instruction—the research, reflection and contemplation of the stu-

dent, ranging over all authorities and theories in the broad field of mechanical powers and combinations—but we are to have also the illustration at hand—the thing of beauty, as it lay in the imagination, is to be wrought out before the eye of the student and by his own fingers—the golden chain is here connecting theory with practice, to find which so many men in all the callings of industry have passed years of time between the school of their study and the shop of their success. He was a wise man who connected this department with the institution; and he is the generous benefactor who supplies and supports it.

Mr. President, this school comes to us at the right time, but none too soon, in aid and furtherance of the drift of our civilization. Intelligence, acting through the useful arts, is the vital principle of modern civilized society. The mechanician is now master of the situation. Those communities are now foremost in wealth, in culture and in all the methods of moral influence, which are foremost in the development and use of the arts. They conquer in war, and they rule in time of peace. According to statements made by approved English writers several years ago, and making proper allowance for the increase since, the spinning machinery of Great Britain, tended perhaps by three or four hundred thousand workmen, produces more yarn than could have been produced by four times the entire population of the kingdom if using the one thread wheel; and the amount of work now performed by machinery in England is probably equivalent to that of the whole population of the globe if performed by direct labor. Striking and almost incredible as such statements appear, they are at this moment measurably in process of reproduction in some of the States of New England, and in none more conspicuously than in our own State. According to the last official tables of our industry, published two years since, the annual product of values in Massachusetts was more than seven hundred million dollars—or nearly two and a half millions for every working day in the year. I allow something for the infla-

tion of war values, but any excess from that source is probably not greater than the amount of production overlooked in making the returns, and therefore I take the footing to be a fair one. Now I need not say that this quickening and awakening of the industries—this type of the modern civilization—comes in a great proportion from intelligence working by machinery. It is the intellect, the reason, the thought, the imagination, the taste of our men, and of our women as well, working through the thousand-handed engineries and agencies which the God of nature has placed in their control and inspired them to employ. Our own city of Worcester is a remarkable example of the improvement in these arts. Having had some opportunities for making the comparison, I can in all sincerity declare that I do not know the community in this country which leads a more busy, intelligent and happy life. I do not know what the papers of the Patent Office Department at Washington, might show, but it has occurred to me frequeutly, reading the current lists of patented inventions, that, with the exception of four or five of the very large cities, not another in the United States receives in the course of a year a larger number of letters patent than this inland town of forty thousand souls. The genius of the place seems inspired for the mission of the arts. The mind of the population seems aroused and exalted in the pursuit of the greatest attainable improvement in the condition of mankind.

Now, Mr. President, we have only to take the modern situation as we find it—a people "pushing things," as the phrase now is, not so much by arms, as by arts—carrying their conquests over the globe by their wits—and to apply ourselves to the duties of furnishing the best education which this popular condition requires. We have reached a definite and established status, as a Commonwealth, for which specific policies and adaptations of education must be amply provided. And this work of public obligation has only begun. In the five chartered lite-

rary colleges of the State there are, I suppose, some ten or twelve hundred students. But with the exception of very few who will take to engineering scarcely any of this large number will apply and continue their study and culture in those pursuits to which I have alluded and which constitute the texture and fabric of our social organization and power. The two institutions, which I have before mentioned, are instructing probably less than two hundred and fifty of our young men. The school which we dedicate to-day ought speedily to double this number. The want is imminent. The condition which has produced the want has been advancing upon us with rapid stride during the last thirty years. The whole social organism, all the forces and activities, the spirit of our age, the life of the State, are flowing in channels which, a generation ago, were too feeble to awaken the public attention. But it is so no longer. The directors and masters of education, the patrons and benefactors of our time, have been aroused to an appreciation of the necessity. That which is needed is not an under-estimating or depreciation of the schools of classical learning. Theses and addresses have been published in the last few years which have discussed the benefits received from the colleges in a manner most unwise and unfair. And in my judgment he is not in proper accord with the temper of this era, any more than with the temper of the past, who misleads the intelligence of the people by teaching them to undervalue the higher seminaries of classical learning. They will still live and prosper, and enrich the parish, the town, the halls of justice and legislation, all the circles of life and all the classes of mankind, with their myriad shaded attainment and culture, their rich and exalted thought drawn from the treasuries of past centuries, their flexible taste, their refined sentiment, their trained virtue and their imperishable religion. Let no man assail the colleges of Massachusetts. Their field is the world. But there is quite as much space left for the schools of industrial and physical science as they can occupy. We must maintain them be-

side and in addition to the others; we must support them for the specialties of our active, producing, consuming civilization. In sympathy with the objects of those other seminaries they should have in common with the others the base of the same Christian religion which has upheld them; the same patriotic tone and purpose; the same elementary studies which precede and prepare for the classification of men in the various occupations of life. Beyond these things, they are designed to educate—in the literal signification of that word, to lead forth, to bring out the inventive genius of our young men. From the great invention of James Watt, which has changed the whole face of society, down through the long line of inventions now innumerable but all working together in the vast complication of the world's industry, you find comparatively few which have proceded from the sons of universities. They have cropped out from humble cottages and secluded garrets. There have been in times past no schools for this class of producers and benefactors. Here we have the school at length; and all around us, in the midst of us, we have the material for crowding its seats. In the application of elementary mathematics to practical art; in the broad department of design and drawing; in facilities for enabling the student to seize each happy thought as it crosses his imagination and to chain it in captivity by his own senses and by the agencies of fire, steam, electricity and all the metals which minister in his hands; in mutual comparisons and suggestions among kindred minds laboring side by side in the common work-shop of nature; in the stimulation which shall here be communicated to the illimitable capacity of the mind, for modifying, improving, enlarging, intensifying all discoveries yet made in the realm of utilized skill and art; in sending forth, one after another, great and small, new forms and combinations which shall facilitate and cheapen the ways of life, from the work of the engine that traverses the sea, or keeps a thousand men and women at work under a single roof, to the humblest cooking of a cot-

tage dinner; in simplifying and saving labor by devising new modes of dividing it; in pointing out new uses of economy in the working operations of the mechanical forces, wasting less and consuming less without profit; in producing the most benign effects on the moral and social relations by material means, raising the standard of comfortable living, increasing the quantity of leisure time for mental improvement, and promoting the progress of man in all the fields of earthly service and enjoyment—this school and its associate schools shall contribute their part in perpetuating for our Commonwealth the respect and blessing of all wherever freedom and intelligence exist. And I deem it a privilege to be permitted to unite with you in committing it to its work, and in commending it to the patronage of our fellow-citizens and to the favor of Divine Providence.

The President alluded to the regret that would be felt that Mr. John Boynton and Mr. Ichabod Washburn, the founders of the two departments of the school, the scientific and the mechanical, were not permitted to be here to-day. Mr. Boynton died on the 25th of March, 1867, and the health of Mr. Washburn is not now strong enough to endure the fatigue of attending these exercises. In the absence of these benefactors it was pleasant to call on their friends who knew their purposes and had been consulted as to their accomplishment. As one of their friends the President introduced Rev. Dr. Sweetser, who spoke as follows:

In the month of January, 1865, Mr. David Whitcomb intimated to me that a friend of his, whose name he could not mention, desired to appropriate to some useful and benevolent purpose the sum of one hundred thousand dollars. He wished to be advised as to the object and the best method of bestowing this sum of money. He had determined to seek the counsel of Hon. Emory Washburn, and at Mr. Whitcomb's suggestion, I was requested to act with Mr. Washburn. The subject was submitted to us in a very indefinite form, the only direction given being that the money should be devoted to the promotion of education in the County of Worcester. The leading idea communicated to

us was that the donor wished to make the avails of his industry a permanent means of aiding the young in obtaining advantages and privileges in preparing for active life which had been beyond his reach. He desired to be advised in regard to the form and method by which he might most successfully secure his chosen object. The matter was immediately taken in hand, and Mr. Washburn and myself had several interviews and consultations, in some of which Mr. Whitcomb was present, to represent the donor. The design was laid before President Hill, of Harvard College, by Mr. Washburn, and his suggestions received. A very full interview was had by us with Hon. Joseph White, Secretary of the Board of Education, in his rooms in Boston, in which the general plan of an educational institution for practical instruction was discussed.

