

CIRCULAR OF INFORMATION

OF

THE BUREAU OF EDUCATION,

FOR

APRIL, 1872.

THE RELATION OF EDUCATION TO LABOR.

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CONTENTS.

	Page.
Letter of the Commissioner of Education to the Secretary of the Interior	5
Introduction	9
"The relation of education to labor." (From the Annual Report of the Commissioner of Education for 1870)	15
Replies from employers, laborers, and observers to questions concerning the value of elementary education to laborers	31
Circular of inquiry	33
Present condition of education among the working-classes of the United States, with a brief statement of attempts at technical and artisan education in England and upon the Continent, by Colonel R. J. Hinton	79
Extracts from the Second Annual Report of the Bureau of Statistics of Labor of Massachusetts, 1871	93
Practical views on technical education; a letter to the Commissioner from Louis J. Hinton. (From report of 1871)	103
Observations upon the condition of education in the anthracite coal district of Pennsylvania. Report to Commissioner by Colonel R. J. Hinton	111

LETTER.

DEPARTMENT OF THE INTERIOR,
Bureau of Education, Washington, D. C., April, 1872.

SIR: Certain questions in relation to the real value of a common-school education to laborers, other questions as to the inadequacy of our present systems of instruction in the common-schools of the country to prepare the children for the pressing demands of active life, and questions as to the present state of education both among the children of laborers and the children who work, from time to time present themselves.

These questions, though diverse, can all be grouped under the one head of "The relation of education to labor," and I have had prepared the following papers bearing upon these related topics, as possessing, perhaps, some value as a contribution toward a solution of the problems.

The papers embrace a collection of replies from laborers, employers, and observers, in reference to the influence of education upon the pecuniary status of the workman; an extract from my report of 1870, treating of a similar series of replies to the same questions; an article by Colonel R. J. Hinton upon the relation of education to labor, and the efforts in England and on the Continent to give special training to artisans; a letter from an artisan, with practical hints, by Louis J. Hinton, (from the report of 1871;) extracts from the Second Annual Report of the Massachusetts Bureau of Statistics of Labor; and a report made to me, by Colonel Hinton, of a tour of investigation among the anthracite regions of Pennsylvania, undertaken at my direction.

I respectfully recommend the publication of the accompanying papers as a circular of information.

Very respectfully, your obedient servant,

JOHN EATON, JR.,
Commissioner.

Hon. COLUMBUS DELANO,
Secretary of the Interior, Washington, D. C.

Approved, and printing ordered.

B. R. COWEN,
Acting Secretary.

INTRODUCTION.

INTRODUCTION.

The relation of education to labor is a question which constantly appeals to the majority of the citizens of this republic of laborers.

The education given in what is known as the American common-school system, by which training in the rudiments of learning is sought to be given to every child in the community, though generally assented to, is not always accepted without opposition, nor does it always receive that hearty support from all classes which is essential to its complete success. That in this respect the interest of the poorest citizen is identical with that of the wealthiest is not always realized by either; and yet it would seem that but little of investigation or consideration was needed to satisfy both classes of this truth.

Again, the feeling that the demand of our modern civilization requires for our children some other and more practical knowledge than simply that of the "three R's," has been for a long time growing.

The community blindly realizes that, in return for its liberal expenditures for the education of its children, something more is needed to prepare them for future usefulness than is given in our present course; that our common-schools should in some greater measure prepare their pupils for the practical work of life; that the motives for attendance should be increased; that the purpose of a common-school education, being the training of all the children of the community for useful citizens, is not fully met. For it is not enough that the child is taught to read or the knowledge of others; all his faculties need to be so trained as to best fit him to take his own part in the varied avocations of life, and this training, so far as his period of attendance will permit, should be begun in the common-school.

The interest in kindergarten, object-teaching, technical, art, and scientific schools, arises from this dissatisfaction with the traditionary training of the ordinary schools, and because they are regarded as an attempt toward a solution of the problem.

If the educational character of our workingmen is to be raised, it must be by the training of their children, in the common-schools, in those habits and that knowledge which will make them more skillful, methodical, and efficient workers in any avocation they may adopt. If it was felt that the common-schools did this to the fullest extent and in the best manner, it would surely not be so difficult as now to retain the children of laborers in the higher classes.

In this day, when so many youths are shut out from the opportunity of learning any useful trade, the necessity for in some measure supplying this knowledge, and fitting the boy or girl to become a self-supporting, producing member of society, is forced upon the community.

As a certain, preliminary, common course of study is deemed useful for those who later in their course pursue separate special courses of training to fit them for their various professions, so it is thought by some that a certain preliminary training in practical knowledge is possible for our public-school children, giving to them some fitness for the work of life without in the least diminishing that elementary knowledge of letters which is justly held indispensable.

In the fierce international industrial rivalries of our day, no nation can hold its own that suffers its artisans to deteriorate. No real improvement of any class or any people is long possible where the training of the children is neglected. As our own country becomes more populous, the struggle for existence grows fiercer, and to meet the demands of life successfully the citizen needs more thorough preparation. Is it beyond the power of the common-schools to afford this—to fit our children for the demands of the life they are to live, the work they are to do, the conditions of the world about them?

The problems of supply and demand, of capital and labor, that have troubled the Old World, come up in the New, and grow more and more imperative.

Knowledge, and the wisdom that comes from knowledge, will give the "power" to compel their solution without injury either to the individual or the community.

Can this knowledge be gained by teaching the children a modicum of spelling, reading, and arithmetic; to use deftly the parts of speech, but with no teaching of the "cunning hand;" by training a people to words rather than works?

Something of the facts concerning the present state of the workmen of this country, of the working-children, and of what is now thought and done toward meeting these difficulties in other countries, is given in the following pages, as an attempt to furnish the public that information which must be preliminary to any intelligent discussion of the questions involved.

In reference to the pecuniary value of the rudiments of education to the laborer, a series of questions was addressed to employers, workmen, and observers, some of the replies to which were included in the Annual Report of the Commissioner for 1870. A number of these replies, received too late for insertion in that report, together with an extract from the summing-up of these various replies, given in the report proper of that year; an article prepared by Colonel R. J. Hinton, on "The relation of education to labor," with special reference to the attempts being made in the direction of technical and artisan education in England and upon the Continent; some extracts from the Second

Annual Report of the Massachusetts Bureau of Statistics of Labor, bearing upon the whole subject of education and labor in that commonwealth; a letter from Louis J. Hinton, with practical hints on artisan education, (from the Commissioner's Annual Report for 1871;) and a special paper upon the condition of education in the anthracite regions of Pennsylvania, prepared, under the direction of the Commissioner, by Colonel Hinton, after a tour of inspection in that district, constitute the following series of papers.

THE RELATION OF EDUCATION TO LABOR.

FROM THE ANNUAL REPORT OF THE UNITED STATES COM-
MISSIONER OF EDUCATION FOR 1870.

THE RELATION OF EDUCATION TO LABOR.

[From the Annual Report of the Commissioner of Education for 1870.]

Agitations of the public mind in reference to questions of labor render the relation of education to the results of industry of special present interest. A tendency to hostility between capital and labor has been apparent. Can either afford to suffer the evils likely to arise from an attempt to adjust the differences by an appeal to force? Yet some form of violent action can hardly be avoided if prejudice and ignorance are too prevalent on either side. The parties in interest are put on an equality of citizenship by the very nature of our institutions. There are no great lines of caste any longer acknowledged; getting capital exclusively on one side and poverty on the other; or education on one side and ignorance on the other. If such an order of facts should occur, it must be brought about by the efforts of individuals or classes. Shall such endeavors be made, or the opportunity for them be offered? The answer depends upon the ability of the parties interested to appreciate the situation and meet its difficulties by ways and means in accordance with reason and conscience.

There is offered here in America the fairest field for the successful solution of every irritating question arising between capital and labor, without conflict, without harm to either, without a disturbance of the great harmonies necessary to the highest national prosperity. But reason cannot exercise its sway without knowledge, nor knowledge be possessed without the means for its acquisition. Capital and labor must be both able and willing to see and consider each other's interests. Make all of either class able to read, able to discriminate correctly between right and wrong; render intelligence and virtue supreme in deciding their questions of individual interest; lift them up, so that the horizon of each will embrace the interests of all, and the folly and wickedness of an appeal to force or fraud on either hand will be too apparent to invite the attempt. They would then see how much they have in common; how closely and inseparably they are yoked together. Education, in its largest sense, the development of all the powers of man for the best uses, offers to each interest the grand instrument for the solution of its difficulties.

With this belief, strengthened by the conviction that no question could be more thoroughly national or pertinent, I have addressed a series of inquiries, first, to observers; secondly, to workmen; thirdly, to employers, calling for an expression of opinion upon the relation of education to the productiveness of labor. The necessity of the inquiry is

strongly enforced by the flat denial on the one hand that education adds to the productiveness of industry; while on the other, the effort to place this matter beyond controversy is ridiculed as raising questions already long since answered in the affirmative.

Copies of these inquiries were prepared, intended to offer the opportunity of bearing testimony in regard to the points raised, which were sent to every class in every section of the country. Only an attempt to open the investigation is made in this report. An accompanying paper is presented upon the general subject of education and labor, written by one specially interested in the question.

The first question of the series related to the opportunities of the person interrogated to judge correctly, so as to be able to answer the remaining questions; being as to whether he had employed any number of laborers, how many, in what kind of labor, and where; with appropriate variations when addressed to workmen and observers.

The other questions are as follows:

2. Have you observed a difference in skill, aptitude, or amount of work executed by persons you have employed, arising from a difference in their education, and independent of their natural abilities?

3. Do those who can read and write, and who merely possess these rudiments of an education, other things being equal, show any greater skill and fidelity as laborers, skilled or unskilled, or as artisans, than do those who are not able to read and write; and, if so, how much would such additional skill, &c., tend to increase the productiveness of their services, and, consequently, their wages?

4. What increase of ability would a still higher degree of education—a knowledge of the arts and sciences that underlie his occupation, such as a good practical knowledge of arithmetic, book-keeping, algebra, drawing, &c.—give the laborer in the power of producing wealth, and how much would it increase his wages?

5. Does this and still further acquisition of knowledge increase the capacity of the workingman to meet the exigency of his labor by new methods, or in improvements in implements or machinery; and, if so, how much does this inventive skill add to his power of producing wealth?

6. Would you generally prefer or not a person who has been trained in the common-school for the ordinary uses for which labor might be employed over one who has not enjoyed that advantage?

7. Whom would you, as an employer, choose for positions of trust, such as foremen or superintendents, persons unable to read and write, or those having the rudiments of education, or those possessing a superior education, all other things, such as skill, strength, and fidelity, being equal?

8. What do you regard the effect of mental culture upon the personal and social habits of persons who have been in your employ? Do they, as a class, live in better houses, or with better surroundings? Are they more or less idle and dissipated than the unttaught classes? How will they compare for character, for economy, morality, and social influence among their fellows?

ANSWERS.

By Sinclair Tousey, esq., New York City, who had employed farm-laborers, clerks, porters, and similar help for more than thirty years:

3. Difficult question. The difference, in my opinion, would be from 20 to 40 per cent. in favor of those possessing the rudiments.

4. This would depend upon the labor he had to perform. If merely muscular was all that was expected, these qualifications would add but a small extra value to his labor; but if they were required, a large per cent. of difference would be in favor of the man having the qualifications, though in any case the increase of wages would depend greatly on the laws of demand and supply for work and worker.

5. Yes; but the amount of increase depends entirely on the nature of the things produced, by the improvements, and the extent of the want of such things. The more universal the want, the greater the per cent. of advantage in favor of intelligently, educated laborers.

6. Yes; by all means. Untrained brains are but poor instruments in guiding untrained muscles.

8. Such men are always looked up to by their uneducated fellows.

By General Samuel Thomas, Zanesville, Ohio, who has employed five hundred common and skilled laborers, such as were needed to produce merchantable iron from the ore and the coal in the mines :

2. A marked difference, and easily observed by visitors.

3. None of our officers doubts the superiority of men who can read and write, for common labor, over those who can't. Men who have some education require less supervision. The saving to employers in this way alone amounts to fully 10 per cent. Employers suffer constantly from ignorant employes doing their work poorly, and doing less of it for the same wages. This amounts to fully 10 per cent. more.

4. A knowledge of chemistry, geology, working of mines, and, in fact, all the physical sciences, would add to the efficiency of all laborers in our employ. Not that I expect all to advance to the higher departments, but that, with their common-school education, they should have some knowledge of the sciences I have named. In many ways men with such advantages could produce more in twenty-four hours with no more labor, and, as a consequence, command higher wages.

5. All the labor-saving improvements are the result of education awakening the mind to struggle for something to save much, and throw the labor upon machines of iron and wood, so far as I have observed in our works. The ignorant man imitates some one else, and, if he is watched, continues to do so day by day, and by these means earns his living, but he is a great tax upon capital. We pay 20 per cent. more wages to a skilled laborer in our employ, with an education that makes him worth it to us, over an uneducated man struggling to fill the same kind of place, but not worth so much.

6. I should much prefer a man with some education; the more the better.

7. I would not employ as a superintendent or foreman a man who could not read and write; all other things being equal, consider a man better and better qualified for supervision of labor as his education increases.

8. The man with some education or some mental training shows his superiority over the ignorant man at home, and by his social and moral influence, to a greater degree than in the shop or at labor. He is more moral, less disposed to be vicious, more industrious. As a class, they live in better houses, have better surroundings, and seem to be happier men in every way.

By Mr. John W. Browning, bricklayer, president of his trades-union and secretary of the National Labor Union, New York City; his general statement is intended to answer several of the questions :

I have not unfrequently worked with members of my trade who have labored years at the business, and yet they are ignorant of the simplest though very important materials in the building line. For instance, anchors are fastened to every fourth or fifth beam, and must be, or should be, well secured in the wall, by which means there is a bond between the two walls, or four walls, as the case may be; the walls are strengthened, the building is firmer and less liable to settle. The men I allude to build around

and over these anchors, wondering what they are there for and paying no regard to security. Such mechanics are half their time unemployed, and they attribute it to hard luck, or something of that kind; but they do not seem to take heed and get on, and they become discouraged. But it is not so with the mechanic who understands the theory of his business, or who has studied sufficiently to discipline his mind. He understands or will understand, that the anchor must be set snug in the wall. He knows why a fireplace is built on the outside of a gable. He knows what a keystone is for. In short, he knows the uses of the materials and the designs of the specifications, and he is able to earn his wages, and in many cases superior wages, besides enjoying steady employment during the building season. The latter class of our trade are the students of our business; they lighten their labors and the labor of others by new inventions. A year ago 1,000 brick a day was considered a fair day's work. It is the basis of estimate at the present time; and yet an ordinary bricklayer can lay from 1,500 to 2,000, while I have known men to lay 3,000 a day on a twelve-inch wall. I think any one who has adopted any means to discipline the mind, either by studying at school or elsewhere, is preferred to one who never gave himself to reasoning.

7. It depends on the business to be transacted. In my business a foreman, superintendent, overseer, or journeyman cannot know too much, and those who are trusted with the plans are skilled and as intelligent as can be had.

8. I find men who are in the habit of reading the daily papers soon become well informed. They take an interest in passing events. This brings respect and then self-esteem, pride, and all that; they are more industrious; they can account for change. By the experience of the past they judge the future; they are better providers; live as well as their means will allow; they are always trying to better their condition, and they have an influence among their associates. I am in favor of free day-schools for children, free night-schools for apprentices, free libraries and better rooms for all who wish to avail themselves of their benefits, believing that it will add to the industry of the nation, elevate society, and make us morally and religiously a better people and better citizens.

A. J. Mundella, esq., member of the British Parliament for Sheffield, England, who had employed a large number, as many as three or four thousand at a time, in the middle counties of England, as knitters, weavers, finishers, and machinists:

2. I would say that an educated man invariably acquires a knowledge of his work with greater facility, and executes it with less cost of supervision, than an uneducated man.

3. The mere rudiments I do not rank very high. If a man can barely read and write, he has not attained to much. To read and write *fluently* is a great advantage in conducting the ordinary affairs of life. Evidence has been given before the British Parliament, from my own district, showing that some grave mistakes in chemical processes, such as bleaching, dyeing, &c., are constantly occurring through the ignorance of the workmen, they not having the ability to read writing. I have often witnessed natural powers in a person entirely uneducated, which would have been turned to the benefit of himself and his employer if he had only received a thorough elementary education. I have recently seen in Massachusetts, Englishmen whose wages their employers would have doubled, by willingly appointing them overseers, if they had only been educated sufficiently to keep accounts.

I think it is impossible to estimate how much education would increase the value of their services. If the labor is merely mechanical, such as tending a machine that is making so many revolutions per minute, it requires little education to perform it; but if the labor is something where the whole manipulation depends upon the intelligence of the workman, it is a very different thing. The division of labor in England is so minute that the artisan who begins and continues the same work for years becomes a mere machine himself.

The value of education, both to the workman and employer, is something that it is exceedingly difficult to estimate. The educated man will better understand the influence of those economical laws upon which his art depends than the uneducated; and my observation leads me to the conclusion that many of the strikes among workmen are the consequence of gross ignorance on their part, and that almost invariably the outrages and intimidation resulting from strikes are the acts of ignorant men.

The more flagrant cases of violence and intimidation in England have been in connection with those trades-unions where the education of the workman has been grossly neglected.

4. I believe that technical education is of great importance; that the success of Switzerland and Germany in manufactures, and their superiority over others for the last thirty years, has been owing to the excellent elementary education which they have given to their work-people, to which has been superadded, with great advantage, a large amount of scientific and technical education.

Art-training in England has had a marvelous effect in improving the designs for every description of manufacture where taste is required, and consequently in increasing the demand in foreign countries for such manufactures. For example, the result is seen in the better styles of carpets, laces, dress-goods, crockeryware, furniture, ornamental iron-work, and in every manufacture where decorative art is of value. I think the great want in this country is such education. I have known instances where a youth who has received art-training has been able at twenty years of age to earn more than all the rest of the working force of his father's family. There is one case among my own workmen where such a lad is getting very high wages, and the effect is that the whole household is elevated.

5. The greater the improvements in machinery the more intelligence is required on the part of the workmen who manipulate them. It has been found in England that for working the improved agricultural machines a higher class of intelligence and skill is required to manage them than the old peasantry possess. An intelligent workman will always produce a larger amount of work from a clever machine than an ignorant man can, and will keep his machine in better working condition.

6. I would, certainly. In all classes of labor with which I am acquainted a person receiving the education which is open to him in the common schools of America would be infinitely preferable, in all respects, to a workman whose early education had been entirely neglected.

7. Certainly, I should prefer those who have had the very best education for such situations. In my opinion, a youth cannot be too highly educated for business purposes. I believe there can be no greater mistake than the old and common error that a boy may be made above his business by education.

8. My experience of workmen, on the average, is that the better a man is educated, and the greater the intellectual resources he possesses, the less is he disposed to sensual indulgence, and the less inclined to any kind of intemperance and excess. Those trades most characterized by intemperance in England are those wherein the workmen employed have the least education. I have employed in various departments of my own business intelligent workmen earning lower wages than ignorant men employed in coarser branches of the business; and the intelligent man educates his children, lives in a comfortable house, and has much refinement and many pleasant surroundings; whereas the ignorant man, with higher wages in some other departments of labor, is more addicted to intemperance, his wife and children are worse clad and worse cared for, and his home, in all respects, less comfortable. Perhaps the best illustration of this would be the contrast between a clerk earning £80 a year, who is a gentleman in education, tastes, and surroundings, and an ignorant laborer earning the same sum. In England, intelligent workmen are generally the men who are distinguished for economy and thrift. They take the lead in all useful associations; they are the managers of the mechanics' institutions, the teachers in the Sunday-schools, and the founders of co-operative societies.

In my experience in courts of conciliation, I have always found the intelligent workman more open to conviction, less trammelled by class prejudices, more independent, and possessing more individuality than his fellows. The ignorant workman, on the contrary, is much less qualified to sit on the boards of arbitration.

Mr. W. J. McCarthy, working miner and engineer, of Saint Clair, Pennsylvania, writes as follows:

I was born in this county. Ever since I came to years of understanding I have taken notice of the foreign emigrants, of whom we have a goodly number here. I have found the ignorant and uneducated the poorest of them all. I have had occasion several times to travel through the coal region. I found the uneducated living with their families in mud-hovels and shanties, while the educated preferred living in towns, where their children would have all the advantages of civilization and education. Were it not that this mountainous country is so healthy, the mortality among the former would be very great, for the manner in which the poor, ignorant creatures manage to live without entailing disease is miraculous. Dissipation is also very great among the uneducated, more so than among those who are educated; and it would be still greater were they to have the means to purchase liquor. I have often heard poor, ignorant men say, "Were I as rich as so and so, wouldn't I sport?" Men sometimes get rich by chance, and, if they have not at least the rudiments of education, as a general thing become dissipated. I also observe more brutality among those who cannot read or write than those who can, and also more debauchery, crime, and tendency to evil.

Having in charge the machinery of a large coal-breaker at one time, I observed that the boys that never went to school, and could not read or write, were more mischievous, and would oftener try to damage the machinery by putting spikes or pieces of iron in the cog-wheels, than the boys who had been at school and received even a slight education. These are my reasons for thinking that an educated workingman is so much superior to the uneducated. Education is needed for the welfare of any nation, for without it we would become barbarous.

Cyrus Mendenhall, president of the Kenton Iron Company, Newport, Kentucky, says:

I rejoice that the official attention of the General Government is being turned to the subject of your inquiries, and cannot but hope that sooner or later it will result in some practical benefit to the country. The want of a higher grade of instruction in the science of their business, for the managers of the different departments of the manufacture of iron, say in mensuration, geometry, the mechanical powers, hydraulics, hydrostatics, chemistry, &c., has been severely felt by proprietors. The want of competent men in such positions often, I believe, makes the difference to owners between success and failure.

In illustration or justification of my replies to your Nos. 3, 4, and 5, I will take the liberty of giving you an instance or two coming under my own observation: An engineer at our blast-furnace near Wheeling—a man who had previously been intrusted with important machinery, and run an engine successfully when all was right, a temperate and well-meaning man, but without education, except to read and write and make the simplest arithmetical calculations—was directed to place a hand force-pump at the river, and have water driven up to the tanks, located 60 feet above the river level; a half day, with two assistants, was spent fixing the pump on the river bank 40 feet above the water, with a soft-hose from the pump to the water, and another from the pump to the tanks. He did not know why he was unsuccessful in getting the water into the tanks. It was difficult at that time (owing to the war) to replace him with a better man, and he was left in charge of the machinery when the furnace went into blast. The machinery was vertical, the steam standing above the blast-cylinder, the whole extending in a line some 27 feet above the foundation. Considerable vibration at the top was found to result from the movements of the machine when put to the

necessary speed. Instead of remedying this by guys from the top to the strong surrounding walls, during a fortnight's absence of the superintendent, the engineer applied one timber-brace, setting the top over the whole, or little more than the whole, amount of the vibration, thus forcing it out of line, and causing such injury to the inside of the cylinders, from cutting of the metallic piston-heads, that the blast-cylinder (and I think the steam-cylinder also) required to be taken out and sent to the manufacturer, a hundred miles distant, and the whole put in repair, at a cost of \$2,000. This, with the damage arising from stoppage, was more than sufficient to have paid the wages of a first-class man, instructed in the "science" of his business, for two years. That man is still employed in the same position, at a blast-furnace, on the Ohio River, above us.

Now for another kind of a man. In a part of the country where the services of a railroad engineer were very difficult to procure as well as very expensive, it was necessary to construct two or three curves to a definite radius in a short railroad extending from the coal mine to the main line of railroad. An employe, who knew nothing of engineering, but had mastered the first six books of Euclid, by an evening's study and application of the geometrical principles involved, discovered the very rule and method used by the best engineers, and next day, with the aid of a transit, located the curves with correctness and dispatch. How much was such a man worth above an ordinary hand?

Mr. S. P. Cummings, of Boston, Massachusetts, secretary of the Massachusetts Grand Lodge of the Order of St. Crispin, chairman of the executive committee of the International Labor Union, and of the State Labor party, says:

2. The difference is very marked, indeed. Educated labor is by far the most skillful and faithful. Value of skilled labor over unskilled, both as to productiveness and compensation, fully 20 per cent.

3. A knowledge of the subjects would increase production and wages fully 20 per cent. over the present, inasmuch as the effect would be to stimulate laborers to produce better articles, and consequently increase their means of enjoyment.

4. It does. It is difficult to determine. I should say 20 per cent., as the result of my observations in fifty cities and towns in this State.

