

THE  
PURPOSE OF TEXTILE EDUCATION  
AN ADDRESS

AT THE OPENING OF THE LOWELL TEXTILE SCHOOL  
YEAR, COMMENCING OCTOBER 4, 1897

BY

C. J. H. WOODBURY

*Secretary to the New England Cotton Manufacturers' Association*



WALTHAM, MASS.  
PRESS OF EPHRAIM L. BARRY

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The broadest and most equitable judgments upon the American people, with their surprising new world answers to the old world problems, have not been made by any of ourselves, but by foreigners. The keen observations and accurate conclusions of DE TOCQUEVILLE, BRICE and PIDGEON upon the American people are records of deep insight, which form an essential part in any study of the characteristics of this nation, but still earlier testimony more pertinent to this occasion was given by LAFAYETTE, while a guest of the country in 1824. He was deeply impressed with the development of the nation, and on many occasions stated his belief that its progress was due to that strength of purpose which was so generally an individual characteristic as to form in the aggregate a national trait. "Instead of keeping means of livelihood in the background," he said, "it is entirely proper (the polite Frenchman!) on meeting a man, to ask him what he does for a living. When a man is referred to, one may ask his vocation, and if one inquires of a young boy what is to be his occupation, it has been decided and he will tell you."

But this unity of purpose of life existed long before the pilgrimage of LAFAYETTE; it anticipated the settlement of this country and reaches back to those who decided to cross the Atlantic, knowing but little of this wilderness, but knowing full well that here a living could be obtained only under the most severe conditions.

They were not beguiled like the Spanish adventurers with anticipations of El Dorado, and the fountain of youth, but expected a wilderness abounding in savages, devils, wild asses and unicorns.

The conditions of life were so severe that many of the Massachusetts Bay colonists returned, but the more vigorous remnant conquered the hostilities of nature.

From these progenitors the New England people have been bred to a line of industry, skill and frugality; and whatever may be true of the proverbial Yankee ingenuity, its fertility of mental resource, endowing its people with wisdom to plan and vigor to execute, is merely a logical sequence of human development through succeeding generations under a fixed purpose.

They knew that there was no premium upon ignorance, and on September 8, 1636, the General Court, "Voted: £500 to found a college," and two years later this grant was augmented by the bequest of Rev. JOHN HARVARD, who gave to it his library, half of his property, and which took upon itself his name. The amount granted was equal to the whole colony tax for the year, and EDWARD EVERETT stated that this is the first instance in history where the people voted public funds for education.

#### INSTRUCTION IN SPINNING BY THE MASSACHUSETTS COLONY.

But these forefathers meaning to build wisely in attending to the needs of the people, ordered the magistrates and deputies of the several towns, in May, 1640, to make known the "absolute necessity" which existed for the manufacture of linen. They were to ascertain the amount of seed in each of their towns, the names of the persons skilled in breaking, spinning and weaving hemp and flax, and to recommend what steps should be taken to instruct the young in spinning yarn and weaving cotton wool. It appears that this was probably the earliest of the industrial statistics which now serve such an important part in the world's knowledge of itself.

At the October session of the same year, a bounty of three

pence on every shilling's worth of linen, cotton or woolen cloth was voted, but this act was repealed in June, 1641, when the deputies were ordered to direct the people to gather wild hemp and to direct that all possible measures should be taken in families to spin as much as possible. They foresaw that a more systematic course was necessary, and June 14, 1642, passed the act for public education in "training up children in learning and labor," which provided for textile education, and was undoubtedly the first law for technical instruction, giving a manual training outside of the lines of book learning hitherto classed as the whole of instruction.

Let us cite portions of the law applying to textile instruction.

"This Court do hereupon order and decree, that in every towne, the chosen men appointed for managing the prudenciall affaires of the same, shall hencefourth stand charged with the care of the redresse of this evill (*i. e.*, neglect in training up children in learning and labor).