It was especially enjoined upon us to take every precaution against the waste or perversion of the fund; to guard it against ever becoming an instrument of sectarianism, and so to arrange the whole as to accomplish by it the desire of the donor to bestow a generous gift upon the community for the benefit of coming generations.

It was stipulated that the Institution should be located in the city of Worcester, provided that land and money sufficient for erecting suitable buildings, should be seasonably contributed by the inhabitants. Otherwise it was understood that suggestions had already been made which would determine the bestowment of the benefaction in another direction. Upon these instructions the plan of the institution, substantially as it has been incorporated, was drawn up and received the approbation of the donor, and was by him adopted and made a legal instrument by his signature.

These several steps occupied much time, and it was not until the 6th of March that a letter was directed to gentlemen in the city of Worcester, informing them of the proposition to establish such an institution here. About thirty gentlemen were addressed, and after favorable re-

sponses had been received, a meeting was called at the office of Mr. Hoar, where the subject was more fully presented and a subscription paper opened, commencing with many generous contributions, and resulting, as is well known, in raising the necessary fund for the erection of the building. Subsequently several propositions were made of land for a site, the most appropriate and generous of which was that of the lot upon which the buildings stand.

As soon as circumstances warranted, an act of incorporation was applied for and obtained, and the Worcester County Free Institute of Industrial Science had a legal and corporate existence. Up to about this period the name of the munificent public benefactor had been withheld from the community by his special desire, but was at length announced as John Boynton, Esq., of Athol, formerly of Templeton. It is not necessary that I should go into further detail in regard to the progress of the undertaking. The facts have already been with carefulness and accuracy presented to you. But there is one circumstance which I think should be recorded in honor of the magnanimity as well as the public spirit of one of the munificent and most devoted patrons of this enterprise.

The morning after the issue of letters to citizens of Worcester, Hon. Ichabod Washburn called to converse in reference to the subject of the communication. He stated that he had not made up his mind in reference to the proposition, but must take time to think of it. He could not say whether he would give aid to the plan or not. I saw at once that he was much disturbed, and I readily conjectured the cause. Eight or ten years before this time we had conversed together in regard to the great need there was of a school for the scientific education of mechanics. He had experienced many difficulties and hindrances in his business on account of not having had instruction in the fundamental principles of Mechanics and Chemistry. He thought a school might be established in connection with the Mechanics' Association for giving such instruction, and that

funds for the purpose could be easily procured among the prosperous mechanics and manufacturers of Worcester. At his request I drew up a plan for such a School, which was submitted to President Sears, of Brown University, formerly Secretary of the Board of Education in this State, and, I believe, to some other gentlemen. The subject was proposed to individuals in the city, who looked upon it favorably. But before any thing effectual was done a financial crisis occurred, that rendered the procuring of money for the undertaking hopeless, and the project was suspended.

This project Mr. Washburn designed to carry out by devoting to it a portion of his own property; and the occasion of his hesitancy was whether he should abandon his cherished design of being the founder of such an Institution, and come in to aid an effort already commenced by an unknown individual. The result you all know. Magnanimity and generosity prevailed, and Mr. Washburn decided to adopt this Institution as the object of his bounty, and to bestow his munificent appropriations in aid of its establishment.

The plan submitted to him contained the leading features of the plan of this Institution. The experience and the practical mind of Mr. Washburn led him to give prominence to the Machine Shop as an invaluable part of the arrangement. And this idea he secured by proposing at once to erect and equip a shop, in connection with the Institute, at his own expense. His interest has also been manifested in securing to the corporation fifty thousand dollars, to be paid at a future day, the interest of which is immediately available in aid of the mechanical department, and as a means of assistance to deserving apprentices whose circumstances require it.

This brief statement will serve to show how this design originated and has been brought to its present auspicious condition. Two industrious and prosperous mechanics, having, independently of each other, cherished the purpose of being the benefactors of this community in future years,

were, in the Providence of God, brought to combine their means and to co-operate together in laying the foundation of a school of practical science, which, we trust, will prove not only an ornament to the city, but a long-continued source of substantial benefit to the country and the commonwealth. And they, with the citizens of Worcester, whose contributions secured the location of the institute amongst us, and whose gifts and efforts have increased the funds to an amount already so encouraging and substantial, will well deserve the encomiums and the grateful remembrance of posterity.

The President welcomed the presence of Professor William P. Atkinson, of the Massachusetts Institute of Technology, a school whose success is a guide and an encouragement in the course which is here undertaken, and invited Prof. Atkinson to address the company. Prof. Atkinson said:

Mr. President, and Ladies and Gentlemen:

I am taken by surprise by the call upon me to address you, as I had no expectation when I came up here of being anything more than a listener on this interesting occasion; and I cannot but regret that indisposition and the inclemency of the weather have prevented our Institution from being represented here to-day, as it could have been so much more ably and worthily, by our respected President. I cannot, however, refuse your invitation, Sir, to say a word to this audience, and to hold out, as I do most cordially and heartily, the right hand of fellowship to this new Institution, in behalf of the sister Institution with which I have the honor of being connected. Founded for similar objects, and anticipating you but a very little while in a similar educational experiment, it is a pleasure and a satisfaction to welcome so soon, and under such happy auspices, these new laborers in the wide and inexhaustible field which lies open before us. There is no fear that in that field there will be too many laborers. Not if from some commanding emi-

nence such a school as this looked down upon every city in our land, would there be any danger that the advantages of an education like that here offered to the youth of Worcester, would be too widely spread, or furnished in too lavish abundance.

You will not expect me, Sir, to go over again the ground so ably traversed by the speakers of the morning. Let me only say, differing as I may from them in particulars, how cordially I agree with the main doctrines laid down in the addresses. It has long been my conviction that the jealousy shown in many quarters in regard to that extended study of physical science which characterizes these modern times, as if it were hostile to religion, is idle and absurd. The deeper study of the laws that govern Creation lead men to doubt of a Creator! To state such a doctrine is to refute it. To be a Student of Science, is to be a loyal adherent of Truth, wherever it may lead, and I will never believe that the genuine effect of the pursuit of truth, as unfolded in the laws that govern the material Universe, can be to falsify the testimony of all that is deepest in man's spiritual nature. The world of matter and the world of spirit cannot so contradict each other.