5. Most certainly he would by intelligent employers.

6. I have a large personal acquaintance among manufacturers, and they generally agree that their foremen's money-value depends largely on the education they possess. To this rule there are some exceptions, of course.

7. Inventive culture, as a rule, increases the self-respect and improves vastly the social habits of workingmen.

Educated workingmen live in better houses, have better surroundings, and are in all respects superior to those whose education is limited and defective. They are less idle and dissipated than the untaught classes. As regards economy, morality, and social influence, educated laborers are pre-eminent among their fellows. I may add one general observation, that while I was foreman of a shoe-factory, employing forty hands, I always got better work, had less trouble, and, as a general rule, paid better wages to the more intelligent workmen. The more ignorant hands were continually giving me trouble, either by slighting their work, or failing to appear in a fit condition to work after pay-day. They were, many of them, coarse, vulgar, drank liquor, grumbled, and were in all respects disagreeable.

I am so well satisfied of the inestimable value of education to the laborer that I would make it compulsory. No man should be allowed to go into the arena of life until he has at least a decent English education. A class of uneducated laborers in a community or State is an ever-present element of danger and injury not only to labor but to the State itself; therefore, sir, I am much pleased to see that you are collecting statistics for the information of the Government and people on the subject.

' My observation has been, and my opinion is, that educated labor is the best paid; that the several habits, style of living, general character for thrift and enterprise of our educated laborers, are so clear as to admit of no question. I cannot particularize on the subject; I can only give general results. Had I more time now, I would like to add some observations on what I regard as defective in our present system of education. Visiting, as I do, the different parts of the State, I observe from necessity the habits of workmen, and will at some future time, if you desire, give my experience more in full.

Mr. A. E. Johnson, (workingman in shoe-shop,) of Haverhill, Massachusetts, says :

There are many instances in this city of first-class workmen who can neither read nor write, but they are exceptions to the general rule. They may be good at their particular part, but not so quick to learn any new part.

Miss Martha Walbridge, of Stoneham, Massachusetts, head of the Daughters of Saint Crispin, (trades-union,) says :

2. I unhesitatingly reply in the affirmative to the first question. As to *how much* such additional skill would increase the productiveness of their service, &c., I would state it certainly as much as 20 per cent.

3. The ratio is certainly great, and I am so sanguine on this subject that I would state the increase of ability would give the laborer *double* the power. As to *what* knowledge would be most practicable, I would offer, as a substitute for book-keeping and algebra, natural and intellectual philosophy; and my observation teaches me that these sciences are absolutely essential to the welfare and progress of the laborer.

4. Most emphatically it does. For who so stupid that will not exercise the little wit he may have to economize his physical strength. How much this inventive skill adds I feel incompetent to judge.

5. Certainly, unless the employer be a thief or rascal.

6. Rarely have I known an illiterate person employed as foreman, and when such cases have come under my observation, the persons thus employed have never been able to retain such position, on account of their incompetency.

7. Mental culture has a salutary effect on the habits of working-people. It has a direct tendency to morality and refinement. It assuredly develops itself in a desire and healthy effort to secure for themselves and families better homes and intellectual enjoyments. A sense, once attained, of the true dignity of manhood and womanhood is seldom, if ever, lost sight of, but retained and fostered as the poor man's one only priceless jewel, and this sense and noble desire make him an honest and respected citizen.

Respecting modifications of the common-school system, which have been suggested as corollaries to the answers to these questions, I may add a few words.

First, as respects the ordinary whole-day system, Mr. Edward Atkinson, of the firm of Loring & Atkinson, of Boston, Massachusetts, gives an account of the very great success of a half-time school for the children of the Indian Orchard Mills, established by and connected with the school system of Springfield, Massachusetts. In this school half the children work six hours in the morning, and attend school three hours in the afternoon, and the other half go to school three hours in the morning, and work six hours, partly in the morning and partly in the afternoon. Under this arrangement Mr. Atkinson is of opinion that the children "work better and learn more in each hour than those who work or

attend school full time," and says that the opportunity attracts the best families to the mill, so that the proprietors have "philanthropy, without almsgiving or charity, combined with better profits." Some very remarkable specimens of chirography by children, originally of very small acquirements, who have attended this half-time school for six and twelve months, accompany Mr. Atkinson's letter.

Edward Winslow, of Boston, Massachusetts, the general agent of the Industrial Aid Society for the Prevention of Pauperism, suggests, in reference "to *practical* education in this country *pari passu* with theoretical, that we are greatly deficient in this respect as compared with all other civilized nations, for we have but few technical or trade schools, and those few are designed for a higher class than that which our society hopes to reach. * * The school at Kensington, established by Prince Albert, has been of infinite value to England, not only in cultivating the taste and skill of her artisans; for the export of manufactured articles traceable to that school amounts to £70,000," (or \$350,000.) "A few years ago (1863) only 3,000 students were instructed in the art and technical schools of Paris; in 1867 there were 12,000; and in 1869 there were 350 *schools*." After some observations on the superiority of the educated workman in the ease with which he learns his trade, the improvements in machinery and manipulation that he can make, and the rapidity and perfection of his work, Mr. Winslow goes on to say :

The greatest benefit to be conferred upon our country is to make mechanical and industrial pursuits more respectable, and to educate and train the young for these pursuits. Our systems of instruction are now altogether intellectual, and even this only goes far enough to give the pupils a distaste for manual occupations.

He also suggests the importance of retaining, as part of the system of public education, "moral culture and religious instruction," which "need not be sectarian;" and he closes his letter by saying that "the greatest obstacles to prosperity are found," by the society he represents, "to be want of both moral and mental training in the individuals that come under their care."

Professor J. W. Burns, secretary of the American Artisans' College, of Philadelphia, Pennsylvania, writes respecting "the practicability and utility of mechanical and artistic instruction in common-schools." He believes that "to make work of the hands and the mind combined a leading feature is absolutely necessary to render education an efficient means of mental development and culture. As a vast part of the community depends upon productive occupations for means of subsistence, instruction of children should have for its chief object the development of the faculties which most facilitate mechanical effort." In all the schools he has been connected with he finds "that the most intractable boys may be induced to work, and, when the labor is not continued long enough to fatigue, will go to it with pleasure." "Setting type is one of the best exercises in orthography in which a learner can engage." By the "pantagraphic system of instruction, children from five to ten will

learn the rudiments of language and sciences pleasantly and rapidly; and if a fair portion of their time from ten to twenty be given to useful work, they may be taught mechanic arts thoroughly," &c. "Much of the expense of education may be paid by the work of the pupils."

In support of these opinions he mentions various interesting items respecting the attendants of the American Artisans' College. He believes both intellectual and moral culture may be stimulated by awards of honors, decorations, degrees, &c., for proficiency, good conduct, &c., to all students in school who seriously endeavor to improve.

In the article upon "The relation of education to labor," which I have had prepared as an introduction to the responses from employers, workingmen, and observers to the series of questions sent out from this Bureau, bearing upon this subject, will be found a condensed summary of the special schools established and supported by the different European governments for the training of their citizens in the arts, sciences, and industries of life. A glance at what is done in this direction by the little Kingdom of Württemberg, with its population of less than two millions, or by the Republic of Switzerland, with its twenty industrial schools for girls, is sufficiently suggestive of our own deficiencies.

The extracts from the report of the British workmen who were sent by the London Society of Arts to the Paris Exposition of 1867 are full of interest, more especially in view of the great effect that was produced by them upon the English manufacturers, who were then made first aware of the danger they were in of losing their boasted supremacy, from their lack of trained laborers, and who have gone to work with their usual energy to remedy the fault, by establishing training-schools in the arts and industries, the good effects of which are already visible.

In the extracts from a report to the Massachusetts Legislature, the statement that "there is *no remedy* for the wrong of depriving children of a proper education," and the assertion that the public-school system of New England, so well adapted to a former state of society, *fails* to meet the demands of our modern civilization, contain both the *rationale* of free public education by the State and the indictment of the thinkers of to-day against the present system.

The remarks of Dr. Lyon Playfair, at a recent meeting of the British Social Science Association, with which this introductory article closes, would seem to sustain this indictment, and at least challenge attention.

In the answers returned by the employers, workingmen, and observers to the circular-questions sent out by the Bureau in reference to the effect of education upon industry, as to its giving increase of compensation, and in its general effect upon the condition and value of the laborer as a citizen, from the mere rudiments of knowledge up to the higher technical culture, many interesting facts were elicited, some curious discrepancies and differences of opinion appear, and now and then the underlying problems of political economy, the complex relations between capital and labor, are here suggested and there thrown into sharp antagonism.

These answers come from every section of the country and from those engaged in various industries; and in the kind of industry there is found a reason for the difference in the estimate of the value of book-learning, the builder of complex machines seeing far more worth in the higher education of the laborer than the superintendent of the Kansas Railroad, who finds the possession of a certain innate power over men, by his foreman, of higher value than the best education. In the replies of employers, from those requiring great mechanical skill to those dealing with plantation hands, save a few who exclude the colored laborer from the application of the rule, the common testimony is, that ability to read and write adds to the value of the workman and to his pay; the more ready comprehension of directions, the less supervision required, and the ambition of the educated man to rise to do better, being the chief reasons adduced. The rate of increase of wages runs from 10 to 100 per cent., averaging in ordinary cases from 20 to 25 per cent.

In replying to the question as to whether increased knowledge, such as practical knowledge of the sciences underlying his occupation, would add to his wealth-producing power and to his wages, there is a remarkable unanimity, though the replies of the employers show inferentially how rarely such knowledge is found among their employes. The effect would be to lift the man at once up into another and far better paid class, the increase of wages being doubled and trebled over those of the untaught laborer.

In replying to the question as to the increase of knowledge creating inventive ability in the laborer, the problem becomes more complex, as is evident from the limitations expressed by the answers; but the fact remains that, of necessity, increased knowledge avails here in a marked degree; only, to be successful, the inventor needs not only knowledge but will and creative ability.

One employer finds the capacity to do mischief by strikes, &c., increased by training.

The replies of the workmen to the same series of questions are of far more interest than those of the employers, because presenting the subject in a greater variety of views.

The illustrations used by the answering workmen are nearly always remarkably apt and clear, not involved, but distinct and sharp, and generally drawn, of course, from the avocations they pursue.

As to education giving increased skill and aptitude, the testimony of the workmen is that it does almost universally; one remarking that in the business of iron-molding, where generally it is least supposed to be of consequence, this result is to be most observed.

As to an ability to read and write conducing to increased "fidelity" and "skill," also to increase of wages, opinions vary, though most agree that it would increase them from 10 to 20 per cent. One great value of so much knowledge is, that those able to read the facts for themselves are not apt to be so unreasonable in their demands, or to

engage in strikes; but, knowing the markets, know that increase of wages at a given time is impossible. One writes that "How cheap will you work?" not "How much do you know?" is the question asked by certain employers, and his opinion is that knowledge has little to do with wages. Yet the same authority, in replying to the next question, "As to how much more knowledge will increase wages," bears full testimony to the value of an acquaintance with arithmetic to miners, the class of whom he speaks. So it seems that in this labor to simply read and write is not enough; and his answer, seemingly undervaluing this knowledge, is but a strong plea for more education. Most treat fidelity, faithfulness, and honesty, as matter independent of mere knowledge of the rudiments of education; as moral qualities which are possessed in as high a degree by some who know nothing of the rudiments of education as by those who do. One argues against education increasing the "fidelity" of the laborer, because education enables him to appreciate the wrongs inflicted by capital upon labor, and therefore will not be likely to increase his "fidelity" to those whom he considers his oppressors.

To the query as to the effect and value of still higher education, a knowledge of the sciences that underlie his occupation, the answers are very varied, and treat upon nearly all the related questions in the contest between capital and labor. One replies that it would enable a mechanic to take his own contract and receive all the profit coming from his labor; in other words, though the writer does not say it, it would transfer him from the rank of those who labor for wages to that of the employer. Another thinks it would increase the wealth of the employer but not of the laborer.

"Mr. Sampson likes his coolies because they are docile and cheap—not because they can read and write."

Another finds a drawback in that a youth with this education, fitted to make him a superior workman, thinks it menial to learn a trade; this idea is expressed in different forms by several.

Another states that a thorough knowledge of the material in which an iron-molder works, for instance, would enable him to produce the same results with one-third less labor; but would not necessarily increase his wages. A distinction is drawn by several between the additional wealth-producing power and the increased wages of the laborer.

In answer as to whether the increase of inventive skill keeps pace with increase of general education, one states that during the past four years the production of a given number of mechanics has at least doubled from the improvement in tools. Another says, "It is well known that all labor-saving machinery is the product of the brain of the educated laborer; but for forty years it has resulted in neither less hours for labor nor less physical labor to the laborer. The educated laborer of to-day works as hard and as many hours as the laborer forty years ago—the 'labor-saving' being money only to those who labor not."

All the replies admit the value of education to any one with inventive faculties, though not conceding the whole credit to the fact of education alone.

As to educated persons being preferred for superintendents, foremen, &c., most of the replies concur that they are, but assertions are made of cases to the contrary. Some employers select men of brute force to dominate over their laborers, but the emphatic bitterness with which these facts are stated would seem to show that they are exceptional.

As to the effect of education and culture upon the position and influence of the laborer, the testimony is confirmatory of its value. One believes that the large proportion of criminals are *children of ignorant parents*; another points to the fact that but one in ten of the convicts of New York State is from the mechanic and laboring classes; another finds great advance in the condition of the laborer through the spread of education, and looks to the reducing of the hours of labor to the lowest possible amount as the only hope for increased refinement of that class; another considers this reduction of the hours of labor "the great question of the day;" another would have every child compelled to go to school till the age of sixteen years—a portion of each year at least; another admits the great power of education in elevating the class of workmen in all respects, but says, "All is lost in the knowledge that a corrupt government legislates entirely for capital and nothing for honest labor."

From the observers these questions draw forth very different replies from those given by the actual employers and laborers, not in regard to any of the technical questions, as to the general improvement produced by education, but in the reflections induced and by their deductions from the facts.

The question of the kind of education to be given is earnestly discussed, and the omissions which they charge to the common-school and high-school system are forcibly delineated. The absolute need of technical schools, of furnishing education closely related to the industries of all persons who must work, is strongly presented; while the philosophy of the advantages of education to the laborer is clearly stated by another observer: 1st. In the independence it creates. 2d. In the withdrawal from a lower to a higher sphere of labor, and in thus diminishing the number of the mere laborers, and so increasing their wages, wherein lie some of the secrets of the worth of education.

But not mere knowledge of rudiments, not facility in mere exercise, but in the progress of technic art, and in the habit of right-thinking and conscientious conduct, are the hope and progress of the American workman.

From the testimony thus given by various classes, from all sections, and among many industries, it is clear that the worth of a common-school education to the common laboring man is universally conceded, with the single exception of those speaking of colored laborers; that

his value to the community at large is positively increased and his power as a producer, of adding to the common stock of wealth, is materially enhanced by the education given him as a child in the common-school. The increase of wages he will receive on account of his knowledge is put at various figures, averaging near 25 per cent. That this increase of value arises, 1st, from the fact of his being more readily instructed in the duties of his work; 2d, that he needs less supervision; 3d, that he does his work to better advantage, and therefore produces more in a given time; 4th, that he is less liable to join in unreasonable and unseasonable strikes; 5th, is more industrious; 6th, less dissipated; and, lastly, is less liable to become an expense to the commonwealth through poverty or crime.

That this (which is true of the commonest laboring man who knows little more than to read and write, but who, knowing this, possesses a marked superiority over his fellows, who are ignorant of these simple rudiments and means of acquiring knowledge) also holds true in regard to additional acquirements, is likewise fully shown.

That a knowledge of the sciences that underlie the occupation gives greatly-increased value to their possessor as a laborer is agreed on all hands; no answer so far excepts even the colored laborer. It does this, 1st, by enabling him to avoid dangers, in mining, for instance, to which ignorant men are exposed; 2d, by enabling him to detect and remedy difficulties, which else would cause expense or delay; 3d, by enabling him to discover shorter and simpler methods of work, thereby increasing his powers of production; 4th, by stimulating his qualities of contrivance, so that he adjusts and modifies the tools or machines which he uses, and becomes eventually an inventor of simpler and better machines, thus increasing the wealth-producing power not only of himself, but of his fellow-laborers. In this direction it is estimated that his value is increased 100 per cent., while in certain exceptional cases the gain is incalculable. But after admitting all these arguments in favor of the increased value of the laborer who possesses this higher education, it is clear, from the evidence of all, that the chief value and greatest advantage of such increased knowledge arise from the fact that it advances the well-being of its possessor. By virtue of increased education he commands higher wages for his services, and also adds largely to the common production.

Looking merely at its economic value, these answers go to prove that the community receives an ample return for whatever of money it invests in the education of its citizens. Since this is demonstrated, it adds force to the arguments now being urged for technical education, for special training in the several industrial fields; for, if the teaching of the simple rudiments and general instruction give so rich a return to the state, how much greater and more certain results may be relied upon from special training for special labor. This question, which has been so fully tested by the technical schools of the European govern-

ments, is attracting attention here, and we are not surprised that dissatisfaction is openly expressed that the high-schools furnish no opportunity for training in the practical industries of life.

The argument, as stated here, rests on an entirely different basis from that presented by the professional man, mortified that his country possesses no schools for professional training equal to those of Europe.

This is the plea of the citizen who finds in the higher branches of the public schools an utter failure to give that training which fits for varied practical occupations. The point is well taken, and merits consideration. It is a plea for artisan, art, industrial, and scientific schools as a part of the common-school system—a plea based upon the economic value to the state of such training to its citizens.

The questions of the hours of labor, of the relations between capital and labor, of the importation of cheap Chinese labor, of the alleged discrimination in legislation in favor of capital and against labor, all come up in varied forms, and show an activity of thought among the workmen which will require to be met by intelligent argument, if we would avoid in this country that impending conflict between the producing and capitalist classes, to avert which is occupying the thought of the ablest minds of the Old World.

These questions cannot be ignored, and the only safe solution of problems so complex and so vital lies in the general dissemination of education among all citizens of the state, so that the capitalist shall be taught as well as the laborer, (and in this country the classes and terms are continually interchangeable, the laborer becoming capitalist, and often, by sudden reverse of fortune, the capitalist becoming laborer,) and that all shall come to see that there is no necessary antagonism between these fellow-workers. For the interests of the laborer rest everywhere upon capital, which is nothing but the sum of surplus labor, and that capital is vitally interested in the improvement, intelligence, and prosperity of the laborer.

To short-sighted, grasping capitalists and ignorant laborers this often seems the reverse of the truth, but the repetitions of history again and again demonstrate its unchangeable verity. As labor emancipates and owns itself, health and prosperity come to the nation; as it is enslaved and owned, the capitalist becoming stronger and the laborer weaker, luxury increases and the semblance of prosperity deceives the nation; but this false semblance of strength meets with sudden catastrophe, as yesterday with the slave system of America, to-day with the hollow pretension of imperial France.

It is this danger, inherent to labor which can be controlled in mass, which arouses the instinctive hostility of free laborers to importation of Chinese contract-labor. It is clear, from the answers drawn out by these simple educational questions, that all classes are interested in education, and that the subject includes many topics and is linked with all political and economic problems.

This report goes to press while the answers and opinions coming in from all quarters of the country are increasing in interest. My hope is that they will continue to come until every inquiry sent out has been answered.

Then, should it be possible, I expect to use all the material in hand in treating this and the related questions toward which so many of the answers have so naturally directed attention.

The special need of this will be most felt by those who know best the strong but exceptional convictions prevailing in many minds, that it is injurious and dangerous to give colored laborers a rudimentary education, as noted above.

However faulty or blind any of these opinions may be in our judgment, it becomes us, in view of the gravity of the interests at stake, to bring the whole subject under the widest and most correct observation and examination, both as regards facts and opinions, that truth may have a fair chance at every honest mind, and correct ideas of what education is, and of what its benefits are to all races and classes, may be universally disseminated.

REPLIES
FROM
EMPLOYERS, LABORERS, AND OBSERVERS,
TO
QUESTIONS CONTAINED IN CIRCULAR OF INQUIRY
FROM BUREAU OF EDUCATION,
ON
VALUE OF ELEMENTARY EDUCATION TO LABORERS.

INQUIRIES AND REPLIES RELATING TO FOREGOING PAPER.

Circular of Inquiry.

DEPARTMENT OF THE INTERIOR,
Bureau of Education, Washington, D. C., October, 1870.

SIR: The object of this Bureau in making the annexed inquiries is to ascertain your views with regard to the effect of education on industry, all other things—as natural ability and length of time employed in a given pursuit—being equal.

It has been claimed that the mere ability to read and write, by even an unskilled laborer, adds one-fourth to his value as a member of the community. This claim, if true, must be capable of demonstration through the observations of intelligent persons.

The following inquiries will be sent to employers or superintendents, to workmen, and to those observers who, as far as may be, are not embraced in either the first or second class. It is the desire of the Commissioner to combine the testimony from these three sources. You will confer a favor by returning to this office such answers to these questions as you are able to give from experience and observation, adding, also, such other information as may seem to you pertinent to the subject.

Very respectfully, your obedient servant,

JOHN EATON, JR.,
Commissioner.

QUESTIONS TO EMPLOYERS.

1. Have you employed a number of persons as laborers; what town; State; character of the labor?
2. Have you observed a difference in skill, aptitude, or amount of work executed by persons you have employed, arising from a difference in their education, and independent of their natural abilities?
3. Do those who can read and write, and who merely possess these rudiments of an education, other things being equal, show any greater skill and fidelity as laborers, skilled or unskilled, or as artisans, than do those who are not able to read and write; and, if so, how would such additional skill, &c., tend to increase the productiveness of their services, and consequently their wages?

4. What increase of ability would a still higher degree of education, a knowledge of the arts and sciences that underlie his occupation, such as a good practical knowledge of arithmetic, book-keeping, algebra, drawing, &c., give the laborer in the power of producing wealth, and how much would it increase his wages?

5. Does this and still further acquisitions of knowledge increase the capacity of the workingman to meet the exigency of his labor by new methods, or in improvements in implements or machinery; and, if so, how much does this inventive skill add to his power of producing wealth?

6. Would you generally prefer, or not, a person who had been trained in the common-school for the ordinary uses for which labor might be employed over one who had not enjoyed that advantage?

7. Whom would you, as an employer, choose for positions of trust, such as foremen or superintendents, persons unable to read and write, or those having the rudiments of education, or those possessing a superior education, all other things, such as skill, strength, and fidelity, being equal?

8. What do you regard the effect of mental culture upon the mental and social habits of persons who have been in your employ? Do they, as a class, live in better houses, or with better surroundings? Are they more or less idle and dissipated than the untaught classes? How will they compare for character, for economy, morality, and social influence among their fellows?

EMPLOYERS REPLYING.

Bartlett, Homer, treasurer Massachusetts Cotton-Mills, Boston, Massachusetts.

Bidwell, Hon. John, Chico, California.

Billings, W. W., woolen-manufacturer, Windsor, Connecticut.

Chaffin, Alfred, shoe-manufacturer, Holden, Massachusetts.

Fields, A., & Sons, nails, tacks, and brads, Taunton, Massachusetts.

Harris, C. M., woolen-manufacturer, Oakdale, West Boylston, Massachusetts.

Hill, George T., agent Thorndike (cotton-goods) Company, Palmer, Massachusetts.

Holbrook, E. W., cotton-goods, West Boylston, Massachusetts.

Perry, Josiah, woolen-manufacturer, Webster, Massachusetts.

Rand, George C., printer, (Rand & Avery,) Boston, Massachusetts.

Rathburn, O. J., cotton-goods, Woonsocket, Rhode Island.

Sibley, S. H., woolen-manufacturer, Warren, Massachusetts.

Shaw, E., woolen-manufacturer, Wales, Massachusetts.

Stephenson, John, & Co., car-builders, New York.

Towne, J. A., (Hale & Co.) piano-forte legs, North Dana, Massachusetts.

Ware, A. P., clothing manufacturer, Worcester, Massachusetts.

ANSWERS.

BARTLETT, HOMER.

1. I have. Lowell, Massachusetts. Manufacturer of cotton-goods.

3. Our American operatives are all able to read and write, while those who are unable to do so are usually Irish or French, (Canadians.) The former class is naturally more actively intelligent than the latter, independent of education. I have not been able to compare educated and uneducated Americans.

4. A high degree of intellectual culture could be of no particular advantage to the operators in our cotton-mills. The services demanded are manual, and but slight mental exertion is required. As applied to artisans, (mechanics,) a knowledge of the arts and sciences that underlie their occupations must tend to increase their effectiveness as workmen, and therefore tend to increase their wages, but to what extent I couldn't say.