"They are to take care that such (children) as are set to keep cattle, bee set to some other impliment (employment) withall, as spinning upon the rock (the rock was a hand distaff), knitting, weveing, tape, &c. They are also to provide that a sufficient quantity of materials, as hempe, flaxe, &c., may bee raised in their severall townes and tooles and impliments provided for working out the same: and for their assistance in this so needful and beneficiall impliment, if they meet with any difficulty or opposition which they cannot well master by their owne power, they may have recourse to some of the magistrates, who shall take such course for their help and incuragement as the occasion shall require, according to iustice."

These pioneers were more given to making history than to writing it, and it is but natural that we should fail to find any records indicating why this act failed to serve its purpose, but that such was the case is evident from the following act on "spinning", passed in 1655, setting forth in detail the means for instruction in spinning:

"This Court, taking into serious Consideration the present

streights and necessities of the Country, in respect of Cloathing, which is not like to be so plentifully supplied from forreign parts as in times past, and not knowing any better way or means conduceable to our subsistance, than the improving of as many hands as may be in Spinning Wool, Cotton, Flax, &c., doth therefore order, and be it Ordered by the Authority of this Court: that all hands not necessarily employed on other occasions as Women, Girls and Boyes, shall and hereby are enjoyned to Spin according to their skill and ability: and that Select Men in every Towne do consider the condition and capacity of every family, and accordingly do assess them at one or more Spinners.

“ And because several Families are necessarily employed the greatest part of their time in other business, yet if opportunities were attended, some time might be spared, at least by some of them for this work :

“ The said Select Men shall therefore Assess such Families at half and quarter Spinners, according to their capacities.

“ And everyone thus aforesaid, for a whole Spinner, shall for time to come, Spin every Year for thirty Weeks, three pound a Week of Linnen, Cotton or Woollen, and so proportionably for half and quarter Spinners, under the penalty of twelve pence a pound short.

“ And the Select Men shall take special care for the Execution of the Order which may easily be affected by dividing their several Townes into ten, six or five, &c., to appoint one of the ten, six, or five, &c., to take an account of their Divisions and to certifie the Select Men, if any be defective in what they are Assessed who shall improve the penalties imposed on such as are negligent for the encouragement of those that are diligent in this work.”

These acts of the General Court indicate that the government was keenly sensible of the importance of maintaining a knowledge of the textile art. The action of town meetings and the records of selectmen's meetings indicate that this legislation was enforced.



The people showed not merely an appreciation of the importance of instruction in the spinning, but devoted themselves with enthusiasm to the subject.

#### THE TOWN OF BOSTON ESTABLISHES SPINNING SCHOOLS.

The action of the town of Boston deserves a reference as showing the amounts which the people were willing to appropriate for spinning schools.

At a meeting of the selectmen, Sept. 20, 1720, it was voted to insert in the warrant for town meeting, to be held eight days later, an article: "To consider a motion for setting up a Spinning School," and at the town meeting, the subject was referred to a committee, who submitted an elaborate report at the town meeting, Dec. 27, 1720, which recommended the establishment of a textile school with twenty spinning wheels, and included a scheme of premiums. The committee presented alternative plans of constructing a building especially for the purpose, or of hiring rooms in an available building.

This report was postponed until a later town meeting, March 14, 1721, when it was voted: "That the Selectmen conjointly with the committee have authority to let without interest not exceeding £300 for not exceeding seven years to such person or persons, who shall give Real Security for it and to Employ it for Caring on Spinning in this town."

In March, 1754, a town meeting voted: "To appropriate £50, old tenor, to improve the old town hall for a spinning school." This old town hall was built in 1656, and on the site of the Old State House, at the head of State Street.

At a town meeting held April 4, 1769, a committee reported in favor of a number of spinning schools, and it was voted that the town treasurer be authorized to borrow £500, lawful money, for the purpose; £200 of this amount was given to WILLIAM MULLINEAUX, to buy spinning wheels and cards, and £300 was to be lent to him to buy wool, as there were persons ready to purchase for their looms all the yarn which should be spun.

These citations could be continued at length for the purpose

of showing that the earlier legislation and its enforcement furnish numerous precedents for the action of the commonwealth in providing instruction in accordance with the needs of the times.