Neither do I any more believe, Sir, in that antagonism which in some quarters has sprung up between the adherents of literature, on the one hand, and those of science on the other, considered in the light of instruments of education. There can be no real antagonism between them. You might as well ask, if I may use the homely illustration, which is the better half of a pair of scissors, as ask which is better, literature *or* science in education. I have a right to speak on this point, Sir, for I am a teacher of literature in a school of science, and not a day passes but what, in my intercourse with my students, I am made to feel the absolute necessity of the literary element in a scientific education, just as I believe that the absence of the scientific element from a literary education is what has heretofore struck so much of it with barrenness and blight. Both are

needful, Sir, and one as needful as the other, to a true and symmetrical development of the mind. The discovery which marks the education of modern time is this—that they may be mingled in more than one proportion. The expanding wants of modern society, the varied employments of modern life, and that vast expansion of modern physical science which accompanies and renders them possible, have wholly altered the relations which different mental pursuits bear to each other. On the one hand new and vast fields of thought have come into view, unknown to the thinkers of ancient times, and on the other, the occupations based upon them have risen in dignity and importance; and for these, new educational instrumentalities must be provided. In this free country where we believe in men as men, and not in the superiority of classes, and where all honest labor is honored, we look to see the time when *all* true educations shall be counted equally "liberal," and a liberally educated merchant or a liberally educated mechanic, or chemist, or farmer, or engineer, shall be counted no more of a phenomenon than a liberally educated physician, clergyman or lawyer. For that end we must multiply and we must *vary* our schools, and the old monopoly of one narrow and antiquated curriculum must give way to the ever expanding wants of modern civilization. But it does not follow that the scholar's liberal education is to cease because the practical man's liberal education has begun, or because science has been neglected in the past, that therefore literature and language are to be neglected in the future. Rather do I expect to see the study of language and literature itself gather new life from the impulse given it through the spirit of modern scientific methods.

And let me say here how cordially I endorse the doctrine laid down by Prof. Woodman, that the course of study of these new schools must be no less thorough and disciplinary than that of the old, and that on this point we must stoutly withstand that popular prejudice which looks upon such schools as mere shops where a boy can go to be equipped

with an outfit of empirical experience for the pursuit of some bread-winning employment. No technical education is good that is not firmly based upon a foundation of scientific principles, well learned and thoroughly digested, and no Scientific School is worthy of the name, that does not give an education whose *disciplinary* value shall be equal to that of any other training. As the pioneers in this movement, it must be our task to withstand the popular prejudice on this subject, until experience shall show, as it surely will, that a true scientific education is equal to any other in true dignity and value.

You will expect me, I know, Sir, to give some report of the success of that experiment, resembling your own in so many features, in which we are engaged in Boston. Less than four years ago the Massachusetts Institute of Technology began with a small class of young men, in hired rooms, in Summer street. Last June, sixteen of those young men graduated from the stately building which is now the home of the Institute, and before the vacation was over every one of them was in active employment in his profession; and a month ago seventy-six new students, of the average age of seventeen and a half years, were admitted to complete the full number of classes. The Institute now numbers one hundred and seventy-two pupils. We have not blown any trumpets, Sir. We did not need to do so, even if we had been inclined. But we thought that the best advertisement of ourselves would be successive classes of well-instructed students, prepared to do faithful work, each in his chosen calling. If we turn out engineers whose bridges tumble down, we must tumble down; if their bridges stand, we also hope to stand. At first I believe the public adopted the idea that we were to serve as a sort of hospital for incurables, where young men, not quite clever enough to profit by a real education, might come to get what modicum they could of an inferior sort of training. I believe the public will not be long of that mind, but will find that there is as much room in a scientific school for the thorough and

manly training of the faculties as in any other institution of learning. And in regard to the Institute of Technology in particular, I believe the impression is beginning to prevail that it is easier for a lazy fellow to get into it than to *stay* in it. So it must be, Sir, if science is to claim her rights as a leading element in the education of the future. We must not accept for her the servile office which a low utilitarian philosophy is too ready to assign. We must be jealous of her dignity, and by maintaining a high standard, and teaching by none but truly philosophic ways, must show that her power of developing the mind is not less than that of any other instrumentality. It is well developed scientific minds that we must produce, not empirics, equipped with a little practical dexterity.

I have said that Literature cannot be neglected. The modern science of Comparative Philology is fast revolutionizing the methods of linguistic teaching, and the rich literatures of modern languages have entirely changed the relation of the ancient classics to modern education. The world owes the latter a vast debt, and they remain as beautiful as ever, but they can never again be what they once were, the sole instruments of linguistic training. A scientific man may well afford to be ignorant of Greek, for he has no time to study it. He can *not* afford to be ignorant of French or German, and he should be ashamed to be ignorant of his mother tongue and its noble literature. He too is a citizen of a free country, called to take a part in the government under which he lives, and, if that country is to remain free, it can only be by all its citizens understanding the great principles of justice and right which underlie all free constitutions; and living in a day and generation where the great problems which agitate men's minds are social and economic problems, he is not properly educated unless he knows something of social and economic laws. There is no fear, Sir, but literary subjects enough may be found to claim the attention of every scientific student, and our friends who have charge of the instruction of this school will have to do a great deal

of hard thinking before they can arrive at that proper balance and adjustment of the various studies most suitable to the wants and capacities of the pupils in their charge.

Because I believe, as a student of educational subjects, that such movements as the one here inaugurated, to-day, are in the direction clearly pointed out by the movement of the times and the pressing demands of this new nation, I look to see an influence from them that shall extend far beyond the walls of any particular institution, and re-act with powerful effect upon the whole education of the country. The public school system of this country is the noblest in its general plan that was ever devised by any age or any nation; but I think that no one who has had occasion to examine it in its present stage of development can say that it is yet adequate to meet the real wants of the people. Common schools are the corner-stone of our free institutions, our chief safeguard against that anarchy and lawlessness which are everywhere and in all times the companions of ignorance. Now the character of the elementary schools is largely influenced by that of the higher institutions of learning. From the university and the college and the scientific school, the light of knowledge radiates to the humblest primary school in the remotest village. Far be it from me to depreciate the debt we owe our colleges — yet I cannot help saying that I think our common schools at this moment are in need of a new impulse to make them what they ought to be; and without detriment to anything good the past has left us, I look to see that impulse come from the extended study of physical and social science. The great problems of this day are not the same as the problems of the past. Religion is not dying out of men's minds as foolish men imagine—religion can *never* die—but religion is taking on itself new forms, as it ever does from generation to generation—and to meet the highest *moral* and *spiritual* as well as the material demands of these new times and this new nation, there have been placed in our hands the vast and wonderful discoveries of modern physical science. Let us not

foolishly mistrust them or reject them — let us rather reverently and wisely use them, to serve *all* the highest purposes of humanity.

Let me close, Sir, as I began, by offering to you and this audience my hearty congratulations on the auspicious commencement of this new institution; and in behalf of the Massachusetts Institute of Technology, older, and yet but a little older than you are, let me cordially offer all the assistance and co-operation it may be in its power to give.

The President slightly alluded to the direct and indirect aid of the old classics in the active business of life, and introduced Mr. Thomas A. Thacher, Professor of the Latin Language and Literature at Yale College, who spoke as follows:

Mr. President:—I desire to thank the committee of arrangements for having invited me to be present at this very interesting inauguration; but I regret that some one better qualified than I am, is not summoned to respond to this particular call. Indeed, my own feeling has been, I may say, as I have entered into the pleasantness of these exercises, that this was an occasion when Greek and Latin should, in the language of President Johnson, "take back seats." It emboldens me, however, somewhat, to call to mind that it was a very good writer of Latin, who, many centuries ago, suggested that there was a certain *commune vinculum* which unites all the various branches of human knowledge. And from this it follows, if Cicero may be referred to as an authority to-day, that this "common bond" makes us all one, however various may be the sciences to the cultivation of which we have been severally assigned. From this theory it also follows that it is for the advantage of every science that every other be cultivated—that the success of one confers a measure of success on all the others, and that if one member of the whole body of sciences suffer from neglect, or contempt, or in any other way, all the members must more or less suffer with it.