5. The possession of such knowledge most certainly does increase the capacity of the workman to meet the exigencies of his labor by new methods, but to what extent no one can tell.

6. The first-named always.

7. The last-named.

8. Everything is in favor of the educated and intelligent. But you will remember that with us the uneducated are foreigners.

BIDWELL, JOHN.

1. I have. Chico, California. Many kinds, but principally farmhands, gardeners, teamsters, carpenters, blacksmiths, masons, and plasterers, clerks, book-keepers, shepherds, cattle, hog, and horse herders, from nearly all countries, including China.

2. There is, I think, such difference, but it will be difficult to measure it, to arrive at a correct conclusion as to what the present intelligent laborer would have been without education, and *vice versa*. There is no doubt that the difference would be great.

3. They do. Such additional skill and efficiency would increase productiveness, and consequently the value of services and wages, in my judgment, from 25 to 50 per cent. This is, however, simply an estimate, and in numerous cases would be too wide of the mark to be of any value, so much depending on the cultivation of fixed habits of industry and the proper training of the moral character, as parts of education. This is also supposing that the man would rise no higher than to work for wages. The ability to read and write, in a large proportion of cases, transforms a man from an employé to an employer. More education takes him from the labor of hands to that of mind, and wealth and position follow.

4. His ability and wages would be more than doubled.

5. It does. It adds to his ability to produce wealth at least five times, or 500 per cent. The man who can improvise methods or machinery to abridge labor will have a vast advantage over a shiftless man.

6. I would, most certainly.

7. The last-named class, most decidedly.

8. They have more regard for themselves and others; they live better, possess more self-respect, are less idle and dissipated, are more economical, and seem to have more hope of, or hold on, life. In a word, they have better character, are more patriotic, and make better citizens.

BILLINGS, W. W.

1. I have. Windsor, Connecticut. Men, women, and youth of both sexes, as overseers, weavers, spinners, and common-laborers. Usually have about ninety persons employed.

2. Not marked, but ignorant persons rarely excel, or become overseers.

3. Yes; persons that cannot read and write do not appear so anxious to excel, or to fit themselves for better positions by becoming qualified to fill them. Can't say as to what percentage, but some.

4. It would tend to make them study to improve, so as to take higher positions; but for our regular laborers, weavers, spinners, &c., while continuing in that capacity, they probably would not earn much more. There is a deficiency of skilled labor, such as loom-fixers, overseers, &c., that have to be taken from the best weavers, and better education would make more of this class.

5. Should say that it does, and would largely add to his power of producing wealth. Such men are always in demand at increased pay.

6. Yes.

7. Superior education.

8. As far as my information goes, should say yes to first and second questions. The third and fourth are hard to answer, as so many other considerations enter into these social questions; but, on the whole, would be glad to see a higher state of education among our laboring population throughout our whole country.

CHAFFIN, ALFRED.

1. Yes. Holden, Massachusetts. In the manufacture of woolen-goods.

2. I have observed quite a marked difference in favor of the educated.

3. I think they do. They are much quicker to take hold and understand the working of different machines. I think an increase of from 5 to 25 per cent. With the individual who can read and write, even if it be very poorly done, I never have any misunderstanding in regard to wages or in settlements; while those who can neither read nor write are

always on the alert, suspicious that they are going to be cheated, seldom or never satisfied.

4. Such men would soon become competent to take charge of rooms, as overseers, and in due time become agents, &c., consequently carrying with them the wages such skill is worth.

5. I think it does, very much.

6. I should. I have made it a point for several years past to employ only those who can read and write. I get along much better.

7. The educated man.

8. My ideas are expressed above.

FIELDS, A., & SONS.

1. We have. Taunton, Massachusetts. We manufacture tacks, brads, and shoe-nails.

2. We have.

3. They do. Intelligence is to be preferred, infinitely.

4. We hardly feel qualified to say in what ratio.

5. It does.

6. Common-school education always preferred.

7. Preceding answer applies to this question.

8. The higher the standard which our public schools attain, the better, mentally, physically, and socially, do our citizens become.

HARRIS, C. M.

1. Yes. West Boylston, Massachusetts. Such as is usually performed in the regular course of woolen-manufacturing.

2. I have not.

3. I find or observe little or no difference as regards skill, ability, and willingness to work. There is, however, among uneducated workmen a fondness for what is termed "fooling," and wasting time in scuffling and nonsense, which is not seen to nearly so great an extent among those who have had schooling. Also, when pay-day comes it is more pleasure to settle with those who can keep their own accounts, for with those who cannot there is always a suspicion and fear of being cheated.

4. I suppose it would give the laborer a different position in the world entirely, and he would no longer perform the *same* labor. But for ordinary manual labor, such as any bright, intelligent person can do, whether educated or not, the above-mentioned knowledge would have very little effect on the wages of a person engaged in it.

5. Probably. Perhaps 20 per cent.

6. I should prefer persons trained in common-schools, principally because they are more orderly, and many minor reasons. But none of these is of sufficient importance to make a difference in what I could afford to pay for their services.

7. Those possessing a superior education, of course; provided the cost is the same to me.

8. I think education improves the laborer in all these respects.

HILL, GEORGE T.

1. Yes. Palmer, Massachusetts. For running cotton-mills. Men, women, and children.

2. The difference in education of hands in a cotton-mill is so slight that I can give no opinion upon this point from actual observation.

3. Reading and writing have nothing to do in qualifying ordinary hands for doing our work. Some of our best spinners and weavers cannot read or write, having been brought up in Canada or Ireland. If these questions are to be applied to a people who have had the opportunity of obtaining school-knowledge, I should answer thus: "Give me those for work-people who have improved their early opportunities, and let the careless and dolts go."

4. Those persons who work in a cotton-mill, attending the machinery in carding, spinning, warping, and weaving, would not remain long in their respective employments if they had a good practical knowledge of the branches of learning mentioned in the above question. The American girls, with such education, shun our labor, and the young men prefer other occupations.

5. This question, as applied to our mechanics and overseers, is one which I should answer thus: "With the knowledge and acquirements involved in the question, the workingman is in a fair way of being much more useful and of adding largely to the power of producing wealth."

6. I should prefer the intelligent employé.

7. Those persons possessing superior education, that is, relatively. In other words, I should not prefer a highly-educated person for employment in a sphere of labor below his conscious capacity for superior work.

8. I am not prepared to answer these questions to my own satisfaction. The difference is so little between my best-educated help and those who read and write but very little, that a comparison between them would be more fanciful than real.

HOLBROOK, E. W.

1. Yes. West Boylston, Massachusetts. In manufacture of very light cotton-sheetings.

2. Yes.

3. There is some difference. Those who can read and write are better qualified to take charge of different rooms; while those who cannot read and write would be unfit for the place. Would increase the wages about one-third.

6. I should prefer one with a common-school education.

7. Persons possessing a superior education do not, as a general thing, work in or around a cotton or woolen mill.

8. They wish to live in better tenements; do not love to work any better than untaught persons; character better; not so economical; morality better; social influence stronger.

PERRY, JOSIAH.

1. I have. Dudley, Massachusetts. Manufacture of woolen-goods.

2. I have.

3. I think they show greater skill, but not, as a class, any greater fidelity, than those who are not able to read and write. I am unable to say what proportion of increase in productiveness the ability to read and write makes, having never given the subject any particular attention.

4. The higher the degree of education a man has, the less he is willing to work in the capacity I employ hands. Every man that has education to any degree above reading and writing, and consequent skill, wants to be an overseer and guide those who know less. We cannot have all overseers.

5. If he have sufficient inventive skill to be practical, it is good; but if he have only enough to make him desire and try to make some other power do his work, he is apt to neglect my work, and get no advantage to himself. I do not think education, unless he has inventive genius, would be any help in this particular.

6. I should. Aside from superior skill, they are more reasonable.

7. Those possessing an education. I care not how much they have, if it does not elevate them above their work.

8. Those having education are superior socially to those that have none.

RAND, GEORGE C.

1. Yes. Boston, Massachusetts. Printing.

2. These depend more on natural abilities than on education. Yet education, up to a certain point, is essential to a printer, whatever it may be for a hatter.

3. As I never saw a printer who could not read or write, I am not a good judge.

4. Such a man would never be a practical printer, nor would his higher degree of education add anything to his wealth-producing power.

5. "New methods," or "improvements in implements or machinery," depend on common and acquired sense in our business, and not on arithmetic or geology.

6. Yes; even to dig post-holes.

7. Do not see any effect of mental culture. Persons having the "rudiments of education." Never the first, and only when we could not get the second would we employ the third, because they are seldom printers, and, when such, must be master-printers right away; and then where should we get the laboring men?

8. There is not much "mental culture" (elaborate and extensive) that finds its way into printing-offices. Horace Greeley was a practical printer, but I doubt if he had any "mental culture." Orange Judd had mental culture, but he was not a printer. Printers are not made of "mentally-cultured boys." "Mental culture" raises the individual to be a master, and to want to be a man of position, to run big enterprises, live in nice houses, and otherwise be a nice member of society, and, as such, the society in which he moves determines much as to his character, &c.

RATHBURN, O. J.

1. I have. Woonsocket, Rhode Island. In the manufacture of fine shirtings.

2. I do.

3. The mere qualification of being able to read and write to a limited extent would not tend to elevate their skill; but I do consider educated laborers as more skillful in every department of my mills. Those possessing the qualifications of reading and writing, and having an inclination to study, usually aim at a higher standard than their present employment. So far as my experience goes, I think the heads of families are too eager to gain their living from the labor of the children, and the children are kept to work in the mills, and, by their close attendance, rather blunt their desires to attain a common-school education.

4. I think it would be difficult to give. In my estimation, the increase would be very large, as in most manufactories where they have a fair knowledge of arithmetic and can write a legible hand, a large proportion aspire to positions of overseers, superintendents, &c.; and, in order to fill those positions, it is necessary they should have a knowledge of arithmetic, &c.; and by having an education such as these classes would require, his attention, if of a mechanical turn, would lead him to improve the mechanical department of his work.

5. To answer this clause, it would be difficult to say how much his education might increase his power of producing wealth; but in a manufacturing district like ours, we know many are constantly at work desiring and striving to improve the various machines in their departments; and the higher education the person has, the more valuable would be his improvements, generally speaking.

6. I should.

7. I certainly should prefer the educated person.

8. They are generally better workers; in their social habits they are particular about their dress, houses, and living, and less likely to be idle and dissolute in their habits. You will not find that economy or morality among the untaught. Necessarily the better the class of labor, the better houses and surroundings are given them from choice. I wish I was able to give this question a strong answer, as it shows the great necessity of our laboring-class having a fair education.

SIBLEY, S. H.

1. Yes. Warren, Massachusetts. On woolen-goods, and as farm-hands and domestics.

2. Yes; the better educated are the more profitable to employ.

3. Those who can read and write do show more skill than those who cannot. Those who are educated in the rudiments are worth 25 per cent. more than those who are not.

4. I never had an educated man or woman in my employ who was not worth to me in any employment more than one who was not educated. The more they know the better they work. I should say the wages would be increased from 25 to 50 per cent.

5. Yes.

6. Yes.

7. The want of an education deprives many from positions of trust who have natural abilities for those positions, and I should not employ uneducated persons for places of trust, or even for foremen. I am more troubled to get educated labor than any other class. Education softens and refines, while ignorance debases and brutalizes, the men.

8. They are less idle. Generally better, though with some exceptions.

SHAW, E.

1. Yes. Wales, Massachusetts. Woolen-manufacturers.

2. We think natural abilities and disposition have most to do with the matter.

3. It depends upon where he is placed and whether he is honest or not. We have some good workmen who cannot read or write, but most of our help can, and consequently most of our good workmen read and write. The greatest trouble we have with our help is, that they study to do as little labor as possible. Such skill, rightly used, might increase services one-third to one-half.

4. Don't think we could operate our mills with such a class of help, as we could not run it by algebra.

5. It ought to, but our experience teaches us that our new methods, improvements, &c., are wrought out mostly by those of a common-school education, while the more learned are endeavoring to fit themselves for Congress.

6. Usually.

7. Couldn't say; we never employed a highly-educated person, or one unable to read and write. Couldn't say what the difference would be.

8. Effect is good. Live in better houses. Less idle than the untaught classes. Will compare favorably as to influence, but as to character, economy, and morality they are pretty well mixed.

STEPHENSON, JOHN, & Co.

1. Yes. For forty years. City of New York, New York. Some un-

skilled, but have chiefly employed such as smiths and iron-workers, workers in wood, machinists, painters, coach-trimmers, draughtsmen, artists, &c.

2. Yes; marked difference, both in amount and quality.

3. We have no data. Such condition of culture we esteem too low for our use, and have for many years rejected the lowest grade for either unskilled labor or as apprentices.

4. We consider that a person possessing the "higher degree of education" would be worth fully twice as much during the working-years of his life as one who had acquired the "rudiments of education" only.

5. "Knowledge is power." Our experience is, that increase of intelligence increases a workingman's power for productiveness. Education may more than double the capability of a people.

6. Yes; would positively prefer the school-training.

7. We have never found an uneducated person whom we would place as foreman, even over unskilled laborers. We have often had in our employ persons of integrity and much natural aptitude, who would have answered our purpose well in higher positions, and greatly to their advantage, but promotion has been prevented by lack of education. We would choose the educated expert.

8. Mental culture not only increases executive ability, but refines the sensibilities, and induces a better condition of social habits and home-comforts. Such live in better houses, with wives and children better cared for. The value of time is better appreciated, and economy in expenditures more thoughtfully regarded. We think the true policy of the United States is to educate her people and thus increase the producing capability of her workmen. This will enlarge the man's earnings and provide for superior social comforts, while at the same time securing the markets of the world for our productions.

TOWNE, J. A.

1. Yes. Dana, Massachusetts. Manufacture of piano-forte legs.

2. Yes.

3. They do; I should say some 15 or 20 per cent.

5. I should think it would.

6. Most certainly.

7. Should choose for positions of trust, such as foremen or superintendents, persons with a good, fair education.

8. Think it is of great advantage to themselves and others. They, as a class, live in better houses and with better surroundings, and are less idle and dissipated than the untaught classes. That is what has come under my observation.

WARE, A. P.

1. I have. Worcester, Massachusetts. Custom and ready-made clothing.

2. Have no doubt that education tends to improvement in skill and perfection of workmanship.

3. Think I have. I have rarely employed persons unable to read. Skill and excellence of workmanship enable those employed upon ready-made clothing to pass on to custom clothing, in which the earnings are from 25 to 50 per cent. greater, and in which the scarcity of good workmen and work-women is usually far the greatest.

4. Not certain that increase or superiority of products in my business would result, and think increase of wages likely to be contingent thereupon. Probably in most such cases the persons would seek other positions of employment.

5. Same answer as above.

6. Certainly would prefer the one trained in the common-school.

7. In my business would prefer a person of fair education. A person of quite superior education would most likely aspire to some other employment.

8. Believe the tendency of culture to be elevating to personal and social habits, and that the homes and surroundings of cultivated persons are apt to be in favorable contrast to those of the ignorant. Am of the opinion that a corresponding answer to the other questions would be correct.

QUESTIONS TO WORKINGMEN.

1. Have you, as a workingman, observed a difference in the skill, aptitude, or amount of work executed by persons, arising from a difference in their education, and independent of their natural abilities?

2. Where were your observations made; State; in what occupation were the laborers engaged?

3. Do those who can read and write, and who merely possess these rudiments of education, other things being equal, show any greater skill and fidelity as laborers, skilled or unskilled, or as artisans, than do those who are not able to read and write? And, if so, how much would such additional skill tend to increase the productiveness of their services, and consequently their wages?

4. What increase of ability would a still higher degree of education, a knowledge of the arts and sciences that underlie his occupation, such as a good practical knowledge of arithmetic, book-keeping, algebra, drawing, &c., give the laborer in the power of producing wealth, and how much would it increase his wages?

5. Does this and still further acquisitions of knowledge increase the capacity of the workingman to meet the exigency of his labor by new methods, or in improvements in implements or machinery; and, if so, how much does this inventive skill add to the power of producing wealth?

6. Would a person who had been trained in the common-school be generally preferred for the ordinary uses for which labor might be employed, over one who had not enjoyed that advantage?

7. From observations you have made, whom do you consider best fitted for positions of trust, such as foremen or superintendents, persons unable to read and write, or those having the rudiments of education, or those possessing a superior education, all other things, such as skill, strength, and fidelity, being equal?

8. What do you regard the effect of mental culture upon the personal and social habits of persons who have been in your employ? Do they, as a class, live in better houses, or with better surroundings? Are they more or less idle and dissipated than the untaught classes? How will they compare for character, for economy, morality, and social influence among their fellows?

WORKINGMEN'S ANSWERS.

Adams, M., Cleveland, Ohio.

Andrews, Israel W., Danvers, Massachusetts.

Armstrong, R. S., Peekskill, New York.

Blanchard, Frank, Cincinnati, Ohio.

Bonnissill, Thomas S., Lockport, New York.

Bradford, R. P., Cincinnati, Ohio.

Brown, John H., Jackson, Michigan.

Cobley, E. B., Boxborough, Massachusetts.

Howell, B. F., Glass-Works, Covington, Pennsylvania.

Cooper, John G., Albany, New York.

Crews, T., Murphysborough, Illinois.

Davie, Curtis, Plymouth, Massachusetts.

Delancy, W. D., San Francisco, California.

Darley, ———, South Saint Louis-Iron Works.

Donohue, John O., Rochester, New York.

Eshleman, U. P., Poughkeepsie, New York.

Foy, Owen, Indianapolis, Indiana.

Genin, John N., New York City.

Hodgkins, Robert, Detroit, Michigan.

Hill, Amos, Stoneham, Massachusetts.

James, W. H., Portsmouth, Ohio.

Johnson, Albert E., Haverhill, Massachusetts.

Jones, Mrs. Frances R., secretary of Daughters of St. Crispin, (trades-union,) Stoneham, Massachusetts.

Joy, L. S., Auburn, New York.

Davis, E. M.,

Lucker, C. H.,

Donelan, M.,

} Committee of Labor Assembly of Cincinnati and
vicinity.

Lane, Emma A., Washington street, Boston, Massachusetts.

Parr, John, Albany, New York.
 Pearson, Chas. W., Charlestown, Massachusetts.
 Peters, E. T., Washington, District of Columbia.
 Sanford, Amos, Columbus, Kansas.
 Sanborn, A. R., Lawrence, Massachusetts.
 Soute, Marcus, Middleborough, Massachusetts.
 Solomon, Phineas, President Cigar Makers' Co-operative Association, Westfield, Massachusetts.
 Wheeler, Oren S., Milford, Massachusetts.

ANSWERS.

ADAMS, M.

1. I have observed that workingmen who are educated are more expert in their way of working, while the uneducated drag out their time in their old way of working.

2. Cleveland, Ohio. In shoemaking, in coopering, and in many other trades.

3. I find that those who merely read and write are better men and more trustworthy; and, with additional skill, the laborer will become more dignified, and would so enlighten his mind as to direct muscle or machinery. His labor would be more productive. The workingmen who can read and write will raise themselves to that respectable position in society to which they as free citizens are entitled to, and would increase their productiveness 25 or 30 per cent.; while the ignorant crouch beneath the lash of unprincipled capitalists, and allow themselves to be handled and driven as serfs.

4. A knowledge of the arts and sciences that underlie his occupation will give the laborer the power of becoming more and more perfect in his trade or whatever business he may be employed in, and would increase his wages from 30 to 40 per cent.

5. Knowledge is the great productive power in man; it elevates and dignifies all who possess it; in the great field of human industry it brings to his mind the necessity of improvement in implements or machinery; to lighten the burdens of the laborer by shortening the hours of labor, so that workingmen could have more time to read, write, and cultivate their mind, would add greatly in producing wealth.

6. An honest employer will prefer one who has been trained in the common-school rather than one who has not enjoyed that advantage.

7. As a general rule among employers, when they choose a foreman or a superintendent, it is one that possesses the necessary qualifications; that is, a superior education.

8. This inquiry is most important—the difference among the laboring classes. Ignorance shows itself wherever you may go, and more so in this city (Cleveland.) You can see many pleasant little cottages or houses, with beautiful grounds; you will find in them workingmen who possess some education. You will also find a miserable lot of shanties, with all the

marks of poverty, drunkenness, crime, and misery. You may go there and ask them to sign a paper; their signature is a mark.

ANDREWS, ISRAEL W.

1. I have. The educated, if not manually more industrious, are more skillful and apt, more prudent of strength in their labor, and more systematic.

2. Danvers, Massachusetts. Mostly mechanical, shoemaking; agriculturally, gardening and farming.

3. I consider, from my own observation, that, everything else being equal, those who labor are more reliable and skilled in proportion to their knowledge. I am acquainted with but few who do not know how to read and write, and they are never the best help.

4. Mind cultivated is, when practically informed and disciplined, so much addition to mere brute force; that is to say, the educated force of man is superior in proportion as it is educated. For some employments under the supervision of others, and where it requires but little, if any, skill, the ability to labor being limited by physical endurance, there is not in any degree the same difference as where the faculties of the mind are required. When judgment and mental perception are united, there is the perceptible superiority, and all art and science are ready servants and helps to society and the laborer.

5. To answer these questions, perhaps, will be but repetition. The American, more than any other, is most equally if not profoundly educated. He has sought out many inventions in implements, machinery, &c. No exigency arises that he does not meet, and from the ranks of the workingman comes all the power of producing material wealth. If man were horse-power, I could better estimate the increased gain. If two grains of knowledge add one per cent., four would add more than two per cent. to the actual power.

6. Most certainly, by any intelligent employer; but by an ignorant person an ignoramus would as likely be preferred, being more likely to suit for his cringing subserviency than an educated employé.

7. If the employer was in any way himself educated, he would; he could not do otherwise than employ the best educated. But there are some who do not know the difference, and hence are as likely to choose the one as the other. My observation has led to this conclusion, that our system of society leads to the engagement of the most ignorant of our people for the business portion.

8. My opinion is that mental culture is an improvement, or improves the personal, social, and moral habits of workingmen. I think they live better, with better accompaniments, and are more industrious and virtuous than the ignorant. Is not the last question answered? Human power, after deducting its brute force, is increased just in proportion as it becomes educated.

ARMSTRONG, R. S.

1. No, I have not. The mechanics working at my trade are not more skilled if educated.
2. Peekskill, Cortland County, New York. In molding.
3. Not any. It depends on the muscle.
4. Not any.
6. Certainly. He is more ready to reason.
7. It depends on his executive ability and driving-power.
8. Mental culture makes them better citizens, fits them for the duties of life, makes them the equal and peer of any.

BLANCHARD, FRANK.

1. I have, and the difference is in favor of education.
2. Cincinnati, Ohio, and Louisville, Kentucky. Machine shoemaking.
3. Yes. I should think about 20 per cent.
5. It does. The second question I cannot answer.
6. In all cases.
7. He would, if he studied his interest, choose those who have the best education.
8. I regard it as a blessing. They do. They are not. You may take a man that is educated, and you will find that he has far more influence with his fellow-workmen than one not educated.

BONNSILL, THOMAS S.

1. I have; particularly so in mechanical employments.
2. In England, and Lockport, New York. The various branches engaged in the erection of buildings.
3. As a rule, they certainly do in employments generally; and especially so in labor requiring more than usual skill; but for a man to carry the hod, I would prefer one who can neither read nor write. A man of some trifling scholastic education might be expected to make better mortar than one totally uneducated, and would, in proportion to his knowledge of the principles of cements, command higher wages.
4. Unfortunately, opportunities for observation on the subject here proposed have been very limited, yet experience has taught me that if I entered a first-class building to find a carpenter who could best solve some mathematical problem, the one erecting the stair-case would be sought; if to find one who could neither read nor write, the man kept at the jack-plane would be sought; the wages of the former would double that of the latter.
5. Is not inventive genius a distinct and inborn faculty? The ax, when forged and tempered, has in it the steel, but is unfit for use until ground and sharpened. Just so the latent talent of the mind may scarcely be discovered until education has worn off the dross and iron, exposing and sharpening the more valuable qualities. How much of

inventive genius is lost for lack of education in early youth who can estimate ?

6. For all labor where skill is requisite, the advantages are marked and positive. The ill-paid drudge is spoiled by education.

7. The man of superior education (other things being equal) would be selected by the employer, and be more acceptable to the employed. An uneducated foreman seldom commands respect.

8. Mental culture, giving higher tone to the mind, produces an aspiration for kindred society and more of the comforts and conveniences of life. The educated man is usually more industrious and faithful than the uneducated ; and where a scriptural education has been duly interwoven with the mental training or culture, high and noble aims are manifested, giving to society a man of better moral and social standing, a kinder neighbor, and a better friend.