In the progress of events to the present day, let us still keep in remembrance those wise builders whose energies were not devoted to the erection of mills, but who laid the foundation for the industry by their appreciation of the importance of training up the young people to a knowledge of the textile art.

#### THIS USEFUL INSTITUTION.

This school is an institution with an aggressively useful purpose, endowed by the Commonwealth and enriched by gifts from those who appreciate the worth to be derived from its teachings. It complies with the requirements of the Greek philosopher who when asked: "What things are best to be taught to youth?" replied: "Teach youth those things which they will need when they become men." It is here, indeed, that the methods of textile manufacture are presented before you, but with the changed purpose that instead of being operated toward the final result of the cost of the product, the object of the work is to show how.

A mastery of the course would give one a rare knowledge of many things throughout the whole range of the textile art, and it is probable that many a successful textile manufacturer, if confronted with questions which could be readily answered by its graduates, would be in a position pictured by Dr. OLIVER WENDELL HOLMES when he doubted if one of the Harvard faculty could pass the entrance examination to the university.

There is a progress in the conditions of manufacturing. There is an assimilation of facts, until one is permeated by their spirit, which requires time, and forms the judgment of maturer years, and there is a knowledge of human nature, both an experience and an inspiration, which is essential to success in relations with mankind.

Practical experience is essential in any occupation, but such knowledge is limited by the surroundings under which it is ob-



tained. Here, instead of the associations of a single mill, are concentrated the means and information from a broad range, and this, when later applied in practical life, will enable the student to more thoroughly master the conditions of any one establishment, and to become more useful in his vocation.

President GARFIELD said that a seat on a bench with MARK HOPKINS in a log cabin would furnish the conditions of a liberal education. Be it so, but the duplicates of MARK HOPKINS are not so numerous as the pupils, and teaching is necessarily communistic.

#### PURPOSE OF TECHNICAL INSTRUCTION.

The purpose of any technical instruction is not to obviate the necessity of practical experience, but to broaden and render the graduate more useful — meanwhile water still remains a very useful element in which to learn to swim.

Technical instruction does not increase "handicraftness", nor does it enlarge the mental scope of the pupil, but it organizes the powers within one for maintained concentration of effort, and adds to the potentiality by furnishing the methods of learning many things from the experience of others, and enlarges the capabilities by avoiding the useless labor of an untrained mind.

Among the elements of personal experience, which each one must master for himself, there is nothing so entirely dependent upon the practice and observation of the individual, as the use of the hands. Dexterity is of the hands—handy. What amount of reading and study could inspire one to tie a weaver's knot?

A question which has often been discussed among the friends of technical instruction asks, which should come first, the teaching in the school, or the practical experience in the mill or shop? The best opinions on the subject appear to agree that there should be an alternation, and that technical instruction should be prefaced by a sufficient amount of practical experience to give a purpose to the work of the student, and to impress upon him the necessity of a further knowledge of the subject to which he proposes to devote himself for an occupation.

It is justice to the student and not disparagement to the institution that its functions should be correctly understood. Instructors can teach, but the student must learn for himself. This plant, covering the main points and principles of textile manufacturing, may well bear as a motto, "Tools to him who can use them." It should instill in its pupils such a grasp of principles and such details of application that its graduates may be enabled to follow careers of increasing usefulness, and, according to their capabilities, become captains of industry. The worth of all knowledge, especially when that knowledge is an element of value in a person's occupation, lies in its availability for ready use when desired.

#### THE IMPORTANCE OF ORGANIZING ONE'S SELF.

A physician once told me that every conscious impression on the brain was permanent, and that memory was merely the power of recalling a mental impression. There is such a multitude of demands upon one's memory that it is essential to organize personal experiences and observations, and in this connection the advice given me by Mr. JAMES B. FRANCIS is well worth your consideration. He advocated reinforcing the memory by systematic note-books, which should contain a record of items applying to one's occupation. The method of arrangement would be entirely one of individual judgment, the only suggestion being that it should be an accurate and available record of personal experience and observation.