That friend of classical education, therefore, who is jealous of the progress of the natural sciences or of the prosperity of scientific schools, greatly errs; for he may be sure that such progress and prosperity will, sooner or later, bring advantage to his own cherished province also. Is not this result already sufficiently indicated by the facts of experience? Scientific schools have, for twenty years, been in successful operation in Harvard University and Yale College. But while they have been advancing to strength and independence, steadily winning the public favor, the regular college classes, instead of diminishing, have been growing to unprecedented numbers, until the freshman classes in these institutions, this year, contain one hundred and seventy-five candidates for degrees in arts.

And what is said of the unity of human knowledge is also true of our system of education. Indeed, the very phraseology we use indicates this. A system is a unit, and if all the departments of education are but parts of a grand whole, then, certainly, it is essential to the well-being of the whole that no one of the parts be neglected, or dwarfed, or fail in any way of its full development. Taking, then, a liberal and broad view, we may rejoice, unfeignedly, in every sign of true progress in every department of education, in the improved methods of primary instruction which may be observed in the little red district school house, as well as in the advances which science is making in the oldest universities. Certainly, then, I can rejoice with you, Sir, as I do heartily rejoice, in the opening of this new institution, which the generous beneficence of a few citizens has today given to the public. And I cannot forbear to utter, in this connection, the thought which presented itself to my mind as I listened to the chapter of generosity which was read to us this morning. It is this: that every such gift is double. First, then, is the material wealth, which passes from private to public ownership, and then the donor himself, by his very act, makes himself one of the choicest items of the public wealth. For are not eminent citizens,

those who are eminent for their devotion to the public interests and the sacrifices they make to promote them, to be counted up as the jewels of the state and its substantial pride? And do they not enter as most important elements into the power of the community, that complex power which gives shape and character to each successive generation as it comes on to fill its place of responsibility? These names, Sir, will not die; they will be worth too much to be lost.

But to return, Mr. Chairman, to the subject for which you called me to the platform, I would respectfully dissent from an opinion contained in one of the interesting addresses of this morning, that it is the object of a classical education to teach a man "how to express himself." I would claim rather that the object is so to train and discipline his mind that he shall have something to express. I hold that the great design of education is to teach men to think, to transform undisciplined, unthinking boys and girls into thoughtful, intellectually matured men and women. This great result the schools accomplish by requiring of their pupils careful and discriminating thought, day by day—not always difficult thought, but yet, on the whole, of increasing difficulty to them as they pass on from one stage of their education to another. And then the more varied and diverse the objects and subjects to which thought is wisely directed in the acquisition of knowledge, the more likely will the educated youth be to have the versatility and aptitude as well as strength of mind which shall fit him to be equal to any situation which he may be called to fill. Youth held by good teachers to the practice of considerate thinking on worthy subjects, through the years which should be devoted to education, will no longer be children in any sense when they shall have arrived at the stature of manhood and womanhood.

For this indispensable mental training no material seems to me better than the classical languages, combined as they usually are, with a considerable portion of pure mathemat-

ics—no emery better for polishing and furbishing the human intellect than Latin and Greek. Does not this very county and this State furnish evidence that a regular college education does not, to say the least, render a man unfit for eminent success in the mechanic arts and the application of science to the instruments of civilization? * Eli Whitney, who went from the neighboring town of Westborough to Yale College, eighty years ago, and graduated in the year 1792, and made, in the invention of the cotton gin, one of the most important practical contributions to industrial mechanics, which the world has ever received. If cotton ever was king, even for a day, he received his sceptre from a Worcester County youth, whose wits had been sharpened by a regular course of Greek, Latin, mathematics and logic in a New England college.

About twenty years later, Findley Morse—his whole name, I am sorry to say, is too long for household use—went from another town in Eastern Massachusetts to follow the same course of collegiate training; and the world may be challenged to show a more brilliant and useful application of science than he made in demonstrating the feasibility of a magnetic telegraph.

But, Sir, it is not a degree from a college which makes or unmakes a man. It is good training, wherever obtained. And this seems to be the prevailing opinion in your commonwealth, as I judge, from the somewhat careful observation of your public education, to which I have been called during the last three or four years. I am sure you have discovered a most important secret; that you have found out that the most valuable item of wealth in a State is not its gold, or its silver, or its houses, or its acres, but its citizens—its men and women; and that the one way of increas-

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*These illustrations of the preceding thought occurred to the speaker after the Chairman informed him that he might be called on for a word, but he did not utter them, lest he might seem to press his subject too much. He hopes, however, that it may not be taken amiss, if he makes them a part of his desultory and poorly remembered remarks.

ing this crowning wealth of a State is by the varied processes of education. For what makes the difference in value between the influential citizen and his own servant but the long continued intellectual, and moral, and physical culture which has been the lot of the former? How vast an aggregate of wealth, then, is secured to the State when only the elements of education are secured to each child within its borders. Much more when schools for advanced education, high schools and graded schools are established in every town, open to the free use of all the children and youth. In this wise view of the value of universal education, and of education of every grade and in all the varied applications of knowledge, I fear you have left Connecticut behind. But we are profiting by your progress. We have carried off some spoils from your borders after repeated menacing inroads, and it is to be hoped that we shall yet overtake you in this good rivalry. But it must be confessed that the establishing of this Institute, so complete in all its parts and so wisely comprehensive in its plan, increases the difficulty of our task.

The President then introduced Hon. Emory Washburn, a trustee by appointment of the Board of Education, and though not a relative of Hon. Ichabod Washburn, a friend and a counsellor of him, and also of Mr. Boynton, in relation to the arrangements of this Institution. In his response—

Mr. Washburn complained that the President, by calling upon him to speak on this occasion, had broken the contract under which he had come there, and he felt that he owed it to himself to protest against being obliged to tax so severely, as he must, the indulgence of the audience, by attempting to address them after the rich treat which had been offered by those who had preceded him. There was, however, a conflict in his feelings lest, if he kept silent, he might seem to be indifferent to the dignity and importance of the occasion which had drawn them together. He would not conceal, if he could, the high satisfaction he felt in having

his own name associated, even in a humble and subordinate relation, with the enterprise which they were met to inaugurate.

In such a presence, and amidst the surroundings on which the eye rested as it looked out from the beautiful spot where they were gathered, he could not fail to pay homage to the genius of mechanism and the spirit of enterprise that had changed the rural village to which he had come in his early manhood, into a city of nearly forty thousand busy, thriving people, and had covered these hills with the abodes of elegance and luxury. This had been chiefly the work of mechanical industry and skill, and he could not forbear, on coming back to what had been his pleasant home for so many years, to congratulate those who still dwelt here, upon the prosperity which they witnessed on every side, and on this new element of success which was this day dedicated to the advancement of the young men of the city.