BRADFORD, R. P.

1. I have, and can safely say there is a decided difference in favor of education.

2. Principally in Memphis, Tennessee, and Cincinnati, Ohio; machinists, blacksmiths, pattern-making, molding, and ordinary laborers in founderies and machine-shops.

3. I would say 25 per cent. is a very low estimate of the difference in the increase of productiveness of the educated. But I find that the uneducated are generally preferred where it is possible for such to fill the situation, because they are of a more servile nature, and, having learned one branch, never try to advance, but will stay at that for a lifetime, taking such wages as the "boss" gives them, as they cannot do any better for want of education.

4. That is just the equalizer, for if all had that qualification there would be a very few very poor and a very few very rich ; for while the uneducated would increase in wealth in proportion as they increase in knowledge, the rich would decrease in wealth to a certain extent, for a large share of their riches is wrung from the uneducated poor ; so the increase would not be so great, but more uniform.

5. It does increase just in proportion to the education he receives, but as to the amount, it is difficult for me to say. But out of fourteen apprentices in the shop where I served my time, four were about equal in all respects, except education ; to-day two are receiving one thousand dollars a year, while two are receiving three thousand—the latter being the better educated.

6. Yes ; for all ordinary uses he would undoubtedly be preferred.

7. If the employer would study his own interest he would employ the one having the best education, but at the same time keep a strict watch over his actions ; for if there are others in his charge having a good education, he will find some way of getting rid of them, as the uneducated are easier to keep under, and there is no danger of their getting his place.

8. As a class, they live in better houses ; better surroundings ; neater and cleaner in every respect ; they are not as idle nor as dissipated as the untaught class ; for character, economy, morality, and social influence they stand far ahead of the uneducated.

BROWN, JOHN H.

1. I have. I do know that men, as mechanics, require to have more than the mere ability to read and write. It is necessary to understand various rules that require a knowledge of figures. The more educated, the better a mechanic can generally get along in executing his work.

2. Cleveland, Ohio, in Jackson, Michigan, and formerly in Salem, Massachusetts ; in various kinds of business. I think that education has a general tendency to improve both skilled and unskilled laborers, and has a tendency to elevate them in the scale of their being.

3. I think that such persons as spoken of in the former would be preferable to the latter. I think it would tend to increase the productiveness of their services at least 20 per cent. I have often noticed that the degraded portions of a community are poorly educated or not at all ; also that the dissipated and the felons are generally so ; therefore education is very essential to reform.

4. I do not know that I can answer this question directly ; I think that would be governed by circumstances. I think that, generally speaking, they would command more wages, and there is no doubt that a person highly educated generally does command more respect, and also has more influence in society, than one that is not.

5. It does to a very great extent ; that can be seen by the amount of labor performed in a short space of time by the improvements in a thousand ways. As to the increase of wealth or the proportion of increase, I am not able to estimate, but it is very large, and as education increases it must continue to increase.

6. I think that this would not be the case in and under all circumstances, but then there would be a preference generally for the former.

7. The person that is skilled and educated, of course. I believe that education is the greatest safeguard to our form of government. Unless the people are kept up to a good standard of education, this republic will not continue as was intended by the founders.

8. To the first question, I say it has a tendency to elevate ; to the second, they generally do ; to the third, I should say not ; and, lastly, I should say, with all the combined qualities the influence would be good. It could not be otherwise, generally speaking ; that is to say, if they are applied as they should be. People are apt to abuse many favors and advantages.

COBLEY, E. B.

1. I have observed that education among workingmen makes them more skillful.

2. Charleston, South Carolina ; manufacturing shoes.

3. As far as my observations have extended among laborers, those who can read and write, or merely possess the rudiments, show more skill than those who are not able to read and write, which increases their wages 10 to 20 per cent.

4. A higher degree of education, a good practical knowledge of arithmetic, book-keeping, algebra, and drawing, would increase wages 25 to 50 per cent.

5. This and still further acquisitions of knowledge would increase the power of producing wealth 25 per cent. or more.

6. In all cases I can say persons trained in common-schools would be preferred.

7. Employers generally choose for foremen or superintendents, persons possessing a superior education, skill, and fidelity.

8. I think, to contribute to the progress of workmen for mental culture and social habits, there is a vital necessity of education, so that knowledge and labor might be joined ; then, as a class, workmen would live in better houses, with better surroundings ; character better ; not so much dissipation ; this will lead to economy, and good morals will follow.

HOWELL, B. F.

1. I have many times observed a difference in the skill and aptitude of workmen in performing different kinds of work.

2. At glass-factory at Covington, Pennsylvania ; glass-blowing, flattening, pot-making, carpenter-work, and all kinds of work connected with the manufacturing of glass.

3. Those who can read and write, and are not further advanced in education, show more skill in work than those who cannot read or write. I find less trouble with them, can make them understand better, and they will do their work in a more workmanlike manner. The product of their labor is worth about one-sixth more, and their wages should increase in proportion.

4. A higher degree of education, with the practical knowledge of the arts and sciences, would enhance the power of producing wealth one half, and wages should increase in a certain ratio.

5. The more practical knowledge a man has the more he strives to improve in implements and machinery, in order to make his labor by hand less. It adds very much to the power of producing wealth.

6. I would prefer to employ a person with a common-school education over one who does not enjoy that advantage.

7. A successful man would employ in a position of trust one with superior education, all other things being equal.

8. The effect of mental culture upon the personal and social habits of workmen, I regard as very beneficial. It makes them more cheerful, contented, and enterprising. They live better and the surroundings are

all better; less liable to dissipation and vice, are more economical, have a moral and social influence over others.

COOPER, JOHN G.

1. My experience is that the educated mechanic excels.
2. Albany, New York. Manufacturing tin-work, sheet-iron work, galvanized-iron cornices, tin and slate roofing, and plumbing.
3. The man who can read and write is generally preferable to one who cannot. It is easier to convey to them your meaning, and if you cannot be with them you can write your instructions, so that they can understand what you want without your continued presence and oversight, which is a thing very much to be desired, and consequently makes them more valuable.
4. It would increase his power of production in the same ratio as he might excel in these branches; his wages would be increased perhaps 10 per cent., but he would gain more by the demand for his services, which, in nine cases out of ten, would insure his steady employment.
5. The thoroughly-educated mechanic generally is striving to find new methods to economize time, and is the best calculated to invent, and, consequently, is the most desirable employé.
6. Yes.
7. Those having the advantage of education would be preferred, even though they might be somewhat deficient in strength and skill to perform; their ability to lay out and plan work, because of being educated, making them the most desirable.
8. They generally live in a better class of houses; are generally cleaner in their persons; are not as a class as given to idleness and dissipation, and excel in the moral and social qualities that go to make up good society.

CREWS, T.

1. have, as a workingman, been a close observer for three years and a half, and believe that a common-school education will add one-fourth.
2. Murphysborough, Illinois; Jackson, Connecticut. Farm-laborers, mine-laborers, and carpenters.
3. Those who can read and write do show greater skill and fidelity, and will add 15 to 20 per cent.
4. In answer to this, I think it would add 10 per cent.
5. The further advancement of knowledge will give more power, and will add from 8 to 10 per cent.
6. The person trained in a common-school would be preferred.
7. An employer would choose the one of a superior education.
8. Mental culture upon the social habits of workingmen makes them better one-half; they live better, with better surroundings. They will compare favorably, and are superior, for economy and social influence.

DAVIE, CURTIS.

1. I have.
2. Boston and Dorchester, Massachusetts. Masonry.
3. To the first question, I answer, it is my observation that they do. The last question I shall not attempt an answer.
4. Would not attempt an answer.
5. The first question I answer in the affirmative. The last question unable to answer.
6. I would answer yes; at any rate I would so prefer.
7. Those having the superior education, unless favoritism was shown.
8. First question.—Answer. The effect beneficial. Second question.—Answer. They do. Third question.—Answer. They are not. Fourth question.—Answer. They compare favorably, all things being equal; they are leaders.

DELANCY, W. D.

1. I have observed a difference in favor of the educated.
2. As an agriculturist and ship-carpenter in New York; as a mechanic in California.
3. Those who read and write, I think, better understand their business or calling, however humble it may be, and have a better appreciation of their obligations to their employer; manifest more desire to excel, to do their work well; should receive an advance in wages of from 10 to 20 per cent.
4. Every human being should know how to read and write and have a fair knowledge of arithmetic. The manual laborer is not benefited (as a laborer) by too much schooling. The mechanic should understand algebra and drawing.
6. Yes.
7. Those possessing a superior education.
8. Mental culture has a tendency to refine, to elevate; creates a desire for more comfortable homes; makes the laborer desire to become a mechanic, and the mechanic something better. In proportion as our workmen become educated, their influence on society is felt.

DARLEY, ———, South Saint Louis Iron-Works.

1. Have frequently.
2. Saint Louis, and Ohio and Missouri. In the building of railroads and manufacture of iron.
3. As a general thing, I believe they do. The increase in wages would depend much on their occupation. In some places, where only force and aptness were required, nothing. In others, 20 per cent.
4. To this question I have not the time to answer.
6. He certainly would always gain a preference.
7. For the positions named, the higher the educational attainments the more valuable the man.

8. The effect of mental culture is to raise the ideas so that what were luxuries become necessities. They like better houses, better company, are less idle, and for economy, &c., set a better example, and also improve the untaught and uneducated by their surroundings.

DONOHUE, JOHN O.

1. Yes, I have.

2. Rochester, Buffalo, Chicago; also in the Canadas. In the foundry business, also in machine-shops, and also other branches of mechanism. The day-laborer—what I mean is a man employed in loading and unloading, or employment of that kind—I do not think education increases his ability, as all required is strength.

3. In the case of laborers, the educated man has not much advantage; but in the mechanic arts it affords him every advantage, and the more thorough the education, other things being equal, the more thorough the mechanic.

4. As to increasing his wages over the uneducated, it would in some cases, I might say in all, at least from one-quarter to one-half.

5. As to this I am unable to answer, but I will endeavor to illustrate, so that you may draw your own conclusions. For instance, a mechanic or laborer has an inventive mind; he gets up something new by way of machinery, but he has not a head for calculation; his machine is a good one, at least the idea is a good one, but there is something wanting; for instance, in a reaper and mower, it does not run fast enough; he requires the man of calculation, and so in ten thousand other cases.

6. I think they would.

7. Most assuredly the man of education.

8. One of the greatest benefits of education to the mechanic or the laborer, the mechanic especially, is, he becomes more temperate, more industrious, and a much better citizen. As an illustration, I know of a mechanic with a fair education and one without education; both started in the same shop to learn the trade of iron-molding; one had no education, the other but little; the former applied himself to getting an education at the night-school, and to-day he holds a good position in society, while the other is not worth a decent coat to his name.

ESHLEMAN, U. P.

1. Yes, sir, I have always.

2. Poughkeepsie, New York. Carpenter-work more particularly.

3. In our trade a man with education can go ahead with greater skill and rapidity, and accomplish work that an uneducated man cannot, and certainly can demand more wages, and get a much higher price for his work.

4. The higher a man is educated the better will his ability be to accomplish his work; as for algebra and drawing, it is very essential for

our craftsmen ; it gives them more confidence to take hold of difficult work, where a poorly-educated man dare not try.

5. Certainly it does ; it is the main secret of wealth ; the more speedily work can be accomplished the better for all classes of tradesmen.

6. To be sure, for the " boss " can place more confidence in him, to do his work in a workmanlike manner.

7. A man with good education can gain advantages, even if he be not quite so well skilled in work, for he can study out advantages.

8. It makes them look up to a higher standing. As a general thing they will try to live in good style. Idleness is the last thing thought of. You will, in most cases, see them using the utmost economy. Moral in every sense of the word, and generally kind and sociable.

OWEN, FOY.

1. My observations are that the better education a workman has the better workman he is, especially in my trade, which I have worked at twenty-four years.

2. In Ohio and Indiana mostly. Mostly as machinists, foundery-men, and iron-workers.

3. It is very seldom I have met a man in the iron trade that could not read or write, but the majority of them can do but little more ; hard labor and long hours leave the mind in no condition for cultivation. I have been an active member of workingmen's societies for several years, and my observations are taken from them also.

4. A knowledge of these sciences increases the workman's wages 25 to 50 per cent., and he is no longer classed as a workingman, for they drop the hammer and do the head-work.

5. I knew three young men in this place, inside of the past four years, that took instruction in drawing machinery, while working at their trade, and since then have taken out patents. One of them is now manufacturing an invention he patented, the American governor. I could enumerate numerous instances of the same kind that have come under my observation since working at my trade.

6. By the time a poor boy knows how to read, write, and cipher, he has to go to work or learn a trade.

7. The more knowledge and skill the better the foreman or superintendent would be. I have seen men made foremen who educated themselves for the position after the appointment, (they possessing the mechanical skill previously,) which additional knowledge made great improvement in them.

8. Mental culture has a decided influence on the habits of workingmen ; it makes them better workmen, more temperate and more economical ;

1 ; they live in better surroundings ; are more industrious, more patriotic, and better citizens.

GENIN, JOHN N.

1. Most certainly.

2. City of New York, New York. Hat-manufacturing.
3. They do, and I should say at least 33 per cent.
4. I should say an additional 25 per cent.
5. It certainly does, and I should say it doubles his capacity.
6. Most certainly.
7. Most certainly the one of a superior education.

8. 1. Elevating in every respect. 2. They do. 3. No. 4. Every way superior. N. B.—The above questions, as stated, seem to me so self-evident as to preclude the necessity of answering, but while abroad I have heard boss-mechanics argue against their employés having too much education, as they thought ignorance made them better satisfied to remain mere servile drudges, and I have heard sentiments similar in my own country, but, thank God, seldom.

HODGKINS, ROBERT.

1. As president of the Trades' Assembly, of Detroit, and of local trade organizations. I am satisfied that there is a marked difference.

2. In several places, especially in Detroit, Michigan. As carpenter, brick and stone masons, molders, machinists, harness-makers, shoe-makers, cigar-makers, and farmers.

3. A mechanic who can neither read nor write seldom rises above the common branches of any class of mechanics. It requires at least the common-school education of this country to fit a man or woman for foreman or overseer, or even to make good competent workmen. In many of the branches of mechanism, therefore, their wages generally rise with their skill and intelligence.

4. A good, practical knowledge of the arts and sciences you mention is of great benefit in inventing and working labor-saving machinery, and it is proved by experience that the increase of practical inventions increases the wages of the workman, for wages are 40 per cent. higher now than in 1855-'56.

5. Education makes a man or woman more observing, and creates an anxiety to excel, and every hour of useful labor adds to the wealth of the nation.

6. He certainly would in nearly every branch of business.

7. According to my observation, the educated man would be preferred.

8. A man whose mind is disciplined by an ordinary education will generally have a pride in making home attractive; therefore I consider his influence for good is far better than the untaught man.

HILL, AMOS.

1. I have observed a difference, and find the man of education to be better skilled, and more easily taught in his trade or calling, than the uneducated.

2. In various places. In shoemaking, and in various other trades.

3. My observation leads me to believe that even a small amount of education tends to increase his skill and fidelity. The percentage would vary much according to the individuals.

4. In many cases the laborer would be capable of producing double the amount of work, and consequently should receive double the amount of wages. In others the difference would be very slight.

5. The increase of knowledge increases the capacity of the workman to meet the exigency of his labor in very many ways; how much, depends upon the circumstances under which he is placed.

6. Yes.

7. If for true usefulness, those possessing a superior education.

8. Mental culture has a beneficial effect upon the personal and social habits of the workingman. He lives in a better house, with better surroundings, is more industrious, has better character, is more economical, and stands, morally and socially, better among his fellows.

JAMES, W. H.

1. A great majority of the men of common education, who have come under my observation, far excel the illiterate man in skill, &c., in whatever branch of labor or mechanical work they may be engaged. Some few men of even *good* education never make skillful mechanics, while the man who lacks education, or is altogether illiterate, climbs the topmost pinnacle from natural abilities alone; yet the man who possesses both education and natural abilities becomes the most skillful in the shortest time. Hence the necessity of education.

2. At Cincinnati and Portsmouth, Ohio. My greatest scope of observation has been made in my own trade, viz, shoemaking, both on the old system of hand-sewing, and the present system of machine-manufacturing.

3. It would seem as though the first question in No. 3 is answered in No. 1; yet there might be a great deal more said to enlighten the inquirer, but the space only allows an abridged answer. The man who can merely read and write is not much better off than he who cannot do either, as far as the help it would afford him in surmounting anything requiring mathematical calculation; but, at all events, he who does possess those rudiments has the advantage of him who does not possess them. Though he perhaps might not be as skillful as the other, he would always have the preference in any place of trust. To the next I would say at least 50 per centum.

4. The greater the education the greater the ability; but whether the above-mentioned sciences would increase the ability of the laborer or artisan in every avenue of life, is a matter of doubt to me. While in many branches of industry they are indispensable, in still a greater number they are not needed to increase the ability of the workingman; consequently the knowledge of these sciences to all men would result in the greater wealth-producing power of one class, while to the other it

would be of no use, as far as his avocation is concerned ; yet he who possesses them always strives for some position in which he can use them ; consequently the knowledge of them increases the ability, which results, sooner or later, in the power of producing wealth on his own account, or an increase of wages in some high places of trust.

5. To this question I will say that every acquisition of knowledge increases the capacity of the workingman, though without doubt ninety-nine per cent. of the real inventive genius has been displayed by the very illiterate, and only improved upon by the learned ; yet I do not say if the illiterate man had received education in his youth that his inventive genius would have left him, by no means, though he might have turned attention to some other sphere of life. Yet it shows that whatever talent a man may possess, it lies dormant until education comes to its relief. It is a hard matter to determine its power.

6. As a general thing the education of the applicant is not taken into consideration in ordinary pursuits, which, out of respect to our school-system, should be, in my opinion. To the question I will answer, "Yes."

7. Employers are generally very certain to be on the lookout for cheap men ; *i. e.*, men who will fill the offices in their gift a little less, financially, than the present incumbents, though they will at the same time try to be certain of their ability ; but it is not unfrequently the case that a first-class man who receives a moderate salary is discharged to give place to some one (of whose ability nothing is known) because he will work for a little less pay ; and often I have seen this mode of economizing absolutely fail ; so they have to fall back on the old hand with an advance on his salary. Now, each of those men might be well educated, but the cheap man is deficient in skill. I never knew a skillful man, one who is thoroughly competent in his profession, to try to obtain a situation by undermining another, whether educated or otherwise. I believe a thoroughly competent man must of necessity be educated. When employers are looking to their own interest they invariably choose the man who has at least a common-school education, even if they have to pay a higher salary. They never told a man yet that he was too highly educated.

8. There was a time when mental culture had not much effect on the morals of the workingmen. That was when the employer at his will could say, "You must work for so and so, or quit my shop." That was before they knew how to combine themselves for protection (in national societies) against the encroachments of villains who were filling coffers at their expense. That was when there was no sympathy between fellow-craftsmen. That was when they were serfs, slaves—"Do this or that, or go out-doors, you dog !" Every class of mechanics, yea, hod-carriers, have their societies for self-protection, and see to it that "Pat" does not work less than "Mike," and *vice versa*. Hence their present state of independence. There are exceptions, of course. But

this organization for self-protection has by degrees developed the mental culture which has been smoldering so long, and little by little it is becoming a mighty blaze. Day by day the moral effect of those organizations is being more deeply felt. Men who possess any degree of education are setting examples to the uneducated, who try to imitate as near as possible their leaders for their mutual and also individual benefit; consequently the personal and social habits of the workingmen are rapidly improving. To the next I answer, "They do." To the next I say, "No." To the last I say, "Of course there are exceptions; but the percentage of educated workingmen who will not compare very favorably is very small indeed."

JOHNSON, ALBERT E.

1. I have noticed that there is a marked difference between the educated and uneducated workmen.

2. In Haverhill, Massachusetts. In the manufacture of shoes, in the branch known as buttoning.

3. I think the man who can read and write shows greater skill, and is much quicker to learn the different parts. The difference in the wages of the two classes named is not great; perhaps 5 per cent. in favor of the man who reads and writes.

4. I think the difference here is greater. The man having the above qualifications, being a much better workman, doing the more difficult parts of work, increases his wages over the other class from 10 to 15 per cent.

5. It is a noticeable fact that the educated workman always (or with few exceptions) uses the improved tools, and always keeps them in better condition, thereby doing much better work, and will study to invent new tools. How much it would add to the power of producing wealth I am unable to say.

6. He would, in almost every case.

7. In my business it would not be absolutely necessary that the foreman should possess a superior education. But it would be a rare case where a manufacturer would employ a man as foreman who could not read and write.

8. There is a marked difference in the habits and living. The man without education being more dissipated, and careless, and idle. The educated man striving to improve his condition, and usually taking the lead in movements for the benefit of workingmen. Many of them become manufacturers. In this place I should say that at least one-third of the shoe-manufacturers were at one time shoemakers.

JONES, Mrs. FRANCES R.

1. Yes, often; for as the natural fruit is made better by grafting or cultivation, so are the natural abilities of the human race brought out, or, in other words, developed, by education; and so skill, aptitude, or

talent is made manifest by education ; while, like the apple, without the graft or cultivation, it would have remained the natural fruit forever.

2. In the work-shop and kitchen ; Stoneham and city of Salem, Massachusetts. Shoe-fitting, house-work, and other branches of labor.

3. Even these, in my opinion, increase skill ; of course there is a wide difference in different individuals, as some are endowed with more natural abilities than others. But allow the skilled machinist or artisan the benefit of books relating to his trade, would he not be likely to gain knowledge and increase his skill ? As to fidelity, it is a sort of propensity, but I think education governs it somewhat, although education will not entirely remodel nature. That it does increase the productiveness of their services, and of course wages, I do believe, but the amount I hardly feel competent to estimate.

4. I believe a knowledge of book-keeping, arithmetic, and natural philosophy the most important to the laborer, and that a thorough knowledge of those branches would increase the power of producing and wages fully one-half.

5. Most certainly do I believe it does. But how much this skill adds to the power of producing, depends, in my mind, upon how the one possessing this skill may be situated. I would need considerable study to estimate it.

6. I should naturally suppose the former would ordinarily be preferred. But a little thought suggests that it would depend somewhat on what branch of labor it might be.

7. Unless the employer be a rascal or a monomaniac, he would be likely to choose the latter. But it is too true that employers seek for pliable characters, those who give evidence of answering the policy of the firm, regardless of higher qualities.

8. Mental culture refines and elevates in every respect ; creates a desire for better surroundings, an aspiration for that which is good and noble ; tends to develop the naturally good in our natures, and lessen the bad, and so improves character and social influence.

JOY, L. S.

1. I have. In answering these different questions, I not only give my own views, but those of many manufacturers, with whom I have conversed upon the subject.

2. Auburn, and other places in New York. Both as tradesmen and common-laborers. The difference is manifest in all spheres of labor, but in skilled labor more than in others.

3. Those who cannot read or write may manifest as much fidelity to the interests of their employer as those who can, but, as to their being finished artisans, it is impossible ; for in order to become a skillful artisan it is necessary for a man to study different works of science,

which he cannot do if he can neither read nor write. The difference in the productiveness I am not fully prepared to give.

4. My opinion, in answer to this question, is, that as you increase a man's mental faculties, in just such proportion you increase his worth to the world and his employer, and his wages should be increased in the same proportion, if business men would conduct business upon true principles.

5. You will find, by investigation, that all improvement is the result of increased knowledge; but as to the increase in the power of producing wealth, I am not prepared to state; still, I have often thought the increase would be from one-fourth to one-half.

6. Most certainly so. Many of our manufacturers will not employ men who can neither read nor write, unless actually compelled by circumstances to do so.

7. Employers will not place in a position of trust a man who can neither read nor write, it makes no odds what his fidelity may be; for it is impossible, I care not what his skill, strength, or fidelity, if he can neither read nor write, for him to perform the duties pertaining to such a position.

8. They live in better houses, have better surroundings, are less addicted to dissipation and idleness. In conclusion, as you increase the culture of men's mental faculties, just in such proportion you increase their worth to their families and society in general.

DAVIS, E. M.,	} Committee of Labor Assembly of Cincinnati and vicinity.
TUCKER, C. H.,	
DONELAN, M.,	

1. We have. The difference is in favor of education.

2. Throughout the United States. All branches of industry.

3. They do. Twenty-five per cent., in our opinion, is a low estimate of the increase of productiveness; but no increase of wages for the same kind of work, because employers, anxious to increase their profits, ignore the advantages they derive from educated employes, and will not submit to increase of wages, unless compelled by outside pressure, or a combination of their employes.