For use in connection with keeping a record of work and study, especially sketches and drawings, it appears that the books containing the day and date at the top of each page, which were originally made for log books, serve a more convenient purpose for the first entry of each day's work and other memoranda than most of the books made for diaries or journals.

One of the most important requirements relative to the course of study and methods of instruction in this institution is contained in the annual catalogue [page 28] where note books are prescribed, a time set apart for entering up notes, and the state-

ment made that the care and accuracy with which these books have been kept will be considered in the final examination. The system followed by every business house of keeping a press copy of every letter written, should be applied to the personal affairs of individuals, the small roll copying books enabling this to be done without the use of the cumbersome copying press, feasible only in an office.

#### RESULTS OF INCREASED PRODUCTION.

The increased rapidity of production is furnishing the necessities of life with less work, and therefore it requires a smaller amount of labor for the individual to provide for his requisites than under the former conditions; but there is in each of us an inherent propensity to provide for one's self at about the same ratio of expenditure and income. The stimulus of increased purchasing power of one's labor inevitably causes larger purchases.

The truth of the statement that the luxuries of one generation form the necessities of the next, is illustrated in the biography of Dr. LYMAN BEECHER, where it is related that, during their residence in the Western Reserve, some eastern relative gave them a lot of carpet yarn, which Mrs. BEECHER wove into a carpet. After the carpet had been laid, one of the deacons called at the parsonage and stopped abruptly at the door of the room. "Come in," said Mrs. BEECHER. "I can't come in 'thout steppin' on 't," was the reply, as he entered on tiptoe and, laying his hand on Dr. BEECHER'S shoulder, said in deep concern, "Brother BEECHER, do you expect to have this worldly vanity, and the ineffable joys of heaven beside?"

Satisfaction with anything which can be improved is an indication of degeneracy. Ignorance is contented, and it is the divine discontent which has worked out the betterment of humanity. The British growl has been the making of that nation.

## INCENTIVES ESSENTIAL TO EFFORT.

There cannot be any improvement unless there is an incentive in the promise of unusual results from a great effort. The exclamation of NAPOLEON that every soldier carried a marshal's baton in his knapsack, made armies victorious where mercenaries would have fled.

HORACE GREELEY said that when in an agricultural district in England, he saw a farm laborer chopping away at the grass with a bushwack scythe having a straight snath, and calling the man to the hedge, said, "My man, if you had a scythe a yard long and an inch and a half broad with a curved snath giving a good balance, such as we have in America, you could do twice as much work."

"May it please your worship," replied HODGE, "I do not have twice as much work to do."

In relating the incident, Mr. GREELEY added that there was more political economy in that sentence than in any other within his experience. When there is a possibility of advancement a man is stimulated by the fact that he does "have twice as much work to do."

## THE OPPORTUNITIES OF THE TEXTILE SCHOOL.

This school has an opportunity to improve the standard of taste in design. People like to hear old songs, to be told what they know, and to gaze again on scenes consecrated by pleasant memories. Standards of beauty and taste are all built upon familiarity with that which we are accustomed to as a part of our race and civilization. These conventionalities impose such limitations of scope in design that a good designer must also be a good copyist, and show his skill by improvements on the original.

The fire-worshippers of the Orient twist a palm leaf to light the sacred fires of their religion, and this basis of a palm leaf in its conventionalized form is the groundwork in many Persian designs. In this connection I would recommend constant care

to the suggestiveness of your surroundings as furnishing themes for design.

The designing rooms of a celebrated French print works were in the office building in Paris, until the manager feeling that the designers were diverted too much by the attractions of the city, moved them to the works in the country. The product of the establishment immediately began to fall away from the standard. The reason was not far to seek. The designers, failing to receive the stimulus and suggestion from the pictures, colors and scenes of city life, had in like measure been impaired in the fertility of artistic resource. The department was moved back to the city with favorable results in the restoration of good designs.

