instrument at command, and trusting to the younger generation to work out for themselves a more truly rational system. He would encourage the friends of the league to continue to extend their work, if not for others, for their own sake. His experience was, that to give a course of lectures was to go through a course of self-education. To lecture was to undertake a very solemn and trying task. It was to lay one's self bare to view, and to ask one's fellow-citizens to judge whether one's education had been of any good worth speaking of. He trusted that with them it would be found that the attempt to teach others proved their own best education.

MANUAL TRAINING AND PUBLIC EDUCATION.[1]

"THE public school," said John Quincy Adams, "is one of the four pillars of the state." It is firmly intrenched in the heart of every loyal citizen. It is always on the side of good order and of good morals. The man who has ventured to suggest any important change in the public-school system has been suspected of weakness in his head, or dishonesty in his heart. But here is a radical change from the public school of Horace Mann, of Daniel Webster, and of the host of other worthies who have either aided in its establishment, or have been grateful partakers of its benefits. It is only reasonable to ask, Why this change in the system to which a large part of the prosperity of the country is undoubtedly owing? Why add to the geometry and philosophy which have descended to those quiet halls from the academic groves of Athens? Why add to the poems of Virgil and the orations of Demosthenes, the tool of the mechanic and the whir of modern machinery?

As an instrument of culture, — for it was Emerson who said "a man should have a farm, or a *mechanical craft* for his *culture*," — the manual-training department of the public school was unnecessary a hundred years ago. As a means of teaching the mechanical arts, it would even then have been an improvement on the apprentice system, although the apprentice then occupied a very different position in the shop of the master. But the New England boy of the olden time, like many a country boy of the present day, had a manual training outside of his school. The Yankee knack at turning one's hand to almost any thing has become proverbial. The mechanical ingenuity of the New-Englander is to be attributed only in part to his literary training. In the early New England life, and in the New England villages in which the pristine habits are preserved, John Fiske remarks, "The universality of literary culture is as remarkable as the freedom with which all persons engage in manual labor." — "The stony and somewhat sterile lands of New England," says the Englishman Mather in his late report to the British parliament, "require intense activity, industry and skill on the part of the farmer, to make a living. As hired labor is very dear, he depends on his own household for help. Every kind of work has to be done at home. Blacksmith's, wheelwright's, machinist's, carpenter's, and hydraulic work becomes as familiar to the farmer, in a rough and ready way, as ploughing, tilling, sowing, and reaping. All handicrafts, in a greater or less degree, are acquired. The farmer's boy is thus provided with an industrial training of the best kind in and around his home. His wits are sharpened, his perceptions developed. There is a large field for the immediate application of knowledge acquired at school, on the one hand; on the other, the school exercises and lessons are more readily understood by a boy or girl having in daily life to deal directly with natural forces and laws. These district schools, holding only twenty weeks in the year, associated as they are with agricultural and mechanical occupations, produce better results, as a whole, among the artisan classes, than the city schools, the attendance at which is for the entire school-year of forty weeks. My attention has been drawn to this fact by many employers and educationists, and it has been confirmed by my own observations. *It suggests the importance of introducing into the elementary public schools of cities some industrial training.* 'Our brightest boys come from the country,' is a phrase which has become very familiar to me in America."

Such are the observations and conclusions of Mr. Mather. That they are true cannot be denied; and since they are true, the reason and the wisdom of this new departure become apparent.

The influence of physical vigor and manual skill in developing sterling character is nothing new. In the virile days of Rome, when "to be a Roman was greater than to be a king," there was a remarkable resemblance to the early New England life.

"The oldest lays of Rome," says Mommsen, "celebrated not only the mighty war-god Mamers, but also the skilled armorer Mamurius." "The Roman boy, like every farmer's son, learned to manage horses and wagon, and to handle the hunting spear." "In the earliest Rome the arts of forging and wielding the ploughshare and the sword went hand in hand, and there was nothing of that arrogant contempt for handicraft which was afterward met with there."