4. It would enable him to master all branches of his business, qualify him to fill any higher position that might offer, with a corresponding increase of wages, and eventually enable him to employ himself, through associated labor, by which means the power of producing wealth would be increased to the highest degree.

5. It does. Not being in possession of statistical information, we are unable to state how much; but, if we compare the degree of education and the wealth-producing power of the industrial masses one hundred years ago with the power of producing wealth through new and improved methods of labor, and new and improved machinery derived from the higher degree of education of the industrial masses

of the present time, we answer that the additional power derived would be beyond computation.

6. Yes.

7. He would, if he studied his interest, choose those who possess superior education. Successful employers generally select those in their employ who possess superior education and intelligence to fill such positions. Employés unable to read or write, or merely possessing the rudiments of education, command no respect from those subject to their control, while experience has demonstrated that they create dissatisfaction, through being placed over the others as drivers.

8. We regard it as beneficial. It refines and elevates; it will enable them to use those faculties to resist wrong, and battle successfully for the right; secure comfort, and promote their happiness; destroy discontent, suppress crime, and make life a blessing instead of a curse. They do, in every respect. No, they are not, but quite the reverse. The higher the degree of education, the more substantial the character; they possess clearer ideas of the value of time and money, and utilize them; their morals are purer, and their social influence is superior to those less qualified to take part in mental strife. We believe that nations find their level through the amount of education possessed by their industrial masses. Ignorance means slavery, weakness, poverty, crime, and misery. Education insures liberty, strength, prosperity, virtue, and happiness.

LANE, EMMA A.

1. I have never failed to find, among the working men and women, one possessing an ordinary education, that did not perform his or her work more thoroughly than those who had been deprived of such qualifications.

2. From the Atlantic to the Mississippi. Shoemaking, type-setting, tailoring, jewelery.

3. They who can read and write exhibit more skill, and a desire that their work shall receive the full benefit of that skill, and also a wish to give a full equivalent to their employer. This last question I find difficult to answer; from one-third to one-half, in the majority of cases.

4. Any laborer who understands the arts and sciences that underlie his or her trade would be of more than double value to himself or herself, and the community in general.

5. It certainly does. One-half in some trades; more or less in others.

6. In most cases they would; but I often find employers who prefer ignorant labor, because it can be hired cheap, expecting the labor to be of an inferior quality, on that account.

7. Most of employers would prefer, for such positions, the best-educated, other things considered.

8. That it is most desirable. Those who possess mental culture are

more temperate, more thoughtful of their families, and better members of society. They desire to live in comfortable houses, with pleasant surroundings. They are more industrious than the untaught classes. They have a care for character, and try to maintain a good social standing in society. They are frugal, and desire to possess themselves of a competency for sickness and old-age. They are more apt to attend church, and show a deeper respect for the Sabbath ; and their influence is oftentimes of great benefit among their fellow-laborers.

PARR, JOHN.

1. I have. A decided difference.
2. Albany, New York. In printing and also in coopering.
3. In the printing business the latter class, of course, are incapable of learning the trade. In coopering I have observed a decided difference in favor of the former class ; from 15 to 25 per cent. at least.
4. That it would increase his ability there is no doubt, but the percentage I am unable to state positively, as some of the branches of education of which you speak have a direct bearing upon other branches of industry with which I am not conversant. In printing, the better the education the more proficient the pupils become in the art.
5. I am unable to give an accurate estimate of the increase, not having given the matter the requisite study ; but that an increase of knowledge increases the capacity of the workman cannot be doubted.
6. Certainly, he would.
7. The persons educated, most assuredly. I cannot see how a person unable to read and write could fill such a position in any occupation.
8. The educated workmen live better and with better surroundings ; are more industrious, less dissipated, and occupy a higher position in every sense than the untaught classes.

PEARSON, CHARLES W.

1. I have noticed that persons with a good common-school education were quicker to learn and to comprehend the work to be executed than those who had less learning. The amount of work depends more upon temperament.
2. Charlestown, Massachusetts. House and ship joinering.
3. The difference is not so marked between persons who can merely read and write and those who cannot as it is between those who have more learning. Of course reading and writing help the understanding ; and consequently increase the value of such persons. Skill depends more upon practice ; fidelity, to moral culture. It would be hard to tell just how much reading and writing would add to their productiveness. Their wages would depend more upon the market, although a man who knew his value would not work for low wages.
4. It is the same with the mechanic as with all others. Those who have the best education and know the most about their business are the most useful and command the best wages.

5. The greater a man's knowledge the greater his capacity. The intelligent man works with more ease, and devises ways and means for doing his work easier. But the inventive faculties seem to be a gift that learning helps but does not create.

6. Most certainly.

7. The man who would take an ignorant person for a foreman in preference to an educated one, all other things being equal, would, to say the least, be wanting in good judgment.

8. Here in New England, the working-people are just like other people. Culture softens and refines them; they are not a distinct race, but are human, and aspire to all the refinements of a higher life. I know of workingmen, who labor every day as joiners, who write and speak several languages, and are gentlemen in every sense of the word.

PETERS, E. T.

1. Yes.

2. In various parts of the country.

3. I cannot speak from observation, but I do not conceive that the mere ability to read and write would of itself alone add materially to the efficiency of the laborer, except as he might have occasion for the use of these acquirements in his occupation. But he who possesses these can scarcely help acquiring much knowledge, which he could not otherwise have obtained, and this is pretty sure to include some knowledge which will be helpful to him in his work.

4. I cannot undertake to state an estimate of the value of such branches of knowledge, but it is undoubtedly immense, especially when the branches studied have been intelligently chosen with reference to their bearing upon an occupation.

5. Undoubtedly. I have witnessed one impromptu invention by an intelligent mechanic, which would have been impossible to him, with all his intelligence, had he not studied chemistry. Incalculably. It is estimated that in Great Britain the work of 600,000,000 people is performed by less than 30,000,000, through the aid of labor-saving machinery which owes its existence to "inventive skill." That is, the producing power of man has thus been multiplied over twenty times within, perhaps, less than one century.

6. Yes, if employers themselves were all capable of estimating the indirect but real material value of intelligence. As a matter of fact, we see that some of them would rather import coolies; while others a few years ago were ready to fight for the privilege of introducing savage Africans as slaves.

7. For such positions employers would usually prefer persons of superior intelligence. An important use of education to the workingman, however, is that it tends to assist him in dispensing with employers and becoming an employer of himself; while one of the most deplorable results of popular ignorance is that it inevitably makes the many the drudges and slaves of the few.

8. Good in the main, and, if of the right kind, good altogether. I think the reverse is emphatically true, and that the seeming exceptions are due to special causes independent of mental culture. Of course it does not always happen that a taste for letters is combined with the best moral qualities, but such qualities, where they exist, are more likely to be improved than deteriorated by the cultivation of the intellect. The impressions I retain of my own observations bear out this view. The second of these questions, which I perceive I have skipped, may, I think, be safely answered in the affirmative, although I am unable to speak from careful observation.

SANFORD, AMOS.

1. Yes. A marked difference.

2. Columbus, Kansas. In all the occupations necessary to build up a thriving town on the prairies within six months' time, containing now 800 souls. My own employers are printers.

3. My answer to the first question is in the affirmative. In reply to the second, I would say one-half; that is, I mean to say, 50 per cent. I was raised on a farm. I would rather pay an educated farm-hand \$24 per month, than one who could not read and write, \$16. So with carpenters, I would pay \$3 per day in preference to \$2. In my printing-office I would prefer paying an educated printer \$20 per week rather than one who could barely read and write \$10, but of course one who could not read and write could not be employed at all.

4. I would say about the same per cent. above the other class, so that between those who cannot read and write and those possessing "these necessary qualifications," I would set down the difference at 100 per cent.

5. Certainly, but it is difficult to state how much this adds to "the wealth-producing power." Under the operation of our system of "patent rights," (a monopoly of the worst type,) the workingman who invents any improvements "lays down the shovel and the hoe," and never works any more, and his fellow-workmen must toil on and pour their earnings into his coffers, making him rich, while they remain poor and but little benefited in the end by his "invention."

6. He would. The common-school is the great lever which raises the workingman into a competence. Without it all would sink into poverty. The common-school should be made more effective. A reform is needed.

7. Those possessing "a superior education;" but such an education cannot be had without the common-school, and the education must be worked into the man in a practical manner. *The foundation for a superior education must be laid at home and in the common-school room.* It must be practical, gained little by little, "line upon line, precept upon precept."

8. I answer, "Yes," to the second question, and, "No," to the third. The comparison between the two is very great, yet I have observed

that those of the educated class who become dissipated are worse, and wield a greater influence for wrong, than the others. "The love of money is the root of all evil" in the case of educated workingmen. This love is not so great with the uneducated. As a rule, they only seek a bare subsistence.

SANBORN, A. R.

1. I have.

2. Sanbornton, N. H.; Dauvers, Massachusetts; Lawrence, Massachusetts; Topsham, Maine; New York City and Brooklyn. As laborers, farmers, artisans, and operatives.

3. I consider the advantage to be on the side of the educated; that it increases their skill and productiveness, makes their minds more prolific of expedients, more apt to learn, and raises them (the educated) higher in proportion to the extent of their education. In a majority of cases it would increase wages of such 10 per cent.

4. Ten per cent., at least.

6. He would.

7. He would undoubtedly require practical common-sense and good judgment. With these, the more education one has, the more his efficiency is increased.

8. As a general rule men are imitative—generally take their ideas as promulgated by others. Consequently, the better educated have a greater fund of information from which to draw, and are better able to put their ideas, original or acquired, in better form.

SOUTE, MARCUS.

1. In skill and aptitude, yes. I am not a close observer enough to give an opinion in regard to the amount of work done.

2. Middleborough, Massachusetts. Shoe business.

3. My idea is this: The better education a person possesses, the better able he is to grapple with the difficulties of life. But the mere ability to read and write would not make to the casual observer any perceptible difference in a man's skill or fidelity. Yet this small bit of learning would pave the way for more extended knowledge.

4. So far as my observation extends, those who have an ordinary common-school education are the best workmen and the trustiest. The totally ignorant class are almost invariably inferior workmen. The production of an inferior article is not a source of wealth, but quite the opposite, for it drains the pockets of the consumer, and adds but little to the general stock. The increase of wages would be large if no poor goods were manufactured, and we were to reckon then the purchasing power of money compared with the present.

5. I believe that a man who has had a generous education, say one who has been fitted for college, is not so good a routine workman. Their ambition is greater, they are seeking for new ways to do their work, trying

to produce better implements, and generally are busy on improvements, but they work less days in the year. As a general thing, their inventions are of but little benefit to themselves or the laborer, for the capitalist takes every machine that bids fair to succeed, closes it up in a patent, and gets the benefit.

6. He certainly ought to be. Education should be made compulsory. Laws should be passed making it a criminal offense to employ persons who could not read, write, and cipher.

7. I have no means of knowing what an employer would do. The majority of them are full of fancies. Many are anxious to keep the education of the people at a stand-still. They have no sympathy for a laboring man. Money is their object. They will go for it; and if they can get rich faster by crushing out the liberties of the laborer, they will try it on.

8. I look on mental culture as elevating, whether as applied to a workingman or a capitalist. Men with a good common-school education in this part do live in better houses, (in many cases owning them;) are not so dissipated nor so idle as those who are entirely ignorant of books. In economy, morality, and social influence, they will compare favorably with the business men of the place.

SOLOMON, PHINEAS.

1. Yes. Generally speaking, those who are the most intelligent are best educated, and show a much greater percentage of skill than do the uneducated. There are, of course, exceptions in both cases.

2. Boston and Westfield, Massachusetts; New York and Albany, New York. Cigar-making.

3. The uneducated as a class are the least productive, because their habits are not so regular, and because they are more given to intemperance, which, of course, produces carelessness and all other depressing influences on the mind. The more intelligent are decidedly the best producers, by at least, in my experience, 25 per cent. They have a greater regard for their moral and social standing, provide better for their families, are not unmindful or heedless of their responsibilities, strive to become skilled workmen, in order that they may continue in employment.

4. A knowledge of the arts and sciences has no direct application to cigar-making, but such knowledge would add much in the way that a fair education does, in a higher degree, however. I believe the workingman possessing a degree of education equal to that mentioned in the above interrogation would become an employer or superintendent, and if the case was general, they would become the dealers and sellers of their own produce.

5. It has not in the cigar business. Several mechanical methods have been tried, and have failed. Some are experimenting now. All that I

have seen failed to equal hand-labor. The enterprises generally ended disastrously to those who furnished the capital.

6. Certainly.

7. Without doubt, those possessing a superior education. They are the best judges of human nature, and would know how to instruct men in their wants, and could manage difficulties, overcome dissensions, and the scores of grievances that spring up among workmen. Again, those who were under them, appreciating their superiority, are more inclined to be reasonable. Besides, the workmen look for and expect such persons to be in charge of a business. They will not be jealous, as would be the case if the superintendent was *considered only their equal*. Their inferior would almost certainly breed discontent and its evil consequences.

8. Generally, the educated workingman is a better father, citizen, and neighbor; lives better, dresses better; is more industrious and saving; possesses a higher moral and social standing than the uneducated.

WHEELER, OREN S.

1. I have.

2. Milford, Massachusetts. Boot and shoe manufacturing.

3. In skilled labor I consider the man who can read and write worth 25 per cent. more than one who cannot.

4. One hundred per cent. In fact, one cannot be a good mechanic without most of the above qualifications.

5. Most of the machinery now in use by laborers was invented by laboring men, but they do not receive that benefit they should. The manufacturer receives 95 per cent. and the laborer 5, or in that ratio. In my judgment, machinery adds from 1 to 300 per cent.

6. He would.

7. An uneducated foreman would be worthless in New England, even at digging ditches.

8. Mental culture is everything to the laborer. It raises him and his family from the hovel to the castle. It drives out intemperance and vice, and places in a neat, happy home books, music, and a happy family. God save our common-schools!

QUESTIONS TO OBSERVERS.

1. Have you observed a difference in the skill, aptitude, or the amount of work executed by persons arising from a difference in their education, and independent of their natural abilities?

2. Where were your observations made; town; State; in what occupation were the laborers engaged?

3. Do those who can read and write, and who merely possess these rudiments of education, other things being equal, show any greater

skill and fidelity as laborers, skilled or unskilled, or as artisans, than do those who are not able to read and write; and, if so, how much would such additional skill tend to increase the productiveness of their services, and consequently their wages?

4. What increase of ability would a still higher degree of education, a knowledge of the arts and sciences that underlie his occupation, such as a good, practical knowledge of arithmetic, book-keeping, algebra, drawing, &c., give the laborer in the power of producing wealth, and how much would it increase his wages?

5. Does this and still further acquisitions of knowledge increase the capacity of the workingman to meet the exigency of his labor by new methods, or in improvements in implements or machinery; and, if so, how much does this inventive skill add to the power of producing wealth?

6. Would a person who had been trained in the common-school be generally preferred for the ordinary uses for which labor might be employed, over one who had not enjoyed that advantage?

7. Whom would an employer generally choose for positions of trust, such as superintendents, persons unable to read and write, or those having the rudiments of education, or those possessing a superior education, all other things, such as skill, strength, and fidelity, being equal?

8. What do you regard the effect of mental culture upon the personal and social habits of workingmen? Do they, as a class, live in better houses, or with better surroundings? Are they more idle and dissipated than the untaught classes? How will they compare for character, for economy, morality, and social influence, among their fellows?

OBSERVERS REPLYING.

Bingham, R., Palmyra, Pennsylvania.

Deering, Rev. C. S., Mendocino, California.

Gager, S. D., Eugene City, Oregon.

Geary, Rev. Ed. R., Albany, Oregon.

Hudson, Samuel, Needham, Massachusetts.

Swayne, Judge J. S., Memphis, Tennessee.

Thompson, Rev. John R., Olympia Territory.

Todd, James S., Arcata, California.

Webber, Rev. L. P., Anaheim, California.

Wells, Rev. Robert R., Healdsburg, California.

White, Rev. A. F., Carson, Nevada.

Wylie, Rev. Richard, Napa, California.

Parker, John, Hazleton, Pennsylvania, editor *Anthracite Monitor*.

ANSWERS.

BINGHAM, R.

1. I have.
2. Palmyra, Pike County, Pennsylvania, and Camden, New Jersey. Farming, lumbering, rafting, sawing and selecting lumber, and erecting buildings.
3. In farming, lumbering, rafting, and all common-labor, 10 per cent. As carpenters, overseers, foremen, and superintendents, 15 per cent.
4. Carpenters, overseers, or foremen, and superintendents, 25 per cent.
5. It does; and increases the means of production 10 per cent.
6. Yes.
7. Those possessing a superior education.
8. I think mental culture improves the habits. They do. They are not. They are superior in character, economy, morality, and social influence. While I believe that literary education improves the morals of a people, I have still greater faith in a knowledge of skillful labor and industrious habits. I would have one-half the time and money devoted to that end. If the Government would provide schools in which skillful labor was taught, I believe nothing would be lost from literary acquirements, but that we should find an improvement in all the essential qualities of a great and happy people. I would see compulsory measures adopted in the case of all idle and dissolute young persons. So overstocked are the professions and so-called genteel occupations, that university and college graduates must work in them from one to five years, at less than 31 cents per day, with physical development equal to the earning of \$1.50 at common labor, or from \$2.50 to \$4 per day in skilled labor, if they had been educated for it. Wherever there is a jail I would have a reform-school, to which all common-loungers, beggars, and frequenters of drinking-saloons should be sentenced, and there taught to work, read, and write.

DEERING, Rev. CHARLES S.

1. I have. Many places cannot be properly filled without a certain degree of education. Such positions as assorting, measuring, tallying, and handling of lumber.
2. Big River Mill, Mendocino, California. Milling, shipping of lumber, planing lumber, rafting, felling trees, cross-cut sawing, barking mill-logs, teaming, hauling logs, boating supplies to camp, &c.
3. Give me a man of good common-school education for almost any position, and he is worth more to me by 25 to 30 per cent. than an ignorant man, who does not read, neither understands mathematics. But there are positions for cheap laborers. How shall we fill them? is the question. A Digger Indian can shovel, bark logs, &c., without any education; so can John Chinaman. If we educate all, Where will we get the cheap laborer? is the question.
4. For many positions, double.

5. "Paul, thou art beside thyself; too much learning hath made thee mad." This amount of learning has excluded him from this catalogue of *workingmen*. He has spent his physical strength mentally. He need not "hold or drive," but direct.

6. I think he would.

7. One who possesses a superior education.

8. They make an intelligent reading community; make pleasant homes and better surroundings.

GAGER, S. D.

1. I have observed such difference in skill and aptitude. If the amount is equal, neatness and taste are always in favor of the educated. The refinement of mind is seen in the handiwork.

2. Bloomingburgh, New York, and Lane County, Oregon. Different ones; blacksmithing, wagon-making, and carpentering, where work is done by rule; and in farming, where head-work is required.

3. They certainly show more skill; are less liable to have to undo or do over again their work from errors in their calculation. As to fidelity, I wish not to be a judge. In answer to the second question, I relate that two carpenters, in my vicinity, recently spent a whole day "laying off" a place for a barn, owing to a want of education sufficient to make their calculations. An educated man could have "laid off" and framed the same in a day, thus saving to the employer the wages and board of two days. Twelve dollars were paid in wages and board for three dollars' worth of work.

4. From my own practical knowledge of mechanics, I am led to believe that the increased ability of the laborer is in proportion to the degree of his education. With the ignorant man you employ only the hands; with the educated man you employ the hands, with a head and capacity to guide them. The educated man is less liable to use material through mistake, is more accurate, and has a capacity for producing wealth and obtaining wages equal to one-half over his illiterate competitor.

5. An ignorant man and a skillful mechanic I have never found in the same person. The greater acquisition of knowledge, the greater capacity the workman displayed in suggesting and putting in operation improved methods of labor by machinery, and also in managing those implements already in use. How much this would add to his power of producing wealth would depend on the kind of labor; but more than the difference in wages between a skillful and unskillful workman.

6. He would have the decided preference.

7. I consider the last class named decidedly the best qualified for the positions mentioned.

8. They are more refined, neat and tidy in person, and tasty in their surroundings. They are not, but generally the reverse. In regard to the last question, while there are many educated men whose character and influence are bad, yet the preponderance is in favor of education.

Designing men work on the ignorant. When education becomes more universal, the material upon which they operate will be greatly diminished.

In regard to "adding such other information," &c., I may say that experience and observation in this country, for nearly twenty years, have shown me that education is an excellent staff to rest upon. Many are the instances where uneducated men selected the choicest lands, but through mismanagement, want of tact or economy, or, more properly, a want of head-work, they have fallen behind, had to sell out, and "squat" on the brush-claims at the outskirts of the settlements. In passing through the country, the appearance of a neat, tidy dwelling, with appropriate surroundings, leads the stranger to observe, "There is a Yankee, I will assure you;" while a wretched cabin, with every indication of squalid poverty within and without, leads the same man to remark, "A Missourian, you bet." Education leads to a display of culture and refinement. Ignorance leaves the mind like a diamond untouched by the lapidary. Education gives to young men especially a fund of enjoyment in pursuing their books at home; while the ignorant seek their amusements in saloons and with low, dissipated company. I regard education, and the cultivation of a taste for literary pursuits as far more effectual to restrain vice and immorality than any prohibitory laws, while the young are left to grow up in ignorance.

GEARY, Rev. ED. R.

1. The tendency to utilize mathematical, philosophical, and chemical sciences, the wide range of application in the arts, the demands of population and wealth, the competition of skill, and the rivalry of enterprise, constantly increase the discrimination in favor of educated over uneducated minds. Such are my observations where mind governs the hand or machine.

2. Virginia, Alabama, Ohio, Oregon, the Canadas, Mexico, Central America, among whites, blacks, and Indians, in town and country, Mechanical and agricultural pursuits and ordinary labor, the building of machinery and operating it in grist and saw mills, woolen-factories, manufacture of wooden type, construction of canals and railroads, mining for precious and useful metals, northern and southern farming and planting, and a miscellaneous variety of domestic and outdoor labor, being an observer (though neither artisan nor laborer) and teacher.

3. In ordinary labor the difference is not so obvious, but in the laboratory education it is most apparent. In architecture, and wherever an archetype of excellence in beauty or utility, with combinations to achieve a certain result, exists in the mind, it is the offspring of educated thought. The laws of proportion and perspective requisite for models, draughts, and specifications, demand education to know and apply them. The workman that has these draughts and models before him can never give objectivity to these creations of thought without being himself taught to

think. Here one mind educated can operate a thousand hands or their equivalent in mechanism. But this is aside from the inquiry. Ignorance ever fails in agriculture. This is the conviction of a wide observation. As to fidelity, it is the result of education of the moral sense. Mere culture of intellect and taste will not replace this. As to reading and writing, these rudiments are the key to all knowledge; but the key in the pocket does not open the door. It must be had and used.

4. The measure of advantage here is greatly influenced and modified, diminished or enhanced, by other social conditions. Passing this, knowledge and reflection are the twin offsprings of education. They constitute largely the stores from which we draw to conduct the enterprises and meet the emergencies of life. Even the apparent intuitions of the mind are supplied from forgotten sources. The education referred to affords the mind *formula* by which to reach and then to test the accuracy of its conclusions. The education of the masses operates, like the forces of nature or the laws of progress, irresistibly to place the race on a higher plane—a force that, in raising a continent, does not level the mountains. Up with the masses; they will be better paid, for it pays in longer life and greater prosperity to all.

6. The common-school has as yet in our country no fixed character, but assuming reading, writing, the art of computing, &c., as its products, other things equal, I have found such decidedly preferable. Their education was never in the way of their effectiveness, and very often and in every way an advantage.

7. When in charge of a very large Indian superintendency, I found the service suffer quite as much from the lack of education in some agents and employés as in the want of honesty in others. I always found ignorance in many palpable respects a detriment; education, however extensive or refined, no injury. Ignorance antagonizes with knowledge, as strength with weakness, as dishonesty with integrity, as disability with power, as all evil does with good. Yet education must be adapted to its uses. Profundity in the calculus will not make an efficient trapper; but it will not detract from this mountain accomplishment. Make education practical; don't call men educated who have looked at light till stone-blind. Then everywhere, evermore, will it be the gauge of superiority.