To every word which had been so well said by those who had preceded him, he had only to express his hearty assent, and nothing remained for him to add in respect to the character or purposes of the Institution. But while he had listened to these eloquent and pertinent addresses, one view of the subject had occurred to his mind, which, it seemed to him, had not been sufficiently considered. And, although it might seem to some minds to partake less of dignity and importance than the considerations which had been urged, he would venture to bring it to their attention, although he might do so at the hazard of being thought to be dealing with mere common-place facts and homely illustrations. The Institution which commenced its operations here to-day, was indeed a monument of far-seeing sagacity and munificence, which will forever do honor to the men who have become its benefactors. But it was not to be concealed that it was still imperfect in the completeness of its appointments, its apparatus and its corps of teachers. So far as they had gone, every thing was satisfactory. But many things were still needed. Besides, with the growing

demand in the county for such instruction as this school is designed to impart, the school must itself be enlarged and its facilities increased. And as every thing thus far had been the results of private liberality, on the part of gentlemen in the county, the school must look to a like liberality on that of the mechanics and manufacturers who were to be the most directly benefited, to meet their wants and to make it what it should be. And here he wished to impress upon the minds of the people of the county, that they were personally and directly interested in the success of this enterprise. Every parent, no matter how poor or humble he may be, if he has a son to educate and start in life, has a direct interest in maintaining an Institution which is open to all, free of charge, and does what it can to aid every one who comes to share its benefits, without regard to birth or condition in life. So it is with every young man who is seeking an opportunity to fit himself to earn a competence in any of the departments of honest industry. And the same is true of the manufacturers and master mechanics in the county themselves, who employ the labor and skill of the workman. This school is for their benefit also. And in saying this he was but repeating the views of the gentlemen who had done so much in founding it. Take the case, for illustration, of a young man who after having shared the benefits of the common school, goes into a shop as an apprentice to learn the trade of a mechanic. He has not been taught the laws of mechanism, the nature and properties of metals, or the processes by which an end is to be reached, which helps to make so large a part of the trade he is to learn. People are misled by high-sounding terms, and it might seem to be idle to talk about teaching such a young man to understand *science*. There is something in the very word *science* which seems to put it out of the reach or comprehension of common minds. And so the apprentice goes on, month after month, in doing a thing over and over again, till, by repetition, he is able to do it well. And he would be surprised to be told that the formida-

ble something which folks call science, is, in his case, simply knowing *how to do the thing*. It is finding out by repeated experiments what the law or rule is, by which an end sought, may be reached or accomplished. Now, could he have been taught this as a part of his preparatory education at school; could he have been taught the mechanical powers, the properties of matter, the effect of chemical or mechanical combinations; before he entered the shop or the dye house, he would have been spared this waste of time in trials or experiments, and have been ready, at once, to be profitable to his employer as well as useful to himself. And the employer, too, would be relieved from that waste which every mechanic and manufacturer suffers from incompetent and unskillful workmen and apprentices, by the breakage of tools, damage to materials, and the bad character of work done. So palpable is this that it would not be difficult to show its truth by something like an accurate computation. If he was right in his recollection of the products of mechanical labor in Worcester County, in 1865, it might be estimated at $25,000,000. This shows not only how deep a stake the men of the county have in whatever favors their productive industry, but it shows, at the same time, their ability to lend aid to whatever could do this. There are, he had reason to believe, at least twenty thousand persons employed in the mechanical and manufacturing operations in the county. The average active life of these cannot be set down at more than twenty years. So that, at least, a thousand new operatives come into the business every year. Now, if half a year could be practically saved and thus added to the capacity and skill of these young men, by a previous preparation, it would be adding five hundred years work, in the aggregate of a skilled mechanic, to the power of production; or, to state it in another form, the work of five hundred men to the profitable industry of the county, and increase, to that extent, the convertible resources of her industrial classes. Nor is that all. The difference between educated and uneducated labor is not to

be measured by mere dollars and cents. The advantage of the education which our operatives already receive from our common schools, is illustrated in the difference which is witnessed, every day, between the workman in the English shops and our own. There the apprentice learns some one department of a trade, and is content to confine himself to that alone. He goes through the same operations till he becomes as much a machine as the loom or spinning frame which he tends. A traveler had told him that when he visited a manufactory of shawls in Paisley, he found a man weaving the borders, and upon asking him how or by whom these borders were attached to the body of the shawl, he was answered that "he never inquired, he supposed it was done in some of the upper rooms, and that was all he could tell about it." In what shop in this country would such a thing be true of a Yankee operative? When one of the Lowell companies began to print their goods, they sent for a competent head of their works to England. He brought with him workmen skilled in the various processes, but being in want of others he employed a number of Yankee hands, putting some of them to work upon one of the processes and some upon another. In less than a year, he was astonished by a request from one of these to be transferred from one part of the work to another. He was still more puzzled when, to his inquiry, this operative admitted that he had nothing to complain of in the work he had been doing; and he pressed him for a reason why he wanted to change. "Do you suppose," said the operative, "that I am going to stay in that room all my days? You hired me to work in your print works, and I expect to understand what printing is before I get through." And, said the superintendent, in giving an account of his first experience with raw Yankees, "these men had not been there three years before they knew how to do every part of the work." In another similar establishment, with which he was acquainted, the head of the dyeing department, counting upon his superior skill and experience, and believing that these could

not be supplied without great difficulty, became so exorbitant in his demands, that his employers refused to comply with them, and he left the work. The head man in the repair shop, who had never served any apprenticeship to the business of a dyer, but had had his natural good sense and mother wit cultivated by education and habits of observation, was put into the place which had been thus vacated, and in a very few weeks his employers found they had actually gained by the exchange. He did not, however, want any better illustration of what might be accomplished by native good sense, cultivated by education and disciplined by observation, when aided by experience and sustained by good judgment and strong resolution, than might be seen in the history of one of the founders of this institution. He had learned the trade of a mechanic, as an apprentice, in a neighboring town. While thus employed, there was nothing to mark him beyond the same unpretentious qualities which have distinguished him ever since—diligence, fidelity to duty, an unblemished life and a steady resolve to improve himself and deserve the confidence of others. After completing his apprenticeship, he came to Worcester, and, after several years, engaged in a manufacture which he had built up by his own enterprise, and in which he has attained an excellence that is not surpassed by any manufacturer in the world. Yet though he had in this way risen to the possession of wealth, and an enviable position of respect and social influence in this community, it was only after repeated efforts and failures in his endeavors to attain to the requisite skill, that he was able to deduce the true laws of science in the manufacture in which he was engaged, from the experiments which he had made and the inferences derived from his own reasoning and observation. To do this, however, involved the loss of time and money, and the depression of repeated disappointments which would have disheartened a less resolute nature, until, at last, he triumphed in a complete success. Now no one need be told that if, instead of this, he could have had some

competent teacher to sit down and detail to him, before he had begun, the several processes by which he now transforms the metal, in its primitive state, to the perfect article which finds its way to every market, he would have been spared this waste of time and money, and the tax upon his nervous energy which it had cost him to be his own teacher.

And it was one of the strong motives, on the part of that gentleman, in contributing so liberally towards the establishment of this institution, to save the young men, who should come after him, from the disappointments, the perplexity and discouragement which he had to encounter and overcome before attaining that skill and science in his business which were now bringing their reward. It was his own experience that first suggested to him what that want was which he has now done so much to supply.

He could not, therefore, forbear, in closing, congratulating those who had listened to him with so much indulgence, that Worcester County was, at last, in possession of a school which was to remedy and supply so many of the defects and disadvantages under which her industry had hitherto labored, and that its privileges are offered freely to every young man who will reach forth a hand to receive them.