[1] From the *Industrial world and iron-worker.*

Nor does our own republic fail to furnish us illustrious examples of noble men worthy to be ranked with Cato and Brutus, whom an admiring nation lifted from village or farm to the highest places of honor and power. I need not call the roll from Washington to Lincoln; I need not name Garfield and Grant, and a host of others.

Notwithstanding a popular superstition, there is no necessary antagonism between brain power and muscular power. A man may be a scholar and artisan, as well as a scholar and an artist. Physiology teaches that the brain is best developed by the best development of the body. Dr. Henry Maudslay says, "It is a foolish and fruitless labor to attempt to put asunder mind and body, which nature has joined together in essential unity. The right culture of the body is not less a duty than — is indeed, essential too — the right culture of the mind. The muscles are not alone the machinery by which the mind acts upon the world: their actions are essential elements in our mental operations."

Dr. Edward H. Clarke says, "The development of the soul and mind — of the *ego* — resolves itself into the development of the brain. No perfect brain ever crowns an imperfectly developed body." Dr. Clarke, writing *not* in the interest of manual training, maintains that parts of the brain preside over special muscular movements, and are more or less developed by such movements. And it is a well-known fact that that side of the brain which controls and animates the right hand is, in right-handed persons, larger than the other side; and an eminent living physiologist has lately recommended the training of the left hand of children, in order to increase the brain-power of the race. Of course, it is possible to develop one part of the human organism at the expense of another. We have illustrations of this in the gourmand, frequently in the scholar, too often in the laboring man, driven by stern necessity.

Tyndall remarks, "We need muscle as well as brains, character and resolution as well as expertness of intellect. Lacking the former, though possessing the latter, we have the bright foam of the wave without its rock-shaking momentum."

Before considering some charges brought against public schools, I wish to speak of the opinion which has gained currency in certain quarters, that the advocates of manual training are the enemies of the public-school system. Whatever may be the sentiments of others, this accusation is groundless in regard to myself. To the superiority of the public schools of America I am always ready to bear cheerful testimony. But, in my judgment, the position taken by the friends of manual training in regard to public schools is of far less importance than the position of the friends of the public schools in regard to manual training. In many cities it is clearly perceived that manual training is neither the enemy nor the rival of the public school, but is an essential part of it.

Both European and American schools must plead guilty to the charge of over-pressure. Medical men testify to the injurious effects of long-continued taxing of the brain combined with inactivity of the body. The public has insisted upon long hours and close confinement of children in school, often against the protests of their teachers. The latter, in their laudable ambition for the progress of their pupils, have fallen into the same error. After making allowance for the ill health due to late hours, improper food, and other causes for which parents are responsible (and this amount is greater than parents will admit), the ill effects of school-life on many children must be acknowledged. It is not surprising that the proposition to make an addition to our already overloaded curriculum seemed to many a move in the wrong direction. The assertion that a pupil could accomplish his regular school tasks, *plus* the manual work, with less tax upon his strength than that demanded by his academic work alone, certainly has the appearance of a paradox. But such is the truth. Improved health, more rapid advancement, greater enjoyment of school, is the frequent voluntary testimony of pupils in manual-training schools, and of their parents. On the other hand, no pupil entering the Chicago manual-training school in good health has, as far as my knowledge extends, ever been withdrawn on account of loss of health from school-work. The manual-training school recognizes the fact that alternation of work is rest. It brings into activity a rested portion of the brain, and permits the restoration of the wearied parts. A course in Latin and Greek, combined with violin and billiards, was lately prescribed for a railway president threatened with softening of the brain from overwork. A cure was effected. Assuming, however, what seems *not* to be true, that the book-work of the high-school boy exceeds in amount that of the manual-training school pupil, it is still true that the best knowledge of the world and of the age in which he lives, and the greatest power to subjugate that world to his own will, is in the possession of the graduate of the manual-training school.