8. The reading-rooms, social-halls, lyceums, &c., of New-England operatives, in contrast with the bar-saloons and low resorts of those of Old England, together with their dwellings, dress, furniture, economy, and social status, afford a decided answer in favor of mental and moral culture. Virtue is sometimes found among the rude and untaught, a contingency, like that of oil and water showing an affinity, while science and thought are her natural and genial associates. By all means educate labor; let science direct her hand; literature cheer her toil; a knowledge of the rights of person and property protect her interests; the relation of capital and industry impress the importance of peace

and order; while moral culture and religion will cheer her lot and ally her to hopes immortal.

HUDSON, SAMUEL.

1. Education has little to do with helping a man in the art of knitting; but in other branches of mechanics I have observed a want of knowledge on the part of those who have not had the advantage of education.

2. Chiefly in England, and some in Massachusetts; bricklaying, plasterers, mechanics, farming, &c., are all helped by education, but in a trade such as knitting, it helps them very little, because it is all done by rule.

3. Ignorance and intemperance go hand in hand; and among these, especially the unskilled laborer, I find the least fidelity as laborers; and the most ungovernable in case of dispute between employer and employé are those who can neither read nor write. I believe that the ability to read and write would tend materially to increase the quality and productiveness of services rendered either as artisans or laborers, but to what extent I cannot say.

4. It seems to me, in some trades a knowledge of the arts, sciences, mentioned in this place, would increase the producing power of the laborer one-half, in some one-third, others one-fourth, and some less, but there are very few but what would be benefited thereby.

5. Yes, considerably; but I have not taken into consideration to what extent.

6. I suppose he would generally, but there are employers who would employ incompetent workmen at low wages, if the produce were of worse quality, if they could palm it on the consumer.

7. I have known some who could neither read nor write that have managed or superintended business for themselves and others successfully, but the ability to read and write is a great help to them. From what I have seen, I believe those who have the advantage of education to be the best fitted for positions of trust.

8. They seek better surroundings, dress better and more fashionably, and live in better houses, which benefits other trades; they are better neighbors, better companions, more tractable, social; they will compare favorably with the untaught classes; they are better and more frequent customers in the labor market, and thereby help to increase the wealth of the nation because of the increased demand for the laborer's services.

SWAYNE, Judge J. S.

1. Certainly. It is very apparent to every observer.

2. In the South generally, where I have always lived, and now live. In agriculture and mechanism.

3. Certainly, most visibly so. Very greatly; I would say, at least a third more.

4. The preceding is an answer.
5. I should think such is clearly its tendency and effect. Greatly and necessarily so.
6. Yes, because such an one is better able to promote the interest of the employer.
7. The latter, because better qualified.
8. It refines and elevates their habits, and makes them better citizens and men every way. Yes. Not at all. Most favorably.

THOMPSON, JOHN R.

1. It is difficult in the majority of cases to discriminate between the effects of education and natural ability; but I have often observed a difference between educated and uneducated workmen, particularly in the departments of skilled labor.
2. In various towns in Canada, and the eastern British provinces, as well as in the rural districts of those countries. As farmers, farm-servants, apprentices learning various mechanical trades, and full-pay tradesmen, and master-mechanics.
3. They do show greater skill, though perhaps not greater fidelity. In skilled laborers or artisans it should, on an average, increase their wages by one-fourth.
4. This question is difficult to answer by figures, but we know that nearly all the great mechanical, and many of the scientific discoveries, which make our age so vastly superior in luxury and labor-saving to the years that are past, have been due to educated mechanics and working-men. Those inventions have increased man's work-producing ability by many hundred per cent.
5. 1st, I should certainly say "Yes" to this. 2d, largely.
6. As a skilled laborer or mechanic, yes. Where the labor of mere animal labor-power is required, and the laborer is a mere machine, acting under the eye of an overseer, education does not often enable him to do more work.
7. Most certainly, those possessing a superior education.
8. Mental culture is elevating, most certainly. Educated men will endeavor to bring their surroundings into harmony with the order of their own thoughts. Education makes men ambitious to improve themselves, their homes, and their surroundings. This surely tends to lessen rather than increase dissipation. In weight of character, true economy, morality, and social influence, men of education and culture stand far above the ignorant masses. We have only to open our eyes to see instances of this every day of our lives. Of course there are exceptions to every rule, and it is a sad fact that education far too often seems only to make men clever rascals. I use the word *clever* in the English sense, corresponding to the Americanism "*smart*." I hold to the principle that the educated thinking-men will always rule the balance of their fellows. I don't mean by education, a mere knowledge of letters and figures;

almost any man can gain a knowledge of these, and many thousands of men are *learned*, in the common meaning of the term, who are *not* educated, who possess very little mental culture, and who do very little thinking of their own; they are satisfied with adapting the result of other people's thoughts. But, in my opinion, a truly educated man, one who thinks as well as reads, will always be a king among his fellows.

TODD, Rev. JAMES S.

1. The nature of my profession is such that my observations pertain only to the intellectual and moral conditions of society.
2. Arcata, California; farming, cattle-raising, and lumbering.
3. Unable to answer.
4. My opinion is worth nothing.
5. Have no facts by which to determine.
6. Yes; but among farmers an employé is preferred who is less wise than the employer.
7. Those who have superior education. In fact, the foremen in the saw-mills are educated men; knowledge is essential.
8. Mental culture is the twin-sister of moral culture, and is conducive to neatness, industry, temperance; in short, to all that goes to make up a perfect manhood.

WEBBER, Rev. L. P.

1. Yes.
2. Stone-quarries; Dayton, Ohio; Austin, Nevada; Santa Clara, California; mines of Nevada; farms of various places, &c. Mechanical, as well as at common labor.
3. I should think from 10 to 50 per cent.; but sometimes natural tact does much to compensate for want of education. When formerly employing Irish laborers in quarries, I found that the better educated more easily understood the art of applying forces to move large bodies of rock and to adjust them. My "best-hand" with pick and shovel was a slightly-framed but liberally-educated man; hence his position.
4. Depends much upon in what engaged. I should think from 20 to 50 per cent.; would perhaps average 30 per cent. It is certainly great.
5. The class is smaller, I think, which is greatly aided thus. Some are aided very greatly, but I believe the masses are not greatly benefited by education beyond that intimated in question four.
6. Beyond doubt; unless the other enjoyed like advantages. I believe the common-school tends to utilize acquirements; private instruction leaves defects.
7. Those possessing a superior education.
8. Undoubtedly elevating. Greater refinement will, of course, seek better surroundings. Hard to say whether the additional money secured does not, in case of the highly successful, bring more vices; but the mid-

ple classes are certainly superior in character. Money and pride, not education, are responsible.

WELLS, Rev. ROBERT R.

1. I have; and a very decided difference.
2. In the city of Baltimore, and elsewhere in the State of Maryland, and other States. In the city, mostly in in-door labor. In the country, in tilling the soil and other occupations.
3. To a very general extent, I think they do; but the degree of additional skill and increase of wages must depend upon the circumstances attending each individual case. This is my judgment.
4. This also, in my judgment, will depend upon the circumstances of each individual case.
5. Most unquestionably the possession of knowledge will aid "the workingman to meet the exigencies" of this position, both in the manner of doing his work and in the improvement or the invention of the implements with which he does it. But to what extent this would increase his power to produce wealth I cannot say.
6. I think so.
7. Decidedly; the more thorough and extended the education, the better; other things, as you say, being equal.
8. In general, most favorably. The effect of mental culture among all classes I regard as being greatly beneficial, both to the individuals themselves and the community in which they live. In passing through the different sections of our own country, the very houses and their surroundings will indicate something of the antecedents and the character of their occupants.

WHITE, Rev. A. F.

1. Yes; such difference is apparent in many instances in all points designated.
2. In the various mills, districts, and towns of Nevada; mining, mechanic arts, and agriculture.
3. They do, but the difference is not so perceptible as in a higher grade of intelligence. Intelligent labor is worth from 25 to 50 per cent. more in the conduct of mining and the reduction of ores than the labor of men who cannot read. In many positions about the mines and mills men who cannot read are worthless. Generally, I regard the labor of men who read worth about double that of men who do not read.
4. To the first part of the question I am safe in saying, it would increase his ability 100 per cent. I think it would increase his wages in a majority of cases, 50 per cent.
5. It does. Had it not been for the inventive skill of our most intelligent workingmen the mineral resources of the Pacific coast could not have been developed as they are to-day. Without experience, without a

knowledge of appropriate machinery, and without skill in the reduction of ores, in a few years we have excelled the world in the perfection of our machinery and in the readiness with which the most rebellious ores are reduced.

6. He would, in all cases, and I think, in all occupations. Uneducated men are not in demand on the Pacific coast. Even the Chinese all read and write in their language.

7. The higher the attainments in knowledge the more valuable the services rendered, according to the conditions specified. I have never known a man to act as foreman or superintendent in any case who could not read and write. The responsibilities of such positions are too great to be met by illiterate men.

8. In every respect beneficial. They live in better houses, have more tasteful surroundings, are less indolent, and less likely to be dissipated. They are more economical, have a higher standard of morality, and are better neighbors and citizens than the ignorant and unlearned. The terrible calamity, which resulted in the death of several prominent men and in the mangling of limbs and permanent maiming of many others, on the Pacific Railroad, a little more than a year ago, within a mile of where I am writing, (San Leandro, California,) was the result of ignorance on the part of the switch-tender. He was carefully instructed in his duties, was furnished with appropriate time-tables, and yet on the morning of the fatal day, when the road and valley were obscured by a heavy fog, he sent a powerful train, running twenty miles per hour, into another running at the same speed in the opposite direction. More than twenty lives were lost and many were made cripples for life. Two engines, tenders, and several cars were ruined. Hundreds of thousands of dollars would be required to cover the damages. Afterward, in court, it was proved that the switch-tender could not read.

WYLIE, REV. RICHARD.

1. I have observed a difference in the skill of persons educated; also in the amount of work performed by them.

2. Washington County, New York. Farming.

3. Other things being equal, I should consider the educated man worth one-sixth more wages, even as a laborer on a farm; as artisans, I should consider the odds in favor of the educated man to be doubled at least.

4. As by such an education a vast number of occupations would be opened to the man, to which the totally uneducated can have no access, he could gain twice as much wages.

5. His inventive skill will make his labor lighter to himself; the value of that inventive skill must be altogether dependent on the amount of that skill which he possesses.

6. Other things being equal, educated employers would prefer educated laborers.

7. Those having the rudiments of education, most certainly.

8. They live in better houses, with better surroundings. They are more industrious and less dissipated than the untaught classes. They will compare advantageously with their fellows.

PARKER, JOHN, (editor Monitor.)

1. I have.

2. In the anthracite coal-fields of Pennsylvania. Mining, principally.

3. This is a difficult question to answer with any degree of minuteness. It is my experience that the better men go less to the rum-shops, pay greater attention to their families and to self-culture by reading, &c., and, as a natural consequence, are better able physically to encounter the difficulties attendant upon their calling.

4. I deem a thorough knowledge of how best to provide the dank recesses of coal mines with the quantity of fresh air requisite to dissipate noxious gases that there accumulate, and sustain the physical strength of the miner, and some knowledge of geology, essential to a thorough understanding of how to mine coal. The branches you mention would, of course, assist them, but not to so great an extent as those to which I have alluded.

5. I believe that the cost of coal to consumers would be greatly reduced by improvements in mining, which might be made by the miner, if he possessed the requisite intelligence. Operators and dealers, who have had the necessary education, lack experience; besides which they seldom, if ever, venture into the mines for fear of their dangers.

6. Decidedly so; because he would be a better miner, and because he would be better able to resist the infamous oppression of those who now take advantage of his ignorance to rob him of the fruits of his labor.

7. As brotherly-love and education generally travel hand in hand—though we have many instances (exceptional, nevertheless) of intense affection for each other among the most ignorant—the better educated the man the better foreman or “boss” is he likely to be.

8. I have already answered this question, but here repeat that, so far as my experience goes, as a rule, ordinary dissipation has much less attraction for the educated than the uneducated, and, of course, those who dissipate least save most, and are able to provide themselves and families with creature comforts in greater proportion than their more careless fellows. They educate their children, pay greater attention to their moral welfare, and invariably become better citizens. I would not like to say that the mere ability to read and write adds one-fourth to the productive power of a miner, because I have never actually tested the thing; but, as an individual, had I the choice between the two, I should employ the man who could read and write, other things being equal, in preference to him who cannot.

PRESENT CONDITION OF EDUCATION
AMONG THE
WORKING-CLASSES IN THE UNITED STATES,
WITH A
BRIEF STATEMENT OF THE ATTEMPTS AT TECHNICAL AND
ARTISAN EDUCATION IN ENGLAND AND
UPON THE CONTINENT,
BY
R. J. HINTON.

PRESENT CONDITION OF EDUCATION AMONG THE WORKING-CLASSES.

In "The Reign of Law," by the Duke of Argyle, there is a significant chapter, under the title of "Law in Politics," in which the writer, reasoning from the broadest postulates of the English economic school, while sustaining in trade, production, and exchange the doctrine of free competition, yet finds, also, that there is in the same principle, which he holds to be deduced from divine and natural order, more than equal warrant for the use of restraint over it by government, through the operation of the collective will as embodied in law, when the application of this principle of free competition interferes with the welfare of men and women, either by retarding and arresting their higher development, or by excluding any portions of society from the means through which such development may be achieved. The author says: "There are certain results for the attainment of which the natural instincts of individual men not only may be trusted, but *must* be trusted as the best and, indeed, the only guide. There are other results of which, as a rule, those instincts will take no heed whatever, and for the attainment of which, if they are to be attained at all, the higher faculties of our nature must impose their will in authoritative expressions of human law. In all those operations which have for their immediate result the getting of wealth, there is a sagacity and cunning in the instincts of labor and in the love of gain compared to which all legislative wisdom is ignorance and folly. But the instincts of labor, having for their conscious purpose the acquisition of wealth, are instincts which, under the stimulus and necessities of modern society, are blind to all other results whatever. They override even the love of life; they silence even the fear of death. * * * If, therefore, there be some things desirable or needful for a community other than the acquisition of wealth, if mental ignorance and physical degeneracy be evils dangerous to social and political prosperity, then those results cannot, and must not, be trusted to the instincts of individual men."* The author then proceeds to show that the motives dictating the course of individuals in this regard are always imperious in their nature. The individual will is too powerless to contend with them. The motives that arise from the conditions of society are often overpowering. "These constitute an aggregate of power, tending in one direction, which makes the resulting action of mind as certain as the action of inanimate force."

* The Reign of Law, pp. 358-359.

The Duke of Argyle applies this rule to the conditions of English labor under the high-pressure system of manufacturing production, which scientific economy and organized industry have wrought out. He regards it as absolutely necessary for society to regulate such operations and prevent their evils wherever men and women are concerned. "Power to control such evils has been given to man, and he is bound to use it." This argument is introductory to a defense of the English factory-acts, restricting the hours of labor, regulating the employment of women and children, and directing and enforcing the means of education by such instrumentalities as compulsory attendance, half-time schools, and all the other ameliorative processes which Great Britain is slowly realizing are so much more potent toward the solution of her terrible problem of pauperism than attempts at repression, all of which have so signally failed.

The author quoted from only expresses in formal and philosophical phraseology the principle which underlies all effort, through legislative and administrative forms, to improve the conditions in which man moves, and aid the peaceful progress of the race to that recognition of the normal authority of our highest faculties, which is the essential condition of a just and harmonious society.

HOW WE APPLY THE PRINCIPLE.

In the United States we have acted, so far as the matter of popular education is concerned, upon the views set forth by the Duke of Argyle. The other matters, to which his application more especially pertains, we have not hitherto deemed it necessary for us to consider. Yet they are forcing themselves on our attention. The association or organization of labor tends to produce changes involving the very educational conditions on which we have hitherto justly prided ourselves. The growth of modern industry may render necessary a reconsideration on our part of the adaptability of our school-system to meet all the wants of the society that is now being formed. We are not exempt from the social changes which science and organization produce, nor do we desire to be. But we must consider these changes, or we shall find ourselves inadequately prepared to meet the issues they involve. General intelligence is an excellent frame-work, but it will not meet all the requirements new conditions may impose, unless it also accepts the situation. Sir John Pakington, a leading conservative member of the British House of Commons, who presided at the annual congress of the Social Science Association, recently held in Leeds, in his opening address quoted Mr. Cobden as saying, after the British commissioner returned from the International Exhibition of 1853, held in New York, that "it had oozed out that the commissioner had found a degree of intelligence among the American operatives, which convinced him that, if we were to hold our own, if we were not to fall back to the rear in the race of

nations, we must educate our people, so as to put them on a level with the educated artisans of the United States."

There is considerable danger, however much the assertion may surprise the mass of our people, that such a tribute cannot be truthfully repeated.

OUR PERILS.

Causes are in operation which, it is evident, have already produced great changes in the character of our working-people, skilled and unskilled. Labor's tidal wave of agitation, which has been so momentous in its movements across the Atlantic, has at last reached our shores, and affects the general sentiment.

That agitation grows more importunate with every year. Education of hand and brain, moral and material, is the chief ingredient to accomplish a peaceful and just solution of this or any other issue that affects the common weal. Skilled labor is a powerful lever for civilization, but it must be skill which has not only natural ability and manual dexterity, but acquired and appropriate knowledge and rectitude of purpose, to sustain itself. Skill of the muscle is excellent, but a trained brain gives force and direction to its power. Industrial and commercial movements are only secured by peace. That can only be achieved by education; by a certainty that each individual has free opportunity, and that the community is in the main under the direction of its better purposes. Labor needs security for progress. Educated skill is the best of constables. Is it not a matter of joy to feel that the school-house is better than the jail? It is estimated that but 2 per cent. of the inmates of our penitentiaries belong to the professional class, and 16 per cent. to the farming and mechanic class, while 82 per cent. come from the great mass of unskilled laborers. Of the 16 per cent. included in the second division, only about 6 per cent. are skilled artisans and mechanics.

GROWING IGNORANCE AMONG FACTORY OPERATIVES.

What more striking evidence can be afforded than this, of the economic and political value of such education as is directly related to the training of skilled labor? In other words, in the United States we must take this matter of technical instruction into account, as a necessary constituent of any comprehensive system of public education, or find ourselves lagging sadly behind, alike materially and morally. Without it we shall lose our place as a leading nation. Such facts as those presented in reports made by the Massachusetts Bureau of Labor Statistics are pregnant proofs of the existence of marked tendencies to mere machine-labor, and of the substitution of a coarse and illiterate laboring population in sections where, a generation since, we found employed one vigorous and intelligent, "native and to the manner born." The last report from that bureau speaks of the great change in the

character of the agricultural population of New England, "by the substitution of ignorant and unskilled foreign labor for the intelligent school-taught labor of" a former period.

It gives startling proofs of this change in other employments. The growing ignorance among factory operatives is a prominent feature of the testimony collected. In one Massachusetts establishment, out of a working force of 1,600 persons, there were 500 who could neither read nor write. In the statistics of 73 woolen-mills, it appears that among their employes were 182 wholly illiterate adults; while out of 464 children employed, 284 were reported who had not been sent to school. It is estimated that there are 20,000 illiterate children growing up in the city of New York. These are eager recruits for the sad army of the "dangerous classes." In Massachusetts it is quite evident that the alarming increase of an illiterate population is largely due to the over-long hours of labor, and, as a consequence, physical inability for study. The English factory-acts scrupulously guard against this abuse. Half-time schools must be organized in connection with all establishments where the young are employed. Three hours per day for school is made mandatory. Children, allowed to be employed at all, work five hours and a half per day for five days in the week, and three hours and a half on the sixth; in all thirty-one laboring hours per week. Eighteen hours per week are passed in the school-room. In Massachusetts, however, the working-day for the factory hand is eleven hours, sixty-six per week, for adult and child alike. No half-time school is established by law, though three are in operation. No system of factory inspection prevails. These principles of British legislation have been applied by Parliament to all employments in which children are engaged, whether in factory, shop, or house. Of the value of the half-time schools in England, abundant testimony is given. The truth is, that Great Britain is making most strenuous efforts to not only reach but rival the skill of her industrial competitors. The usual argument made there for all such efforts is the profit it will bring; the ease with which the world's trade will be commanded, and that supremacy as the "workshop of the world," which thereby Great Britain will be enabled to maintain. In America, where our chief end and purpose must necessarily be the making of better men and women—citizens and sovereigns better fitted to fulfill the greater obligations a republic imposes on its people—we can afford to, nay, must, put the argument on loftier and nobler grounds.

PROGRESS OF TECHNICAL EDUCATION IN ENGLAND.

Mr. Baines, M. P. for Leeds, Yorkshire, and for many years past the editor of the Leeds Mercury, a paper famous for its anti-slavery character, presided over the educational section in the British Social Science Congress for 1871. Some facts presented by him during the course of an able address illustrate quite forcibly the efforts making by England to train her skilled artisans. Referring to the wonderful progress made during

the last fifty years in the matter of education, Mr. Baines spoke of the formation of mechanics' institutes and other similar agencies. In Yorkshire, he said, there was a union of these institutes formed thirty-four years ago. It does not include them all, but its last annual report embraced 114 institutes, having an aggregate membership of 27,650, and with libraries numbering in all over 100,000 volumes. The Leeds Mechanics' Institute alone has a membership of 2,648 persons, with 1,212 pupils in attendance on its day and evening classes. In all these institutions there are science classes organized, reporting to the proper functionary in the privy council, receiving government grants, and subject to its official inspection. The science students of the Leeds institute received, at last year's examination, two medals of silver and bronze, 15 Queen's prizes, and 137 certificates of proficiency. This, Mr. Baines remarked, was only one of a thousand similar institutes teaching the arts and sciences to many thousands of young English artisans. A school of arts attached to the one at Leeds has an annual exhibition of students' works. The Young Men's Christian Association of the same city also maintains, like all its kindred associations in the manufacturing, pottery, and iron districts, large art classes, at which instruction is furnished free. The Leeds association stood second in the national examinations. At an exhibition given by their classes, there were 250 works placed on public view. The number of prizes and certificates was 113; their drawing classes numbered, in 1870, 249, and, in 1871, 352 members. A college of science is being organized at Leeds, which will receive students from the mechanics' institutes and other classes, pushing their studies to higher planes.

Even more striking evidences of the educational work were given. The Social Science Congress devoted a large portion of its sessions to this subject, its discussions especially dwelling on the necessity of technical training. Mr. Baines said that, fifty years since, only one in seventeen had received any education. Now it was about one in seven. The government inspectors reported, in 1870, 1,551,806 pupils in attendance on schools under their supervision. In 1871 they had reported an increase of 300,000, making in all 1,850,000 persons. But the special efforts made in the direction of technical instruction are forcibly shown by the following: A department of science and art was organized in 1854, and placed under charge of the privy council. Aid was granted to schools and institutes which included science classes in their programme. In 1860, only 9 such classes existed; in 1865, they numbered 120; in 1871, 943. In 1860 they had 500 scholars; in 1865, 5,479; in 1871, 38,015 were in attendance. Besides these, there were, during the last year, 117 schools of art, with 20,290 students. Similar elementary instruction was given in drawing, &c., 1,350 schools, having 187,916 scholars. In 1855 only 29,498 children received such instruction. Perhaps, one of the best presentations of a reason for elementary technical training is given in the following extract from Mr. Baines's address:

"Mr. George Müller, the benevolent and able founder of the great Ashly Down Orphanages, Bristol, maintains that nature has formed every child for some distinct pursuit—to be a mechanic, a chemist, an artist, a shoemaker, a printer, and so forth; and he delays the choice of occupations till the boys are nearly ready to be apprenticed. In elementary schools there must be a foundation of general knowledge; and nearly all children are found to be capable of learning all the branches usually considered indispensable, if they begin early and are well taught. The Germans have a saying that "Every child who can speak may be taught to sing, and every child who can write may be taught to draw." The object of school, then, should be to teach the indispensable subjects to all, and to make a wise adaptation of the other subjects to the special talents of the scholars. But there is no reason why our first men of science, our first engineers, architects, artists, and manufacturers should not have their peculiar gifts discovered, and the foundations of their technical training laid, even before they quit the elementary school."

Another notable feature of English effort is the demand made for the more thorough training of women, not only in what some one has aptly termed the "noble profession of a matron," but in all branches of skilled labor, for which taste and physical fitness make them suitable. At Belfast, Ireland, there is the "Queen's Institute," with from 300 to 400 female students, devoted to such training. A demand is made also for the application of the half-time system to women employed in factories, mills, &c. No provision is made by society for the technical education of women. At a recent English conference it was shown that a good deal of valuable work was being done by voluntary effort in this direction.