The Boston Museum of Fine Arts will inaugurate in January, a department consisting of samples of fabrics mounted on frames so that they may be studied by those interested in textile design. It will contain the most complete collection which can be obtained from the looms of both savage and civilized races, the early cloths of Egypt and the best examples of goods bought and sold today. This collection will not be open to the general public, but is to be reserved for the use of students who are welcome.

What place could be more appropriate for the advanced study of textile design than in an institution devoted to the fine arts?

Taste asserts itself in raiment, and people will exercise taste in the selection of their clothing to the limit of their means. If foreign goods have the best designs and most pleasing colors, then foreign goods will be imported to meet the demand which will surely ensue. There can be no prohibitory tariff upon what ministers to excellence in taste, and nothing but an embargo can keep goods of foreign manufacture outside of our boundaries, if they are superior in design to our own.

A protective tariff will defend American wages, but it will not serve the interests of American capital, unless its investments are administered with skill in meeting internal competition. If the price of an article be increased through the provisions of a tariff, it can be of little avail, unless the same law also raises the

wages of its customers to a purchasing point. Marking up prices is not the equivalent of making a sale.

A clergyman, while visiting one of the Lowell mills under the escort of the treasurer, expressed wonder at the large supply of coal. He was told that this coal was only a portion of the annual consumption, and that the year's supply had been purchased for \$20,000 less than for the previous year. "You have made a very creditable saving for the corporation," remarked the clergyman. "On the contrary, I should have preferred to have bought the coal for \$20,000 more instead of \$20,000 less; although as treasurer it was my duty to purchase the coal at its lowest market value. That difference in price was largely made up in miners' wages, and if those wages as a part of a general prosperity were higher, then the miners would have bought more cloth, and our mills would have had their share in the better sales which would result from such prosperity."

#### WEAVING AS A FINE ART.

A paper was read before the New England Cotton Manufacturers' Association, upon "Weaving as a Fine Art," and, when a member was asked, in accordance with the custom of that organization, to discuss the paper, he declined, saying that he proposed to confine his attention to "Weaving as a Profitable Enterprise."

Both were right; the function of a mill is to be a profitable enterprise, but if the operation of textile mills during the last few years has not required the exercise of all the fine arts known to those in the business, the condition of affairs has been universally misunderstood. There is competition in price and in quality of goods of every grade and variety which calls for the highest type of mental skill.

There are two desired elements in the production of goods, either of which will predominate according to the type of goods manufactured. In any line of standard goods, competition requires that the cost of production must be reduced to its lowest terms, not always in rates of wages, but in organization both of



mill and help, and in the judicious elimination of machinery which has become superannuated by long service or depreciated by subsequent invention. On the other hand, without detracting from the worth of any possible economy anywhere, in the manufacture of specialties, the elements of design and the color of the fabrics have become live issues.

At an early day the cotton mills were of better construction, with machinery and mechanical organization superior to the woolen mills, because in those plain cotton mills the problem was largely a mechanical question, while in the woolen mills matters of design and color in the fabrics were essential to success and therefore received the greater portion of the attention of the management who, at that time, may not have as fully considered the lesser advantages of cost of manufacture. In course of time each branch of the textile business has learned from the other. The later woolen mills and their equipment have represented the best engineering work, while the cotton mills making figured or dyed goods, have improved both the design and color of their product.

Far higher skill, with more satisfactory results to the owners, may be applied in the successful commercial production of less expensive goods, and it should be remembered that the millions have more money than the millionaires, and that they spend it more freely.

#### THE LINE OF TEXTILE INVENTION.

Most of the textile inventions are entirely in the line of obtaining an increased production, and the result has been beneficial in two directions: a portion of this increase has been applied to the diminution of the cost of the goods, and the remainder to the reduction of the hours of labor. The invested capital still struggles for its existence.

An India shawl is the result of many years of handiwork; the manufacture of a Paisley shawl requires about the same number of hours as the original shawl, which furnishes the design, required years.

At the Gobelins in Paris, a weaver makes about a square yard

in ten months, and while this product may not be duplicated, it is, nevertheless, the application of modern machinery to a similar fabric which has alone made the general use of carpets possible.