There is a mental discipline obtained from the course in wood and iron working. The knowledge of the properties and laws of matter secured in the laboratories of the manual-training school exceeds the knowledge that can be obtained in the ordinary school. Three years' actual work

with wood, iron, steel, brass, zinc, lead, with plane, saw, lathe, hammer, forge, cannot fail to arouse and stimulate a boy's mental faculties. The high-school boy's knowledge of the laws, powers, and capabilities of modern machinery is nothing. To him this is a *terra incognita*. Mental power is needed to understand a steam-engine, as it is needed to analyze a sentence. If the boy has read three books of Caesar instead of four, but in place of the fourth book, 'De bello Gallico,' is able to describe the working of every part of a Corliss engine, he has not lost mental power by substituting the study of the modern giant for the study of Caesar's bridge. Three years in a training-school undoubtedly fit a boy to grapple with the problems of life better than three years in the high school. In Baltimore, Philadelphia, and Toledo it will be shown that three years in a high school with manual training give a boy a better start in life than three years in a high school without manual training.

It is the belief of many that elementary education should include nothing except a purely intellectual training (with, perhaps, some attention to morals and practical hygiene); and that the school, certainly the public school below the university, has no concern with the trade, business, or profession which the child may follow in after life; and that the public school would be guilty of leaving its true sphere should it give the child any bias whatsoever to any calling. The position is also taken, that, whatever may be his future vocation, this training of the intellect is the best possible preparation which the child can have.

No word of ours shall ever be quoted derogatory to the highest intellectual culture for all men and for all women. This age has justly been called the age of iron, of steel, of steam, of electricity. But it is the age of steel, steam, and electricity because it is pre-eminently the age of *brains*. Any education that neglects intellectual culture, or makes it secondary to any physical training, is an education to be condemned and avoided. A republic should have no proletariat. The education advocated by this paper recognizes the culture of the mental and moral faculties as essential to, nay, as the foundation of, the highest development of the individual, whether artisan or artist, ploughboy or president. It would not abandon, but would, if possible, elevate the high American ideal which would lead every child into the pleasant and fruitful fields of literature and science. But it recognizes the fact that in his present state of existence the boy has a body as well as a mind; and it protests against the mediaeval doctrine that the highest culture of the intellect is obtained by the mortification or neglect of the physical nature. On the contrary, it asserts that the connection of mind and body, however that mysterious union is effected, is such that the proper training of each is essential to the highest development of the other.

The first great object of education is preparation for the battle of life. To the great mass of mankind this must always be the primary, if not the sole, object of education. The great majority of children leave school at a very early age, averaging probably thirteen years. Many of these children leave school to assist at once in the support of the family; many others to obtain some education, not found in the public school, which shall fit them to earn an honest living.

Every year there is need of a large addition to the number of skilled mechanics. Where is the boy to learn the elements of artisanship, unless in school? Some one has said with, it is to be hoped, large exaggeration, that in America a trade can be learned nowhere except in jail. Why not teach in school the elements of carpentry as well as the elements of book-keeping? Why bias the boy in the direction of an accountant's life, and not in the direction of house-building or cabinet-making? Is the one art more essential than the other?

A boy can be taught in school the use of a plane as well as the use of a pen, the use of the lathe as well as the use of the lexicon. He can be taught the use of tools *scientifically* better than the 'rule of thumb.' He can be taught by a skilled mechanic who is also a skilled teacher, in less time than by a skilled mechanic who is not a teacher. Teaching is an art, and the highest success in it demands more than the simple knowledge of the matter to be taught.

There are in the public schools of the United States more than ten millions of children. We develop their *brain* power, we let their *hand* power lie inactive. It is no exaggeration to say that of these ten millions, soon to become men and women, two and a half millions must support themselves by the labor of their hands. What are the public schools doing to train these hands?

Say what we will, the old Greek was right: "Teach the boy what the man will need." For a nation of horsemen and warriors the ancient Persian education was admirable: to ride, to shoot, and to speak the truth.