Hon. George F. Hoar, M. C., member of the board of trustees, was introduced, and spoke of the assurance the public has in the usefulness of the Institute, in the fact that it is the result of their own contributions. The Institute is the result of individual benefactions, contrary to the system of the old world, where government and ecclesiastical bodies assume the establishment and control of educational institutions. He paid a high compliment to the general generosity of the public, and especially mentioned the gift of Mr. James White of $1700, besides valuable counsel, and the services or Mr. Abram Firth in inaugurating the enterprise. He also commended the remarks of the previous speakers in regard to the relations of classical and scientific education, claiming equal rank and value for both, and commending the pursuit of either in accordance with the ultimate purpose or pursuit in life. The general intelligence of the mechanics of Worcester of the present day, was commended, as promising the success of the Institute, and he appealed to the public for liberal contribution of funds to add to the endowment, that the Institute may fill its full place among the educational institutions

of the land. The necessity of such education as this Institute can give, was especially urged, from the fact that the general elevation of the public intellect is the only means of counteracting the stream of ignorance which is continually pouring upon our shores from the Old World, and rapidly mingling with the native element, as its equal in political power. It is from considerations such as these that we are induced to work for the establishment and perpetuation of educational institutions like that which we inaugurate to-day.

The President then invited Hon. Henry Chapin, Judge of Probate and Insolvency, who replied as follows:

Mr. President:—If it is in order and no other one wishes to speak, I propose to move an adjournment, and to ask the previous question upon my motion. I listened to the exercises of the morning and took solid comfort in doing so. I learned thoroughly what is meant by a School of Industrial Science. I was not quite clear yesterday, when some one asked me its meaning, but after the able and lucid expositions of Professors Lyman and Woodman, and the enthusiastic, soul-stirring address of Mr. Thompson, your Principal, every one present must be perfectly at home upon the subject. I said that I took solid comfort this morning. I should have done the same thing this afternoon had not the President significantly touched me upon the shoulder before we came back from the collation, and I have known him so well in my experience of the last few years, that I feared the significance of the gesture which he practiced upon me.

I do not propose to speak upon the subject of the school, except to express my admiration of the generous manner in which it has been founded. The President has asked me to speak officially upon this subject, and as Judge of the Probate Court for the County of Worcester, I wish to say distinctly and unequivocally, that I approve of men of means diposing of their property for benevolent purposes *during their lives.* It does not particularly raise my respect to see a man holding on to every dollar to the last, and when he is obliged to part with it, seeming to attempt to make the best bargain he can for himself by some professedly benevolent

disposition of it. But when a live man invests his means in some charitable object, or some public institution, he seems to infuse into it something of that vital energy and activity by which it seems to become a live institution, gifted with the possession of a living soul. When I look at some of these Institutions which are the result of provisions which have been wrenched, as it were, from the possessor by the grasp of death, I am reminded of the remark of an old friend of mine, who applied to a stingy individual the theory that every new-born child became the possessor of the soul of some one who departed this life at the moment of the birth of the child. Said he, "When that man was born nobody died." So it is with certain classes of institutions. They seem to me to have no souls in them, because nobody died. The glory of this school of Industrial Science, which we dedicate to-day, is that it was founded by the voluntary contributions of living men, and as I look upon this splendid edifice, so faithfully and appropriately constructed, it seems to me to be radiant with the souls of those whose means have contributed to its establishment and erection.

Would that Deacon Washburn could have left his sick room and joined in the exercises and festivities of this occasion.

Would that John Boynton could have lived to see this day and rejoice in the result of his friendly gift, donated in his life-time. His act would have been more surprising to me than it was, had he not a number of years ago inquired of me if I knew of any institution which he could endow with a few thousand dollars? Knowing him to be a man of rather an *economical* turn of mind, I had very little expectation that he would ever part with any of his money for literary or scientific purposes during his life. Yet, when his friend, David Whitcomb, spoke of the unknown donor of the sum of one hundred thousand dollars, I was not unprepared to suspect that Mr. Boynton was the man. Still, much as I was surprised at the act of John Boynton, the action of your

president, Ichabod Washburn, and James White created in me no surprise whatever. In common phrase, I have had occasion to measure these men; and when your president touches me so significantly upon the shoulder, and gives me such unlimited authority to speak, I shall take the liberty to say in reference to him and Dea. Washburn, that when I see a man put his name for the sum of one thousand dollars to a subscription paper, and have the coolness when you call upon him, to draw his check in your favor for two thousand dollars; and when I see a man who has purchased an estate for charitable purposes, for the sum of twenty-five thousand dollars, and upon the receipt of the papers, which he had a perfectly legal and honorable right to receive for the original contract price, voluntarily give his check for one thousand dollars more than his legal or moral obligation demanded, I am authorized to say, and I will say, that such acts elevate my idea of human nature, and make me feel that it is an honor to belong to a community where such men are known and honored.

Allow me to add one word more. This prosperous and enterprising city abounds in mechanics and manufacturers of abundant means and rich in resources. The same remark may not apply so appropriately to those of us who are limited to the incomes of professional life. I see before me a goodly number of rich and prosperous men, and, as Judge of the Probate Court of the County of Worcester, fully authorized by your President, my advice to you is, to settle a liberal portion of your estates during your own lives, and do not leave them for your heirs to quarrel about. Therefore, when you look upon this splendid edifice, standing upon this beautiful hill, overlooking this fair city like a beacon light of science and civilization; when you hear the names of its noble benefactors, already spoken in tones of gratitude and affection, destined to grow more and more honored with the progress of the generations; when you shall begin to realize in your own souls the truth of the

immortal declaration, that "it is more blessed to give than to receive," — then indulge, for once, the luxury of emptying your coffers and "go and do likewise."

Judge Chapin alluded to the agreeable and bountiful collation, which had been so highly enjoyed, and moved that the thanks of the company be tendered to the ladies and gentlemen of Worcester, for their elegant hospitality. This was unanimously voted, and the assembly was dissolved.

MEMORIAL NOTICE OF HON. ICHABOD WASHBURN.

At a meeting of the Trustees of the Worcester County Free Institute of Industrial Science, held January 2, 1869, to take notice of the death of HON. ICHABOD WASHBURN, a Trustee of the Institute, Mr. Salisbury, the President, thus addressed the Trustees:

Gentlemen: — It is the dictate of duty and of proper sentiment that we should devote an early hour of this day to an interchange of thoughts on the death of our respected associate, Hon. Ichabod Washburn, who, after a long course of distressing disease, with painful and increasing physical disability, died at his home in this city, on the 30th ultimo, at the age of seventy years, four months and nineteen days. The important institution which is intrusted to our care, and from which so much of good is demanded and hoped for, had no more devoted friend, no more wise counsellor and no more efficient promoter than he. When the founder of the Institute, John Boynton, Esq., had provided for the intellectual training of our youth in those studies which would fit them for the productive arts, on which civilization and human progress will depend, Mr. Washburn came forward to give application and visible utility to the important department of mechanical science by erecting a handsome and commodious machine shop on the grounds of the corporation, and furnishing it with a steam engine and machinery, and by providing a fund for the compensation of the superintendent of the machine shop and of the hired workmen, and for some aid in the support of some of the pupils as apprentices; and all this was done by an expenditure greatly exceeding his first offer to this board.