At the Social Science Congress already referred to, some of the most interesting papers were prepared and read by ladies, discussing at length the best methods of training their own sex. The need of such training was held to be general. All were liable to become house-keepers; all should be fitted therefor. Few persons could tell when misfortune might compel them to labor for remuneration. The need of skilled industry for women was forcibly illustrated during the debates over the "contagious diseases" and "social evil" acts. The want of honest avenues to labor quite commonly drove women to worse than dishonest methods. Industrial skill and opportunity were the keys to this as to many other sociological problems.

POLITICAL ECONOMY AS A BRANCH OF ELEMENTARY EDUCATION.

In the broadest sense, no subjects are more intimately associated with education and labor than those which belong to the relations of labor to capital. If it be well and profitable for the working dyer to understand the chemical components of the material in which he works, it cannot be less profitable, and may be in a higher sense even more so, for him to understand the accepted principles which underlie cost and

production, profit and loss, supply and demand. Ignorance is the most unprofitable of commodities. Assumption of superior wisdom brings, in the long run, no larger percentage. So both parties to this grave issue may easily learn and unlearn, to their own and the community's positive advantage. Great Britain, as the country in which these questions are most fiercely contested, does well by introducing into her new educational system the study of the elementary economies. The subject was recently laid before the privy council by a committee of the Social Science Association. The case was stated by them in the following memorial:

(1.) "Your memorialists have a strong conviction that the hostility between labor and capital, arising from an erroneous belief that the interests of working-people and their employers, and of tenants and landlords, are opposed to each other, a belief leading, in manufacturers, to attempts to impose harassing restrictions regarding rates of wages, hours of labor, piece-work, number of apprentices, and the use of machinery; and in agriculture, to attempts to dictate the amount of rent to be exacted, and the selection of tenants, and leading, in its further stages, to strikes, lock-outs, "rattings," and threats of personal violence, and ultimately, in many cases, to murder itself, might have been mitigated, and, in great measure, prevented, had the people of this country in their youth, and before the mind could be warped, been instructed in the elements of economic science. And on this, and on other grounds, they respectfully urge that no more time be lost in taking measures for gradually introducing this knowledge, as a regular branch of education, into all schools to which the state gives pecuniary aid.

(2.) "The practicability of communicating such knowledge to the minds of even very young persons, and of making it both interesting and attractive, has been demonstrated on such a scale as to place the matter beyond doubt.

(3.) "Your memorialists respectfully suggest, as one practical mode of proceeding, that elementary economic science be added to the subjects in which persons intending to become teachers are invited to qualify themselves for examination, under the supervision of the department of practical science and art, and in which they may afterward prepare pupils for examination, with a view to payment for ascertained success; and further, they venture to submit that, until all difficulties incident to the establishment of this new branch of instruction shall have been surmounted, it would be highly expedient to appoint at least one well-qualified school-inspector, of known zeal in the cause, to superintend the operations on this particular subject."

In response, the vice-president of the council, Mr. Forster, while not agreeing with the request for the appointment of a special school-inspector, suggested that the committee obtain a voluntary exercise of such functions by some one or more of the present officials. This was carried out, and the pupils of four large schools at Manchester, under gov-

ernment supervision, now receive such instruction. During the ensuing year the study will be made quite general. The practice of teaching such elementary economics has been long carried on in what are known as the Birkbeck schools, a system springing from the mechanics' institute, and named after its founder. In some of the Glasgow schools, this study is a prominent branch. Professorships of political and commercial economy and of mercantile law are being established at the several British universities. It is strange that in countries like Great Britain and our own, (especially in such States as Massachusetts and Pennsylvania, and others, wherein are found the great organized industries,) there should not be a more extended and careful study of these questions. It is true, of course, that, through the discussions constantly had in our widely-circulated press, there is a large average of intelligent understanding of them among all classes of our population; yet it must be borne in mind, also, that much of this newspaper discussion is inconsequential and illogical, often veiling ignorance under sounding rhetoric or the rant of a partisan. Simple presentation of elementary principles, logically stated and aptly illustrated, would prepare the mind of the future employer or employé to fitly comprehend and rationally deal with the complex issues that grow out of such relations. The progress of free principles is only assured and steady when the general intelligence is equal to the demands made on it. Those demands are now more exacting than ever. They lay a strong hand on every individual member of the body-politic. It is a law as certain as gravitation, that we insure peace and order to a community just in the degree that its *average* mass, not its exceptional men and women, are made more useful, become more readily equipped with those tools by which opportunity carves success. The culminating harvests are but the results of fallow field, upturned earth, dropping seed, and the long train of natural processes and human care which ends in the ripening fruit and bending sheaves. Preparation is the true secret of the scholar. We must, as a nation, as Union and as States, be ready to enlarge the area of our preparation; be willing to be taught by others, nor fail in any wise to comprehend what the new duties are that new occasions and new surroundings may demand.

WORKING-CLASS EDUCATION IN EUROPE.

That we may find ourselves lagging, the points already suggested with regard to Massachusetts sufficiently prove. Contrast them with the testimony of Mr. Arthur J. Mundella, M. P. for Sheffield, who is one of the largest employers of labor in the manufacture of hosiery and woolen goods, as to the relative intelligence of Saxon and English operatives. The extract given is from his evidence before a royal commission of inquiry into this subject:

"The contrast between the work-people of Saxony and England engaged in the same trade is most humiliating; I have had statistics taken

of work-shops and rooms in factories in this district, and the frightful ignorance they reveal is disheartening and appalling. In Saxony, our manager, an Englishman of superior intelligence, has never met, in seven years, with a workman who cannot read and write—not in the limited and imperfect manner in which the majority of English artisans read and write, but with a freedom and familiarity which enable them to enjoy reading, and to conduct their correspondence in a creditable and often superior style. I am of opinion that the English workman is gradually losing the race, through the superior intelligence which foreign governments are carefully developing in their artisans. If we are to maintain our position in industrial competition, we must oppose to this national organization one equally effective and complete; if we continue the fight with our present voluntary system, we shall be defeated. Generations hence, we shall be struggling with ignorance, squalor, pauperism, and crime; but with a system of national education, made compulsory, and supplemented with art and industrial education, I believe, within twenty years, England would possess the most intelligent and inventive artisans in the world.”

When we read in official reports that in Massachusetts thousands of children are growing up in abject ignorance, working double the hours the same class do in English factories, that the law is often evaded, and children reported as having attended school who have scarcely crossed the threshold thereof, we might not simply ask if industrial supremacy can be achieved, but whether the free institutions we have won and defended at such precious cost can be maintained? In allowing such education as Germany affords her poorest sons, the empire pledges itself, working better than it knew, to the future assumption of government by a secure and steadfast democracy. Its immediate gains are in present wealth. Dr. Lyon Playfair declared, in his report on the Paris Exposition of 1867, that the one cause of British decadence therein was “that France, Prussia, Austria, Belgium, and Switzerland possess good systems of industrial education for the masters and managers of manufactories and workshops, and England possesses none.” More than that, even, is the fact that the boys and girls of the countries named are trained to skilled labor from childhood. They are systematically taught to be useful. There is a fair attempt made, chiefly as an investment on the part of the controlling classes, to impart what Mr. Scott Russell, the well-known engineer, says is meant by “technical education;” “not that general education which we all ought to have, and which helps to make us intelligent, able, good men, but that special education in our calling which should fit and enable each of us to discharge in the best manner the special narrow round of duty by which each citizen fills his own personal place in social life.” The establishment of a system of technical training such as this requires, Sir John Pakington well declared, speaking for England, in his presidential address to the Social Science Congress, “could not pos-

sibly be accomplished by the people. With all the aid that we might derive from the precedents of Holland, Berlin, Stuttgart, Austria, Hanover, Carlsruhe, and Zurich, the task is one which would now, in England, require all the energy and power of an able minister, supported by a consenting Parliament." If we, too, are to succeed in any attempt at technical training adequate to our wants, we must rely on instrumentalities more diffused and potential than the few, however admirable, institutions like the school at Worcester, the Technological Institute at Boston, the Cooper Union in New York, and the small schools of art and design at Philadelphia, Pittsburgh, and a few other cities. Such technical education as will be at all commensurate with our needs must be inwrought with our public-school system, beginning through object-instruction at the primary and proceeding through the secondary schools, until the scholar reaches that stage of development wherein, his or her special aptitude being understood, instruction may be continued in branches directly applicable to the chosen pursuit. As is said of the canton Zurich, Switzerland, we ought to be able to say that our "whole system is most scientifically constructed from beginning to end; and it is as practically adapted to all the wants of an industrial community as it is scientific in its plan." How completely provided for is this Swiss community may be realized from the fact that, among other advantages, it has supplementary or repetition schools, in which apprentices and youth over fifteen, who work in shop, mill, or yard, attend one day or two half-days per week, in order to freshen their studies and acquire new ones. Therein "they have every facility for obtaining technical instruction suited to their respective trades and occupations." The teachers are carefully trained at special seminaries. The simplest object-lessons are all prepared for this purpose—the training of the hand and eye as well as the brain. In the Zurich school-houses may be found during the hours of attendance all the children of the canton. In Lausanne, a teacher was puzzled to reply to the question of an English tourist, who asked what steps were taken if parents failed to send their children. He said, at last, such a thing never occurred there. The consequence is that, as in Germany, all are educated to a considerable degree, and are especially trained to practical life. We, however, seem to depend for our future progress upon the favorable conditions we have created in the past. In the more advanced countries of Europe there appears everywhere manifest an earnest effort to create new and more favorable conditions in which to insure that progress will be secure and steady. It is evident we must not depend too much upon our favorable past or our fortunate present. Both as a matter of profit and development, from the material and moral plane alike, the question of a more complete practical and individual education, welded into and forming a vital part of our public-school system, is one of growing importance.

ELEVATING INFLUENCES.

Probably nothing that could be done to make mechanical pursuits and artisan life thoroughly honorable, in the usual social sense, could have more effect than a comprehensive effort at technical education would produce. To this good end, organizations of labor, often such powerful agencies for good or ill, might do much. If they required, themselves arranging some fair test, that no man should become a member of any trades-union unless he established to the satisfaction of his working peers that he was so reasonably proficient in his trade as to be able anywhere to give honest work for honest pay, the whole standard of work at once would be elevated. If a man answered such a test, it would not matter where he, or how he, obtained his technical skill. It is gratifying to find educational activity among such organizations. Education, they insist upon, is the one stand-point on which to rest their Archimedian lever. Naturally enough, labor, when organized for its own protection and advancement, aspires mostly to the attainment of that skill or science of administration the knowledge of which is at the present moment the great secret of wealth making and possessing. For success, the community must come armed with the knowledge really necessary to the achieving of such administrative skill. Hence the necessity of public practical technical education.

WANT OF OUR PRESENT SYSTEM, AND VALUE OF WHAT IS PROPOSED.

Herbert Spencer, discussing what knowledge is most worth, declares that an acquaintance with science, in some of its departments, is of fundamental importance. What "is called 'learning a business,' really implies learning the science involved in it." Again, he says, "Just as fast as productive processes become more scientific, which competition will inevitably make them do, and just as fast as joint-stock undertakings spread, which they certainly will, so fast will scientific knowledge grow necessary to every one." In the full realization of that statement lies the solution of the so-called labor question. Ignorance will make working men and women the mere cogs and wheels in the great machinery of organized industry. Education, practical and technical, will make them its masters. A lively appreciation of this may be perceivable in the several replies of workingmen, in response to the inquiries of the Commissioner of Education, which may be found in a preceding portion of this circular.

The inquiry begun last year might have been carried further with great advantage. Though a little scouted by some to whom the circulars were addressed, it is a noticeable fact that, from the first, the workingmen discerned the purpose, and have responded quite fully. Their replies are very interesting; while equally as valuable are those sent by the observers, to whom inquiries were addressed. Not one fails, in these divisions, to see the advantages, pecuniary and otherwise, which more

definite, practical, and scientific institutions would be to individuals and the community.

Herbert Spencer's criticism on the inefficiency of the present system is amply sustained by this concurring testimony, drawn, as it is, from so many diverse sources. There is no more forcible statement of the failure of our common schools to teach that which we find most nearly concerns the business of life than the remarks of Herbert Spencer, already referred to. The quotation fitly closes and enforces this argument: "All our industries would cease were it not for all that information which men begin to acquire as they best may after their education is said to be finished. And were it not for this information, that has been from age to age accumulated and spread by unofficial means, these industries would never have existed. Had there been no teaching but such as is given in our public schools, England would now be what it was in feudal times. That increasing acquaintance with the laws of phenomena, which has, through successive ages, enabled us to subjugate nature to our needs, and in these days gives the common-laborer comforts which a few centuries ago kings could not purchase, is scarcely in any degree owed to the appointed means of instructing our youth. *The vital knowledge—that by which we have grown as a nation to what we are, and which now underlies our whole existence—is a knowledge that has got itself taught in nooks and corners; while the ordained agencies for teaching have been mumbling little else but dead formulas.*"

RICHARD J. HINTON.

EXTRACTS
FROM
THE SECOND ANNUAL REPORT
OF THE
BUREAU OF STATISTICS OF LABOR OF MASSACHUSETTS,
FOR
THE YEAR ENDING MARCH 1, 1871.

EXTRACTS FROM THE SECOND ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR OF MASSACHUSETTS, FOR THE YEAR ENDING MARCH 1, 1871.

EDUCATION IN RELATION TO STRIKES.

The best educated workmen, and those for whom means of intellectual improvement are provided by their employers, are the least likely to be engaged in strikes. "The further you recede from a condition wherein educational culture and refinement have generated a rigid self-control, which keeps all passionate outburst under check, the nearer you approach to its opposite—a condition of ignorance, coarseness, and even barbarism, the pitiable subjects of which know but one means of rectifying wrong, and that means is sudden and effective violence." In England, where strikes are more frequent and violent than in any other part of the world, the masses of the working-people are, as John Forster, one of England's leading authors, declares, "the worst educated people of any nation in Europe." "From the reports of the parliamentary commission upon the subject of trades-unions, we learn that those trades from which personal violence emanated were the very lowest in education—almost brutes in their ignorance." "With such a class of men, brute-force is the natural and only method of redress for real or supposed injury." "This propensity to violence, only education can control and overcome." "English writers speak of the 'dangerous classes' of England. Would there have been such classes had England been faithful to the duty it owed to all its classes, of educating all? Are there any such classes among the school-taught workmen of Massachusetts? And has not the school-house made them to differ?" "Education will secure better thoughts and wiser remedies. The school-house is better than the jail; prevention is wiser than cure. Had England encouraged and aided, by appropriate legislation, the educational and material advance of its industrial classes, neither trades-unions nor strikes had been the necessities of the workman," (pp. 28-31.)

In this country strikes have occurred principally in places where there are "no free lectures for the working-people, no libraries or places of instruction or amusement, nor anything having any reference to the moral and intellectual growth of the operatives," (pp. 62, 461, 464.) The testimony of an operative is: "*I know* that when there is any trouble between employer and employé, it is not the most intelligent men among the workmen who agitate and foment trouble," (p. 608.)

EDUCATIONAL PROGRESS AS AFFECTED BY REDUCTION IN HOURS OF LABOR.

"The effects of the long-time system were seen in a general disinclination for mental improvement," (p. 586.)

"When a working population is engrossed by material pursuits for thirteen or fourteen hours a day, the attempted devotion of a brief interval of exhausted effort to intellectual improvement is a superficial farce," (p. 578.) "Reduced hours of labor have a tendency to improve one mentally and physically. A person will, under continual long hours, become a mere brute, not having time to think or do anything for personal improvement," (p. 591.) "Many hard-working day-laborers have strong desires for intellectual improvement, but not being favorably situated as to hours, they are obliged to deny themselves the coveted luxury. Time to educate the mind is one of the greatest requirements of the laborer at the present day," (p. 619.)

Where the hours of labor have been reduced, it has been fully proved that "*opportunities given are opportunities improved,*" (p. 566.)

"Eight-hour workmen lose little time, improve their minds by reading and study, and are more disposed to investigate and think for themselves. They attend lectures, where men employed a longer time prefer lighter amusements, being too tired for mental application," (p. 594.)

"Lessened time has enlarged the area and the usefulness of the lyceums, and added very much to the numbers attending them; older lecturers assuring us that this increase is mainly derived from the working-classes," (p. 566.)

"After the adoption of the ten-hour system, (in England,) it was surprising to notice how drunkenness diminished, and to see mechanics' institutes, reading-rooms, libraries, debating societies, and evening-schools springing up," (p. 584.) "In England now, on the present system of short hours, they have mechanics' institutes in almost every town. Members pay one shilling (24 cents) a month. They are open every night. There are regular classes, and there are libraries," (p. 480.)

"It is the glory of the ten-hour men of Lancashire, England, that, though sorely tried by actual suffering, their higher culture and their nobler aims, generated by lessened time, gave them a better comprehension of the question, and enabled them to prevent their government from positive intervention in favor of secession and against the Government of the United States," (p. 566.)

SCHOOLING OF FACTORY-CHILDREN.

"As to legal schooling for children, there is considerable diversity of fact and statement. Many large manufacturers admit its non-enforcement, but charge the delinquency mainly to the parents." One manufacturer says: "Don't know that *any now have their legal schooling.*" Another: "Our children are much interested in their schooling, but *don't*

get the legal amount," (p. 266.) Another reports: "The children have about fourteen weeks' schooling per year. Most of the factory-parents take an interest in the matter. A few do not; they wish the children to work as much as possible," (p. 291.) The want of interest on the part of the parents is reported from places where wages are small, and the children's earnings are absolutely needed.

"Returns from 73 woolen-mills in Massachusetts give a total of 464 children, of whom but 180 are reported to have been sent out to school," (p. 488.) From the town of Holyoke: "There is great neglect of the school and employment laws concerning children in this place, and the results are bad," (p. 319.) From Southbridge: "So far as the schooling of the children is concerned, when notice was sent by the school-committee, as many as could be spared were sent out of the mills, but nothing was done to see that they really went to school. *It would not do for an overseer of the company to interfere in the matter further than directed by the agent, if he would retain his place,*" (p. 468.) From Fall River: "The school-law is obeyed, but *not the ten-hour law*, for children between ten and fifteen years old," (p. 467.) The question arises, whether children who work ten hours daily are in condition to derive much benefit from school.

A workman testifies: "In my room boys are employed between ten and fifteen. Little attention is paid to the school-law. When the term begins they are turned out, but most of them are back again in a fortnight," (p. 603.) Most is done for the education of factory-children where manufacturers themselves take a personal interest in the matter. "Some factory communities form a school-district by themselves. Three places have prosperous and well-managed factory-schools," (p. 266.) One manufacturer reports: "Have a school at the mill, half the expenses of which are paid by the town and half by us. Half the children attend it alternately," (p. 318.) Uono'tuck silk factory: "Children are employed, but their schooling is carefully looked after. No new child is hired unless it has had the legal amount of schooling, and at the beginning of every term the factories are inspected, and delinquents brought up to the mark. *Good results have always followed care in this respect.* The company have erected a brick school-house for the factory, at a cost of \$35,000, and provided it with all necessary facilities. Free library and reading-room for operatives," (p. 338.)

IMPROVEMENT UPON THE PRESENT SCHOOL-LAW—HALF-TIME SCHOOLS.

"As a purely educational matter, it would seem to be a function of the educational authorities of the State, and of the several local school-committees, to see that children in factories receive their regular schooling. But an objection to this is that local school-boards in manufacturing centers are not superior to the influence of strong corporations or powerful individual manufacturers, and that where they should

attempt to enforce the statute, they would stand a chance of being displaced at the next election. In some instances, as is credibly reported, *overseers of the very mills that violate the law are placed upon school-committees for the very purpose of making things go easy.* We give up the present statute as wholly useless, and recommend in its place the English system of 'half-time schools,' under which factory-children attend school three hours each day," (p. 489.)

"Something efficient must be done, and done quickly, for ignorance in the manufacturing towns is on the rampant increase. We venture to assert that never till within these last few years could it be said that *in a single establishment of about 1,600 working-people in Massachusetts, more than 800 could neither read nor write.* Our large cities and manufacturing centers are surcharged with children growing up in ignorance and to a heritage of crime, notwithstanding all our appliances of education. And one strong reason is that there is no enforcement of the school-laws. The ratio of ignorance is increasing beyond the proportion of its means of cure," (p. 490.)

"It is useless any longer to blink the idea of compulsory education out of sight and out of thought. A fearful warning comes from France, whose ignorant troops have been scattered like chaff before the educated soldiers of Prussia, and Prussia *compels* the education of every child. In France, in 1866, of a population of thirty-three millions, 28 per cent. of the men and 48 per cent. of the women could not read, while 40 per cent. of the men and 60 per cent. of the women could not write," (p. 492.)

"A successful experiment has been made with a half-time school at the Indian Orchard Mills, Springfield. It is one of the public schools of the city, under supervision of its school-committee, but is especially set apart for the factory-children. It was started in December, 1868, and was kept up until the winter of 1870, with an average attendance of 30 scholars, holding a session of three hours every afternoon. This system reaches a class of children which otherwise must remain in total ignorance. The effect upon them is marvellous, as regards morals and habits of neatness, and as a rule they learn as much as children of the same age in full-time school," (pp. 494-496.)

The same has been tried at the Naumkeag Mills, Salem, and the testimony is that "the effect of school-training upon the children is to make them more lively at their work and more tractable," (p. 638.)

With regard to the English half-time schools, the following points have been established by the concurrent testimony of all the school-masters and other witnesses examined. The testimony was taken for the education commission, pursuant to an order in Parliament of June 25, 1861.

1. "That a master can completely exhaust the children's capacity of attention in three hours, even with intervals of repose."
2. "That, where the teaching is anything like equal, a manual and

industrial occupation gives great advantage to the child in the acquirement of knowledge," "owing to better habits of attention," (p. 629.)

3. "That the half-time system has given to the children of these districts an education which they would not have obtained if long school-hours had been required."

4. "That the half-time system might be introduced with very great advantage into other trades and occupations."

5. "That a competent and trained master can teach a large number much more effectively than a small number;" *i. e.*, meaning with the organization of assistants, pupil-teachers, &c., (pp. 637, 638.)

One teacher testifies: "When I have had to select pupil-teachers, full three-fourths have been taken from the half-timers." (p. 628.) English system of half-time schools, (p. 497.) Testimony with regard to half-time schools, (pp. 622-638.)

EDUCATIONAL PROGRESS AS AFFECTED BY AGRICULTURAL PURSUITS.

Among the great evils of an agricultural life is the very limited time allowed for personal culture. "It was left for our enlightened nineteenth century and our enlightened country to discover and give currency to the great truth that ignorance is the mother of all good farming," (p. 167.)

"Old farmers exclaim against agricultural colleges, and join in the hue and cry against theoretical farming, against educating young men away from the farm, against giving them any education whatever," (p. 166.)

The general educational condition of the farm-laborer is *very low, even below that of the factory-operative*. A large percentage of them can neither read nor write. The educational condition of foreign farm-laborers is below that of natives, but their children are being better educated in our schools, some of the best pupils being Irish," (p. 161.)

"*Brains* as well as *bravcn* are needed by a farm-laborer to make him profitable help, and brains are the great need of New-England agriculture to-day," (p. 158.)

"It is a very rare thing to find an intelligent American employed as a hired farm-laborer; consequently the foreign element predominates, and the general tone of farming is decreasing," (p. 161.)

ELEVATING INFLUENCE OF EDUCATION UPON WORKINGMEN.

"The native working-classes of Massachusetts, educated to some fair extent, have within them a steadily-increasing desire for improvement and betterness." "Those who get so far above the abysmal depths of ignorance as to begin to see, to observe, and to think, are sure to begin to desire," (p. 535.)

"The educated American operative of the primary period of manu-

facturing has become extinct. A secondary period long ago succeeded it, furnishing a low grade of European operatives. These in turn, under the educational influence of our institutions, are undergoing a change, and getting to be thinkers and readers; and, demanding more time for improvement, are stepping up and out of this employment. Manufacturers 'do not see what they are to do for labor unless the Chinaman comes along,' and so we get into the tertiary formation by Mongolizing our factory-towns. This is practically saying that there must be, for the sake of cheapness, an eternal retrograde in the intellectual status of operatives. But it must not be forgotten that all this is at the expense of the growth of the older tenants of the country, and perhaps at the peril of institutions the security of which depends on the education of the people who really rule their country, and who, by education only, can be enabled to rule it well. The longer this education is retarded by the perpetual additional drag of new and ignorant masses, the worse it will be for the republic," (pp. 462, 463, 556.)

IGNORANCE OF WORKINGMEN NOT VOLUNTARY.