It is a remarkable fact — no, it is *not* a remarkable but a very suggestive fact — that the American Indian is taught, in the schools of the American missionary society, exactly what he needs to make him a self-supporting, self-reliant, upright man. The foundation of his scholastic training includes four R's, the fourth being *religion*. These

occupy half his time : in the other half he learns to till the soil, to build his house, to repair his plough and his wagon. But it is remarkable that the white man should give to the Indian child a more comprehensive education than he gives his own. The gravest problem that confronts the American people is the education of the masses. Our wealth has increased, but so has our poverty ; our learning, but our ignorance also ; refinement and joy, but also degradation and misery. The march of civilization has also been the march of vice and crime. "Knowledge fights on both sides in the battle between right and wrong." "The association of poverty with progress," says Henry George, "is the great enigma of our times. It is the riddle which the Sphinx of Fate puts to our civilization, and which not to answer is to be destroyed." Can the riddle of the modern sphinx be solved? Can the diseases of society be remedied? While I am firmly convinced of many advantages arising from hand and brain training, I do not regard it as a panacea. No single agency can bring immediate and permanent relief to the body politic. The mob that cries for 'blood or bread' has passed beyond the influence of the school, and demands a sterner discipline. The hope of the state lies in its youth. Too long have our schools inculcated a taste and an admiration for purely intellectual accomplishments ; at least, have cast a slur on the development of manual skill. By far too many has education been regarded simply as affording an avenue of escape from all labor, as the ability to 'live by one's wits.' We rejoice, then, in the extension in several cities of the public-school course. We believe it to be a broader and a wiser education ; that it is based on a true philosophy ; that it calls into activity powers that have lain dormant, powers of the mind as well as of the body ; that it develops a manlier, more self-reliant spirit ; that it elevates industry, and teaches respect for true manhood and womanhood under whatever guise. We believe that it will materially assist in solving the problem of modern civilization, since, to use the words of William Humboldt, "whatever we wish to see in the life of a nation, we must first put into its schools."

H. H. BELFIELD.

THE REAL-GYMNASIUM.[1]

WHILE in Prussia and North Germany the contest over the relative advantages of the training given in the real-gymnasium and that concerning its rights and privileges has been gradually assuming a very violent character, there has been developed in Wurtemberg a real-gymnasium — the one at Stuttgart — so quietly and peacefully, and so well encouraged by those who in Prussia are the real-gymnasium's bitterest opponents, that the Swabians may rightly be envied for the progress they have made in this direction. This development is described in the work mentioned above, and with the avowed intention, successfully carried into effect, of conciliating the opponents of this new form of school. The author considers himself called upon for these words of conciliation and explanation, from the fact that for twenty years he has been the rector of this institution. Inasmuch as the real-gymnasium in Stuttgart has met with but slight opposition, the author, in his position as rector, has been able to observe quietly the effects which this system of education must have upon his pupils. It is seldom that we see the two educational forces, language and mathematics, with their influences on children, youths, and men, so impartially weighed as in this case.

The history of the Stuttgart real-gymnasium is very interesting for a Prussian, because there the teachers in the gymnasia are its friends, while those in the real-schulen where Latin is not taught are its opponents. It is not possible to enter into this subject more fully, and I will content myself with a few remarks that may induce the reader to refer to the book itself.

In regard to rights and title, the author demands with emphasis that those of the real-gymnasium should be equivalent to those of the gymnasium. The delay in this matter appears to him an injustice, but he does not wish to interfere with the authority vested in the gymnasium. Up to this date the ministers of the interior and of finance in Wurtemberg demand from the graduates of the real-gymnasium a supplementary examination, in which the necessary answers are translated into French instead of into Greek, for entrance to the higher courses of study in their departments, and those who succeed are entitled to follow the studies offered by the faculties of philosophy, natural science, and political economy. To qualify for studying in the other faculties, there is only an examination in Greek, and a translation of German into Latin, required, and not a Latin essay. This is an important concession in comparison with the Prussian demands. The real-gymnasium in Stuttgart is founded for, and expressly appointed to prepare, students who do not study Greek in the gymnasia for entering the courses offered by the above-mentioned faculties, as well as in the technical high schools. It should be a model for all Germany. For once, students have in a very satisfactory manner received

[1] A review of C. Dillman's 'Das Real-gymnasium,' translated for this journal from *Pädagogisches Archiv.*