It was a noble generosity in our friend to provide for the youth of this and future time a more certain and easier way to win a share of the great success which he obtained by persevering, patient and difficult efforts. He was happy to remember, and no right-minded man could hear him tell without increasing admiration, that when he was an apprentice boy to a blacksmith in Leicester he paid for his seat in the church by making irons for a kitchen fire. He was afterwards a student in Leicester Academy, and for many years he has been a very useful trustee of that ancient and respected academy. In 1834 he established the manufacture of card wire in Worcester, and soon, by the su-

periority of his product, supplanted the supply of the imported article. His machinery and processes were originated and improved by his own studies and experiments, and other varieties of wire-drawing were added and the works were enlarged by additional buildings of greater productive capacity, from time to time, until the Washburn & Moen Manufacturing Company now carry on an establishment which takes a high rank for skill and amount of production among the best manufactories of our country.

Mr. Washburn was a man of great industry in the labor of his mind—the wasting toil, which sometimes consumes the life, while it shows no cause without why the man dies. But he had great constitutional strength, which was apparent in what he could accomplish in his active days, and in long resistance to the severe disease by which his life was terminated. He will be remembered as a public benefactor for his honored example of industry and thrift, for the large employment he provided for the labor of others, and for the wealth he added, directly and indirectly, to the aggregate of the community. He is and will be honored for the liberal use of his wealth, for the aid he gave to institutions of learning far and near, and for his constant contributions for the support of churches and institutions for the promotion of the religious views which his judgment approved and his heart warmly cherished, and for other important public enterprises; and his departure will be lamented with more tender emotions by the numerous children of want and sorrow who were rarely disappointed in reasonable expectations of pecuniary aid from his private and cheerful bounty.

Let us not forget that his great endowment in this Institute was attended by a circumstance which does high honor to his generosity. He had intended to perpetuate his personal connection with the mechanic arts, by being the sole originator of such a school, and consulted with friends on the subject, and he was surprised when Mr. Boynton had occupied the ground. But he expressed no disappointment, and promptly made a donation for the building for instruction. Soon after, with the practical wisdom that distinguished him, he created the department which is the peculiar attraction and strength of this institute. This great benefaction was not a solitary expression of his good will to the pursuits to which he devoted his life. The aggregate of his gifts to the Worcester County Mechanics Association was nearly $30,000, chiefly appropriated towards the building of the beautiful hall, which is designed, primarily, to promote the education and gratify the refined taste of those engaged in the mechanic arts, and he made other liberal gifts for kindred objects. Let us consider, also, for our own admonition, his anxious interest and his faithful attention to his duties as a member of our board. Let us recall his personal presence, in his gentle and friendly courtesy, which was happily combined with his decided opinions and his strong will; and his modest carriage, which did not conceal that personal independence which he had honorably acquired. As a man and a Christian he gratefully enjoyed the success he was permitted to achieve. Though he had no ambition for

political distinction, he served as a member of the school committee, and was a representative and a senator in the State Legislature.

I will not abuse the privilege of introducing the thoughts of the hour. This honorable chair gives me no right to supersede your deliberations by my own discourse, and if it were permitted, I could not pronounce his eulogy. Without any connection of partnership, for half of our lives Mr. Washburn and I were connected by the closest business relations and an extraordinary degree of mutual confidence, and in all that period our friendship was not interrupted nor jarred by the slightest offence or misunderstanding. He gratified me by alluding to this, in taking leave of me at his bedside about a year ago, when he and his friends thought the hour of his death had come—and I will again say farewell to my friend with the solemn cheerfulness which the poet Bryant so well expresses:

> "Why weep ye then for him, who having won
> The bounds of man's appointed years, at last,
> Life's blessings all enjoyed, life's labors done,
> Serenely to his final rest has passed;
> While the soft memory of his virtues yet
> Lingers like twilight hues, when the bright sun has set."

Yes, I am persuaded that, in the mercy of God, he has gone to the rest that is congenial to his energetic spirit, the rest of other and better occupation, not of inactive repose. As the deeds of men are written on the sands of earth and the inscription is soon obliterated by the current of events, I offer the following resolutions to prolong, as they may, on our records and in our hearts, the wholesome influence of a useful and honored life:

Resolved, That as an act of duty we will inscribe on our record, that on the 30th day of December, 1868, our respected associate, Hon. Ichabod Washburn, died at his home, in the city of Worcester, after a long course of painful and exhausting disease, with intervals of relief, at the age of 70 years, 4 months and 19 days. By this event this institute has lost its second founder, who placed on the basis of intellectual education provided by Mr. Boynton, a superstructure for the practical application of mechanical science, in training the accurate eye and the skillful hand.

Resolved, That we will hold in honorable remembrance the services which Mr. Washburn rendered to the city of his residence, and to our country, in improving the machinery and processes of mechanic art, in providing larger occupation and more honorable position and compensation for manual labor, and in the increase which he has made in the aggregate wealth of the community and in the independence and happiness of many homes.

Resolved, That we will cherish the memory of our respected associate, for his faithful and consistent life, for his industry and thrift, and for the liberal use of the wealth which he acquired, in his munificent aid of Christian influences and enterprises, in the promotion of education at home and abroad, in his open hand to those who were struggling for advancement in life, and to those who were oppressed by sickness and poverty, and in the furtherance of all movements for the improvement of men.

Resolved, That while we lament this loss as a calamity to this institute, and a sad privation to ourselves, we will contemplate, for our own imitation, the zealous service and the prudent counsels of our associate in the trust that is committed to us, and the courtesy and independence with which he aided us in our duties.

Resolved, That we will express our respect and friendship by attending the funeral of Mr. Washburn after the adjournment of this meeting.

Resolved, That a copy of these resolutions shall be presented to Mrs. Washburn and the family of our associate, with the assurance of our sympathy in the loss of such a friend, for which the recollections of friendship and Christian hopes are the best alleviation.

HON. EMORY WASHBURN'S ADDRESS.

Mr. Washburn desired to second the resolutions offered by the President, though the full and appreciative notice of the life and character of their deceased associate and friend rendered any remarks, on his part, unnecessary. And yet, as it had been his privilege to have known Mr. Washburn intimately and familiarly from his youth, something, perhaps, was due in addition to what had been so well said, to the memory of one, who had, through a long and honorable life, fulfilled the early promises which had won the confidence and esteem of all who had known him as a diligent, hard-working apprentice. He has illustrated in his life the maxim that the child is the parent of the man. The same law of culture and refinement, the same desire for improvement and to excel in whatever he undertook, which distinguished his after life, were early exhibited in the traits of his youth. Mr. W. had first known him at his entering upon his apprenticeship, in Leicester, in the shop of a mechanic. He had come there a stranger, with no connexions or associations to prompt or encourage him to any higher efforts than to learn the details of a laborious trade. Nor did he find in his employer any thing to inspire any higher aims or purposes. But from the first, he manifested an innate taste and desire for a higher education and a culture above that to be found in the training of the shop. And with these was also developed that calm, undemonstrative firmness of purpose which enabled him to surmount the difficulties and embarrassments which, in most young men, would have deterred them from making the effort. We accordingly find him obtaining the means of attending the academy in that town, by earnings gained by him in little sums by overwork in the shop, and by making use of the hours usually devoted by apprentices to rest or amusement. It was the same trait of character which he afterwards exemplified in his patient and persevering struggles to perfect a new branch of business in which he engaged, and which was crowned with such signal success. It marked his course through life, and sustained him in his early efforts in this city, to which he had come after completing his term of apprenticeship, without capital or patronage, or any resources beyond his own hands, a hopeful spirit and a firm resolve to merit success.