In considering an art of such magnitude as the manufacture of cotton cloth, one naturally turns to the time when the industry originated, as a means of estimating the rate of growth. It is hardly feasible to state the date of the first cotton mill, unless the statement is coupled with a definition as to what constitutes a cotton mill. As early a time as when the product of yarn was in excess of family requirement, and the space required for spinning wheels or looms being greater than the room available in the domicile, additions to the dwelling or a separate building were erected, might be claimed as the date of the first cotton mill. If this special building for any part of the process was operated by water power, then it was a little over a century ago that the first cotton mill was built; but if a cotton mill is an establishment where cotton is made into cloth by machinery driven by power, the Boston Manufacturing Company at Waltham, in 1815, was the first cotton mill in the world.

#### MORE PEOPLE USE HAND THAN MACHINE-MADE CLOTH.

Vast as is the product of textile mills all over the civilized world, and universal as is the use of cloth, yet the application of machine-made cloth has penetrated but little beyond those people who can be directly reached by railroad or deep water transportation, and the swarming population of oriental and barbaric nations still wear for the most part hand-spun goods. I have been in the mountain regions of western North Carolina, on the borders of that plateau larger than New England, whose people wear hand-spun cloth.

In the commercial sense, the industry of cotton manufacturing began within the memory of men still living — a work which had its incception in the fertile brain of FRANCIS C. LOWELL, who produced the complete mill organization in every detail, inventing a power loom and numerous important improvements in machinery, established corporation boarding-houses, societies for the education and entertainment of the help, arranged the

present method of selling the product, and established the precedents or the cotton manufacturing industry. All this took place during the last six years of a life marred by feeble health. Passing away at the early age of forty-two, he leaves as an epitaph, his name to this busy city, which continues his requiem in the hum of spindles and the crash of looms.

#### THE SOCIOLOGY OF COTTON MANUFACTURING.

This new cotton industry has solved some problems of sociology and raised new ones. It has added to the years of life by furnishing more suitable clothing. It has permitted the development of diversified industries by diminishing the amount of time required by the individual to provide clothing, but the problems arising from the concentration of subdivided labor organized into a unit for the single purpose of supplementing with brawn and brains the action of machinery in the output of goods, are still unsolved.

How much of the increment between raw material and product shall be distributed for the life work put into the fabric, and how much shall be left for that surplus of other labor, which has crystallized into the capital which builds, operates and maintains the vast plant?

Whatever may be the individual opinions on the equities of the division of this increment, it is a living fact that the employment furnished by these mills attracts to their service people from other vocations throughout this country, draws them across the frontier on the north, and from beyond the seas on the east.

And it is just as true that the profits to the mills have been merely sufficient to preserve financial stability in the conduct of business and the maintenance of the plant against its wear and tear, and against depreciation by subsequent invention. They are less than those of any other large investment and not comparable with the fortunes made in the mercantile marine of the last generation, which made accumulations at a rate pictured by EDWARD EVERETT as "beyond the dreams of avarice," and which later furnished the nucleus for establishing the mills in this city. Wages have increased, the hours of labor have dimin-

ished; the quality of goods has been improved, and the price reduced.

Goods made at Waltham in 1816, cost 30 cents per yard, and the corresponding goods have sold during the present year for  $4\frac{3}{4}$  cents per yard.

As FRANCIS C. LOWELL solved the problem of the power loom in the attic on Broad Street, Boston, with cotton yarn on one side, and the fabric to be made on the other, so these social problems, which involve the most complex relations between man and man, must be solved by the force of thought, applied to present conditions, in order that labor and capital may best thrive in ministering to the advancement of civilization.

The whole trend of affairs, as applied to the textile art of to-day, is towards enlightened consideration in manufacture, excellence in design, and skill in dyeing, and for that purpose it is taking to itself the best in engineering, art and chemistry.

The three manufacturing nations of Europe, stirred by their own competitions, have established textile schools throughout their manufacturing districts, and let us confidently look upon this institution as embodying the best results for the American textile industry, and richly contributing to the progress of the completing century.



**Francis C. Lowell.**  
DIED 1817.