Though he made no pretensions to superiority among those with

whom his lot was cast, he had many of the unmistakable traits of character which mark a great man. His reach of foresight, the accuracy of his judgment, the quiet self-reliance which led him right on to the accomplishment of whatever he undertook, were stimulated and sustained by the high motives and generous aims which guided him in all his enterprises, and never suffered him to be disheartened by difficulties that stood in his way. Show him what was right, and nothing could swerve him from the course of duty. In such a case, he knew no line of policy but that of rectitude. Although he began with little or no means, and had to struggle with many difficulties and disappointments before he could command resources in his business, a delicacy of sentiment, which did honor to his nice sensibility, would not allow him to make use of funds which were lawfully his own, but upon which others might, in certain contingencies, have an equitable claim. And instead, as is so often the case, of feeling a desire to hoard and accumulate wealth, in the success of prosperous enterprise, because of his having once felt the want of it, his heart seemed to expand, and his hand to open to the calls of charity and benevolence in proportion to his growing means of indulging the prevailing spirit of his nature.

There was also something in the character of his benefactions and the objects of his bounty, which indicated the respect which he always felt for whatever tended to elevate and improve society and individuals. Education was an object of special interest on his part. He contributed to theological seminaries, he helped to found or aid existing colleges and institutions of learning. You have paid but a fitting tribute to his munificence in helping to found and build up the institute of which you have, in part, the charge. It will, we trust, be a monument of his foresight and liberality as long as science and the arts shall continue to shed their blessings on the human race. Nor will it be found that his beneficence ceased with the termination of his useful and active life. Many who, like him, are to make their way into life by diligence, good conduct and the aids of education, will have occasion to remember with deep gratitude and respect the renewal of that princely bounty which he bestowed upon this institution in his lifetime. Nor this alone—other institutions of charity and benevolence, founded by his munificence, will leave a record which posterity will read, of how much better the world has been made for his having lived.

He would not forbear to refer to one principle which their friend had so beautifully illustrated in his whole life, and that was the religion which he professed. It was seen in his daily walk, in his intercourse with men, in the sustaining power by which he passed through the furnace of affliction, in the sweetness and winning manner which drew to him the confidence of children, and the love and veneration of those to whose physical wants and spiritual comforts he so faithfully ministered, in his devotion to duty, and the entire consecration of himself and all he possessed to the honor and service of the Master whom he so diligently and faithfully served.

Nor would the picture of his life be complete if this pervading trait in

his character were to be omitted. It gave to his worldly success a new claim to admiration, to mark the modest humility with which he bore prosperity, and the devout gratitude which he paid to that Providence which had made him an instrument of so much good to others.

REMARKS BY REV. DR. HILL.

Rev. Dr. Hill followed in a few brief remarks. Judge Washburn, he said, has described the deceased in his boyhood, as he had known him, a pupil of Leicester Academy, and a poor young man just entering on the career of life in our city. I have seen him at probably a later period than any one here present. I called at his house on Saturday, just before nightfall—a few hours only before the last access of the disease which separated him from conscious intercourse with the living, and terminated in his death. I had not seen him, except for a single moment on the same day, since his first attack, twelve months ago. I thought him changed. His cheeks were sallow and sunken; there was an unnatural gleam in his eyes; an unwonted tremor and tenderness in his voice. He had had a peculiarly happy day. He had been driven out to the neighboring town of Millbury, and visited the scientific school, and spoke with especial animation of the pleasure which he had enjoyed, and melted as he spoke.

I am most grateful for that interview and recall it with satisfaction because, in the few moments of its occurrence, the distinctive traits of Mr. Washburn's character were illustrated more broadly than they might have been in many hours. His peculiarities were strong in death. No one who knew him could have failed to notice in him a prompt, genial disposition to acknowledge the surprising changes which had come over him in the course of his mortal experience. He had been greatly prospered, a rare success had attended him in his business, and his means of usefulness had grown to an almost fabulous extent. But, like the English bishop, who had the shoemaker's bench on which he used to work borne to his palace and kept there as a precious memorial of his early struggles, Mr. Washburn was fond of reminding himself and telling others from what humble beginnings he had risen—how he had come to this city, then an inconsiderable country town, carrying all his effects in a little bundle under his arm; and how, when he was a pupil at Leicester, he went to the anvil and forged hooks and bolts in order to pay his pew rent; and how he laid his first offering on the altar of charity—more memorable for the disinterestedness of the motive than the largeness of the gift. So on this last night of our interview. He spoke to me of his interest in the shop connected with the scientific school—how he longed to have it brought to a completion and

consecrated to its work. "O, let me but live to see that! How would I like to beat out the first piece of iron in that building!"

Another characteristic remark followed. He had long borne on his heart the condition of his fellow mechanics. Prospered, he embraced in his sympathies those who were still in the heat and dust of mechanic labor. He sought to afford facilities for lightening mechanic labor and improvement in mechanic skill. He projected, many years ago, building a shop in which apprentices might be taught the practice while they learned the rules of the trade. It had been a long-cherished scheme for whose success he had expended thought and made large pecuniary arrangements. And when he learned that Mr. Boynton had given a munificent sum for the founding of a Technical institution, though he was disappointed that his favorite plan for benefiting the mechanic had been anticipated, he cheerfully yielded and became subordinate where he had intended to lead and associate his name with this magnificent enterprise. But though thwarted in this respect, no particle of jealousy rankled in his bosom. He gave to the institution as generously as if he had been leader and not follower in the project. He said to me his heart was profoundly in this work—"I mean to spare no pains nor expense to make the shop as complete in every part as it is possible to do."

Then, again, his giving, at first prompted a by delicate conscience, at length ripened into a passion. Inconsiderable, at first, like hers who threw only two mites into the treasury, with the increase of his property it grew until it became boundless. He listened patiently to every claim upon his bounty. Steward of the heavenly Benefactor, he limited his gifts to no class of objects, but freely dispensed them to whatever might promote the interests of knowledge, religion and humanity. Though an uneducated man, he could appreciate the value of liberal studies, and was the benefactor of more than one of the feeble colleges of the land. Though in possession of a princely income, he had nothing to spend on personal luxuries — everything to encourage and help those who needed. He founded and sustained a chapel for the benefit of the poor in the city, and was equally ready to feed a starving family at home, to clothe a naked company of freedmen in Georgia, or to hang a bell on a vacant church-tower in Maine.

But the hour approaches when we must bring these pleasant reminiscences to a close and follow in the funeral procession which accompanies our revered friend to the place of his repose. He heeded well the suggestions of a believing and adoring heart, and served his day and generation. He has finished his course. He has left rare memorials behind, more enduring than brass or marble. He has gone to his reward. And "blessed are the dead who die in the Lord, for they rest from their labors and their works do follow them."

Hon. George F. Hoar said he cordially agreed with the sentiments which had been expressed, and spoke of the character and eminence of Mr. Washburn as a peculiar product of the institutions of our country, but has furnished no report of his remarks.

The resolutions were then unanimously adopted, and the trustees adjourned to attend the funeral.

WORCESTER COUNTY

Free Institute of Industrial Science.

ADDRESSES

OF

INAUGURATION AND DEDICATION,

WORCESTER, NOVEMBER 11, 1868.

MEMORIAL NOTICE OF JOHN BOYNTON, Esq.,

Founder of the Institute.

MEMORIAL NOTICE OF HON. ICHABOD WASHBURN,

Founder of the Practical Mechanical Department

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