Abundant testimony proves that where native workmen are ignorant, it is from want of opportunity, not from choice. The means of improvement given, they would gladly avail themselves of it. One of their number says: "Concerts and minstrels are generally well attended. Still, I think any one understanding his subject, and having ample means for illustrating the natural sciences, would find it difficult to get a hall large enough to hold those who would go to hear him. The majority would patronize the latter entertainment in preference to the former," (p. 247.) Our native workmen are surely not inferior in intelligence to the English, and such lectures have met with great success among them. "Workmen seek common amusements only because refined, intellectual ones are beyond their means," (p. 486.) Many complain, "No places for instruction or innocent recreation within reach," (p. 583.) A very large majority of workmen, in all branches of trade, take newspapers and magazines, (pp. 583-612.)

RELATIVE EDUCATIONAL CONDITION OF NATIVE AND FOREIGN WORKMEN.

"The ratio of native to foreign, unable to read and write, is as 1 to 210; of the number unable to read and write to the whole, as 1 to 63. One of the large corporations in Lawrence reports that all born in the United States can read and write," (p. 265.)

"In 27 woolen-factories, 79 native and 348 foreign cannot read or write," (p. 296.)

"A brick company employs 170 persons, most of them French Canadians, 150 of whom cannot read or write," (p. 304.)

In contrast to this is the "Lynn organization of shoemakers, some

two thousand strong, and with only one member whose name has to be written for him," (p. 247.)

"Of 132 native workmen employed in a quarry, only 9 are unable to read and write, while out of 20 foreigners, 9 can neither read nor write," (p. 308.)

In a copper establishment, with 64 workmen, principally from Ireland and the British provinces, 30 are unable to read and write, (p. 369.)

Iron foundery employs 148 persons; all foreign but 8; unable to read and write, 100, (p. 371.)

Locomotives.—Native employés, 453; foreign, 470; unable to read or write, native, 11; foreign, 74, (p. 377.)

Lead company.—Thirty-four employés, one-half foreign; 13 cannot read or write, (p. 294.)

Newspaper manufactory.—Seventy-seven employés, mostly native; only 6 cannot read or write, (p. 315.) Eighty men employed; unable to read and write, 5 native, 15 foreign, (p. 372.)

Metal works.—Employed, 13,395 persons; proportion of native to foreign, as 54 to 53; unable to read and write, 886, (p. 389.)

Convict labor, as employed by the Tucker Manufacturing Company.—Number employed, 373; 80 native, 293 foreign; unable to read and write, 14 native and 29 foreign, (p. 398.)

The proportion of uneducated native labor seems to be larger in the State prison than in any department of trade.

"In factories a majority of the native-born employés, who can neither read nor write, are elderly women."

LETTER TO THE COMMISSIONER, BY LOUIS J. HINTON.

PRACTICAL VIEWS ON TECHNICAL EDUCATION.

TAKEN FROM THE ANNUAL REPORT OF THE COMMISSIONER FOR THE
YEAR 1871.

PRACTICAL VIEWS ON TECHNICAL EDUCATION.

The following letter, addressed to the Commissioner by a young English mechanic, resident in New York City, will be read with interest, as containing the expression of a practical, intelligent, and trained artisan, who has seen in Europe and the United States the advantages of that broader educational training for which he so strongly pleads, as a necessity alike to American labor and capital :

Hon. JOHN EATON, *Commissioner of Education* :

DEAR SIR: Since arriving in this country and mingling among its mechanics, I have anxiously sought to find out wherein consists the difference between the skilled workers of America and those of Europe. Puzzled at the outset, by noting in more than one case newly-arrived artisans, whom I knew to have been counted in the old home as first-class workmen, failing to satisfy those who first employed them here, I afterward saw the same men answer very well when they had adapted themselves to the American system of work. The inquiry will naturally be, What is the difference between the systems of English workmen and American? So far as my observation extends, I should say that in England, as a rule, the first condition of work is that it should be done well; the second, that it should be done quickly. *Here*, the first condition is, that it be done quickly, the quality being of secondary importance. Employers encourage the fast workman before the slower and better artisan—the man who takes pride in his work—by this course educating their employes to sacrifice everything for speed. That this is a system that will not answer in the future, however well it may have done in the past, is beginning to be shown by the ease first-class European workmen experience, when they come here and prove their skill, in getting employment at high wages in the many new trades springing up within our midst—trades that require skilled manipulation and previous training; while many native workmen have to be contented with the rougher work, not because they are not as clever, or in their natures as adaptable, as the skilled immigrant, for in fact they are more so, but because they *lack* just the higher technical training the new-comers have had. Let me draw an illustration from one of the trades I am best acquainted with—stone-cutting and carving.

Here in New York are to be found the fastest stone-cutters in the world; but are they the best? Hardly. Any one who has visited the Central Park must have viewed with delight the building known as “the terrace.” On it are found the finest specimens of ornate stone-cutting to be found

in the country. Were these cut by native workmen? With perhaps a few exceptions, the answer would be, "No." The beautiful carving was nearly all done by foreigners, who, if they had been trained here, would not have known how to cut anything outside the, to them, sing-song work of Corinthian leaves and capitals, the prescribed pattern that seems to be essential for the adornment (or disfigurement) of every house in the city (New York) that is built with a stone front to it. The workmen in the building trades afford a favorable and wide field for technical training. The carpenter, the plasterer, the stone-cutter, the bricklayer, or the painter, all work out, every day they toil, problems in geometry, mathematics, and mechanics, to say nothing of architectural construction, which, perhaps, may be claimed to be a result of the three previously mentioned sciences. Be that as it may, it is very desirable that the mechanics who cover this country with habitations and public buildings should know something of the higher branches of their callings, without that knowledge being required to become highly scientific. Besides the building trades, there are many more established in our midst, or rapidly forming, as the resources of the country develop and the people increase in wealth and education, and their new wants call them into being, in which technical instruction is, or will be, absolutely needful; for instance, to workers in textile fabrics, cabinet and furniture makers, machinists, engineers, workers in leather, in bronze, the precious metals, gas-fixtures, &c. Take as an example, the pottery trade. Is it not a disgrace to American manufacturers and workmen that European delf, china, and glass should supply so much of the demand for those household articles and ornaments? Surely there must be a clay here, if we had but the men who would know it when they saw it, convertible into good delf; and if there were but the same chances for instruction here as there now are in Europe, the man would be forthcoming who would not deem it beneath his powers to add to the beauty of even such common things as a cup or pitcher. There is really no good and substantial reason why American workmen should forever continue to imitate the patterns of European goods. Let them but have the same chances for instruction as their more favored rivals have had, and it will not be long before they add to the number of the few trades in which they have shown themselves to be the equals of the best workmen of any country.

A very simple trade, commencing at first from the ingenuity, skill, and energy of, perhaps, one man, will oftentimes spread until thousands find employment and a livelihood at it. This is well known. I simply allude to it that I may cite a case in point—that of the manufacturing of children's toys. We have but to visit any extensive warehouse to discover how large a proportion of these delights of children are imported. Why should this continue? It could be stopped if the action of other governments were copied. "Some of the best modeled toys in the world," says Cassel's Magazine, "come from Grünheinscher, in Saxony,

where their modeling is attended to in the most artistic manner." In Germany, the government educates its children in artistic construction. Hence the comparative cheapness with which we procure from that country those elegant toys that so delight Young America. The Germans are wise enough to use their best energies and talents in such simple trades as this, while dealing with the mightier, as of war and state-craft; and, *painstaking as they are in small and great things*, it is no wonder they reap success. That trades may be drawn away, through the want and neglect of technical training, was shown, somewhat to the chagrin of English manufacturers, by the contents of the last great Paris Industrial Exhibition. It was there seen that, in many branches of industry in which Englishmen had long been accustomed to consider their country unapproachable, they were equaled, if not surpassed, by German, French, and Belgian manufactures, and that, in many of the lighter businesses, requiring taste and high skill, they were "nowhere" beside their continental rivals. The change had been generally wrought within ten years. Naturally, they sought to learn the reason for this state of things, and found the chief to be that the French, German, and Belgian governments had striven, with great success, to give to their artisans such a thorough technical training that the artisans of those countries were able to put their individuality into their work; that is, highly-skilled workmen were able to turn out highly-finished work, so that when the buyers of the world wanted good articles, they knew they could get them of such or such a Parisian or Brussels firm. The revolution—for such the Paris Exposition proved to be—was not thrown away upon the English people. It was generally conceded, after a lengthy discussion, that, though the workmen of the past had been able to get along by sheer industry, for the future their powers must be added to; that, instead of a few men of an extensive trade being first-class, the whole trade must be lifted up to their plane. This could only be done by an improved system of technical education. What was found to be needful in England would prove of great use here; nay, the need for improvement is even greater here than there.

The question will be naturally asked, "What is meant by the term 'technical education for artisans'?" It is not always easy to find a definition for phrases in common use, generally understood in a vague way, but thoroughly comprehended only by a few experts. The writer thinks he will not be far wrong if he defines what is meant by the term in England, by illustration, as follows: A bricklayer should not only know how to lay a brick, but why he lays it—not so simple a thing as it may at first appear; that an engineer should be able to tell when his machine is safe, as well as be able to run it; that a cabinet-maker should know something about the principles of art, as well as to fit and screw pieces of wood together; that a miner should have some acquaintance with geology, and know more about mines than the simple fact of how to wield a pick in them; that he should be able to tell when a mine is

safe, and when it is not so, thus avoiding, if possible, repetitions of the Avondale disaster. Surely this is nearly, if not quite, practicable. Artisans' technical education would require that painters should know how to harmonize the colors they so prodigally spread upon our habitations and public edifices; that the dyer should know something of the properties of the chemicals used in his business beside their mere names, and so on through the list of the trades.

In France, Switzerland, and most of Germany, the education of artisans commences when they are boys at school. It is surprising how much can be taught to boys before they are sent out into the world to learn a trade, that will serve in making what they will be shown easy of comprehension to them. In England, in very many schools, they now teach free-hand drawing, once or twice a week, to the children attending them. Here I must record my earnest conviction that it is absolutely necessary to teach boys who have, in after-life, to get their livelihood by skilled labor, free-hand drawing; although it be but the simple rudiments of that art, to me it seems as necessary as that they should know how to write, it being as easy to teach one as the other. The very fact that nearly all can be taught to write, proves that they can also be taught how to draw, writing being really, after all, but a species of drawing. Then free-hand drawing is a splendid method of training the hand and eye into perceptions of size, order, and proportion. If boys are taught (and girls also) how to draw, even but a little, they become apt to learn many things pertaining to the business of their after-life that, without such knowledge, would be as a sealed book to them. Besides, what is of great importance, the time of journeyman and foreman, who have to teach the apprentice, is saved. This the writer has proved by personal experience. He would rather teach half a dozen boys how to cut and carve stone, if they had had even this slight preliminary training, that can be so easily imparted at the common-schools, than he would show one who did not know how to wield a pencil.

If we proceed to the journeyman, we shall find that, having some knowledge of free-hand drawing, architectural and mechanical draughting becomes easy of comprehension. The economizing of the time of employers and men holds good here; half their time and care would be saved if the men under them only had some technical knowledge, besides a saving in material oftentimes spoiled by the mistakes made through imperfectly-understood instructions, or ignorance of ought besides the simplest work.

The leaders of our industries would have less care, more time to study out the improvements, and find new fields for their energies. The boy who had had his mind prepared, his eye and hand trained, by even the simplest lessons of the common drawing-school, would, as a rule, be eager to learn more. It is just here that a system of good night or half-time schools would prove of great practical utility, coupled with some general system of schools of art, such as have been established

in England in connection with the South Kensington Museum, with branches established in every town of any importance, and having avenues open for the exceptionally talented pupils to travel upward toward the central school of art, where they might receive the very highest training that could be given them. Museums and galleries of industry and art are also of surpassing importance, as silent but patient instructors. America is shamefully behind in the matter of having public museums, considering the position she holds among the nations of the earth. It is only surprising that her people should have been able to do as well as they have done. Their success must be ascribed to that indomitable energy, characteristic of Americans, rather than to any aid given them by the national or State governments, in whose hands, by right, the power rests, if the will be there, to see that their people have every advantage afforded by other governments to their own people in the training that goes before all work. The writer devoutly hopes this letting alone an important need of the enrichers of the country will soon be changed. It must be seen that it is but poor economy to stop at only the frame-work, when paying for or preparing for the education of the people.

With facilities for instruction freely open to all, there will be no lack of eager pupils. This is shown by the success of the noble institution given to New York City by Peter Cooper, and by the results of the act of Mr. Whitworth, in England, in founding scholarships open to every workman who could win them by his abilities. The example of these two gentlemen is worthy of the earnest consideration of the swarming crop of millionaires America is producing. Enriched by labor, they cannot do a more graceful thing than to help labor to further help itself.

LOUIS J. HINTON.

OBSERVATIONS
UPON
THE CONDITION OF EDUCATION
IN THE
ANTHRACITE COAL DISTRICT OF PENNSYLVANIA.

A REPORT MADE TO THE UNITED STATES COMMISSIONER OF
EDUCATION, BY RICHARD J. HINTON.

THE ANTHRACITE COAL REGION OF PENNSYLVANIA—CONDITION OF EDUCATION—SOME ACCOUNT OF OBSERVATIONS THEREIN.

INTRODUCTORY.

The following partial analysis and statement of the educational condition of the anthracite mining population, based on two extended journeys through that portion of Pennsylvania, and on careful examination of other sources of information, have been prepared, at the request of the Commissioner of Education, and in accordance with his instructions.

The writer does not profess to be a practical educator, but only to bring to bear on this theme—the relation of education to labor—trained habits of observation, careful study, and a strong faith in the necessity of enlarging our common-school system, at least in many portions of the country, so as to make it more valuable in the direction of practical utility and industrial requirements. The investigations made in Pennsylvania, given in part in the following paper, have in view, not criticism of the schools or systems there existing, so much as to awaken attention to, and illustrate the need of, some enlargement of their sphere in the direction of elementary “technical” or industrial education.

During these journeys in the anthracite mining region, I was painfully struck with the average amount of ignorance and even indifference manifested, relative to the subject on which I was making inquiries. Most men who had any practical experience were ready to acknowledge that a large percentage of the waste in coal-mining, the loss of life, &c., among the working population, as well as of the remittent disorder and agitation, producing crime and perpetuating poverty, mainly resulted from the ignorance of the people among whom these evils existed. That they might be greatly reduced by education and a more careful training of the youth, was of course readily acknowledged. Few persons were found, however, who had any idea, beyond extending the existing district-school system, of the means by which ignorance should be eradicated and the condition of the miners improved. When asked, for instance, whether the danger now attending coal-mining, and the condition of the miners, would be in many respects greatly ameliorated at work and in their homes, if the miners were as a rule instructed in the simpler elements of that scientific knowledge which, to a thoughtful mind, seem so inevitable a necessity of such employment, there was of course an affirmative response, though in many cases accompanied by a look of surprise which was a sufficient proof that the idea had not been previously broached. In conversation with all who could by any possibility afford the desired information, the writer was able to learn of

but one attempt, mentioned hereafter, to impart in the common-schools accessible to miners' children, even the simplest elements of this technical knowledge. It is not meant to say that the teachers were incompetent for the task, but that, being as a rule mere followers of routine, there would be no opportunity, in the course of study usually laid down, for the majority of boys attending the district and other public schools, ever reaching the point at which some general knowledge on these subjects would begin to be imparted to them. The school-attendance of miners' children, especially of the boys, is somewhat fragmentary, and generally ceases at the age of ten or twelve years. Hence it follows that, in the system usually pursued, the studies which would let into the inquiring mind some information of the kind under consideration are not reached. According to my observations, even if they were, the method of presentation would in all probability be so dry and formal, so unidentified by any statement or observation with the facts and objects in which these pupils would be most directly interested, that they would not derive a great deal of benefit from the study. It seems to be forgotten that transmitted traits, marked physical vigor, and, in general, the coarse surroundings, place this class of school population, often rude and turbulent to a degree, in a position chiefly to be reached *objectively*, and not *subjectively*, through the senses and by the aid of material events and surroundings. Intelligence is their great need, and the acquiring of that may be accelerated greatly by means not strictly within the usual range of pedagogic formulas.

SPECIAL FACTORS IN THE PROBLEM.

Besides the great value of the material interests connected with and belonging to the anthracite coal field—interests which involve not only the process of coal-mining, but a complicated system of transportation, and a steadily-increasing number of furnaces, forges, bloomeries, rolling-mills, machine-shops, and similar works for the manufacture of iron, created in the main by the proximity of the important minerals which it is their province to work into use and even beauty—there are special facts which make the educational problem one of very great importance. The two principal factors are—

1. That a large proportion of the working population is not only of foreign descent and birth, but that it is yearly recruited by fresh accessions from other countries.

2. That year by year it becomes more and more apparent that the direction of leading industrial operations, mining, manufacturing, and transportation, is being concentrated into fewer hands; that, in fact, the corporate direction is being substituted for the individual employer; that the capital employed in carrying forward the vast machinery is from the outside, being used as a matter of speculative investment by those who know little or nothing of the community and its needs; that, in fact, the employer is fast becoming a non-resident; that the smaller capitalist and employer, who lived among and was of the work-people, is being merged in the transient superintendent and non-resident investor.

It is hardly necessary to enter into a detailed statement of the facts on which the above conclusions are based. A simple reference to some important items in the sum will establish them.

The upper or Lackawanna coal-basin is, as to its miners, works, railroads to and from it, and even the coal-lands yet unworked, virtually under the control of three wealthy corporations: the Delaware and Lackawanna Railroad Company, the Delaware and Hudson Canal Company, and the Pennsylvania Coal Company. The lower or Schuylkill basin is almost entirely under the control of the Philadelphia and Reading Railroad, which, by direct ownership or by lease, manages every outlet to market but two, and they are but partial, and could not supply the needs of the region. This corporation has nearly or quite a thousand miles of railroad in this basin, besides the main line from which its name is derived. Besides controlling the transportation and the markets, it is known to be, under various names, a large owner of mines, and the possessor of vast tracts of coal-lands. In the middle basin, which includes a portion of Luzerne County and the entire counties of Lehigh and Carbon, there is not so large a degree of corporate control, but the leading operators, being many of them enormously rich, have been enabled in the main to control the railroads which carry their products to market.

These two points—a foreign working population, steadily increasing, and a steady decrease of resident capitalists and employers—must be borne in mind in considering the question of education in the anthracite coal-fields of Eastern Pennsylvania.

EXTENT OF FOREIGN-BORN POPULATION.

The anthracite region proper includes the counties of Carbon, Columbia, Dauphin, Lehigh, Luzerne, Northumberland, and Schuylkill, an area of 552 square miles, or 353,280 acres. It is calculated to have 29,630,187,333 tons of coal within that area, still unworked. The average annual product of anthracite is about 14,000,000 tons, of which about three-fifths is sent to other markets; the balance being consumed short of tide-water. The population of these seven counties is shown in the following table, which also gives the percentage, native and foreign-born, &c., taken from Table V of the census of 1870:

Counties.	Native-born.	Foreign-born.	Having one or both parents foreign.	Having foreign father.	Having foreign mother.	Having foreign father and mother.
Carbon	21,180	6,964	14,382	14,145	13,230	12,993
Columbia	26,613	12,153	4,807	4,674	4,252	4,119
Dauphin	56,033	916	12,467	12,225	1,759	1,580
Lehigh	50,610	6,183	11,431	11,325	10,240	10,135
Luzerne	196,115	54,640	101,445	96,944	96,450	94,924
Northumberland	31,119	4,325	8,783	8,503	7,560	7,480
Schuylkill	85,572	30,886	68,870	66,812	63,626	61,568
Total	377,212	106,070	212,175	204,632	197,287	192,804

The counties of Columbia, Dauphin, and Northumberland are only in part coal-mining districts; hence a smaller percentage of the population is foreign-born. A very large proportion of this foreign-born population, probably three-fifths, is Irish; while the remainder is made up of Welsh, Scotch, English, and German. The Irish are the most difficult to bring within the advantages of the district schools, (owing chiefly to sectarian influences,) while the other largest fraction, the Welsh, however, have a distinct literary culture and training, which they maintain with ambitious interest and spirit.

These statistics give not only a relative idea of the importance of the region whose educational condition is under review, but they also point out some important circumstances which go to show that the field is one in which not only the ordinary district-school system receives a severe test, but that the elements therein are such as to demand careful study and a speedy enlargement of its educational instrumentalities.

Republican government, dependent for its security and stability upon the intelligent will of the people, must not fail to heed facts which seem to indicate permanent changes in the character of communities. Modern industries, conducted and organized on such a vast scale as is found, for instance, in the coal-mining regions, involve conditions quite different from any that existed when the American Republic was founded. If we are to have, as seems certain, large communities composed almost entirely of those employed in special occupations, requiring the investment of large capital, and that, in the main, as a consequence, by those who are non-resident, it follows there can be no escape from the turmoil, agitation, and vices of similar and semi-ignorant communities in other lands, except, as a leading step, the establishment of so thorough a system of common-education as, while adapted to special needs, shall ennoble labor, and make its servants honorable and enlightened citizens.

SCHOOLS IN THE ANTHRACITE REGION.

These being the facts, it is well to proceed to an examination of the present system. The census of 1870 gives the following statistics with regard to the school accommodation, &c., in the three most important mining counties in the section under consideration:

Counties.	SCHOOLS.		TEACHERS.		PUPILS.		Total number of pupils.	Income.
	Kind.	Number.	Male.	Female.	Male.	Female.		
Carbon	Public	113	76	38	3,658	3,504	7,162	\$66,451
Luzerne	do	45	179	451	16,203	15,585	31,788	255,720
Schuylkill	do	395	251	157	16,917	14,791	31,708	228,400
		993	506	646	36,778	33,880	70,658	580,571
Carbon	Private							
Luzerne	do	5	19	3	523	223		12,809
Schuylkill	do	6	3	9	73	102		9,890
		11	22	12	596	324	920	22,609
Total		1,004	528	658	37,374	34,204	71,578	603,180

The school-population of these three counties cannot be less than two-fifths of the whole, which is stated at 305,327 persons. This will leave 122,130 persons to be provided with the means of education. The above table shows a total attendance at schools, public and private, of 71,978, leaving 50,152 youth of the proper age not receiving instruction. These figures do not show that the large numbers given have received no instruction, but they illustrate how partial that instruction is, and at how early an age large numbers have been withdrawn from school and set to work in the mine or workshop. According to the report of the State superintendent of common-schools for 1870, the entire six counties presented this exhibit of the average condition and attendance in the common-schools:

Counties.	Total number of schools.	Number of teachers.	Average pay—males.	Average pay—females.	Average months of school.	Cost of each scholar.	Area in sq. miles.	Total population in 1870.
Carbon	6,843	119	\$51 80	\$32 70	6.01	\$0 95	119	28,144
Columbia	5,703	207	39 11	27 49	5.00	73	176	28,766
Dauphin	9,612	259	36 46	32 70	6.54	90	233	60,740
Lehigh	9,412	248	45 67	35 62	6.44	90	249	56,796
Luzerne	23,998	639	51 89	32 03	7.22	81	516	160,755
Northumberland	7,867	206	40 33	30 50	5.35	82	192	41,444
Schuylkill	21,481	417	51 59	30 68	7.33	85	410	116,428
Total	84,916	2,095	(a)	(b)	(c)	(d)	1,895	493,073

(a) Average pay of male teachers, \$44 17.

(b) Average pay of female teachers, \$31 55.

(c) About six months.

(d) Average cost of scholar, 88 cents.

ILLITERACY AMONG THE MINERS.

The condition of education may be further illustrated by a comparative view of this with other parts of Pennsylvania. To do so an examination of the tables of illiteracy will be essential. Comparing them, and also those of population, it will be found that the six counties already named as embracing the anthracite region, contained in 1870 a population of 493,073 persons, while that of the entire State was 3,521,791, giving to the anthracite region proper nearly one-eighth of the whole.

As there are sixty-five counties in the State, and the more populous cities are outside of the region under consideration, the value of the comparison is greater than might at first be supposed. The proportion of illiteracy is exhibited in the following table:

Counties.	Cannot read, 10 years and over.	Cannot write, 10 years and over.	Total illiterates.	Total population.
Carbon	2,457	3,841	6,298	28,144
Columbia	1,209	2,028	3,237	28,766
Dauphin	2,431	3,555	5,986	60,740
Lehigh	621	2,354	2,975	56,796
Luzerne	17,233	23,485	40,708	160,755
Northumberland	1,839	4,168	6,007	41,444
Schuylkill	10,961	16,291	27,252	116,428
Total	36,741	55,742	92,483	493,073

Taking only those who cannot read, and the result is that in the anthracite region the proportion of totally illiterate is very nearly one in fourteen, or more than 7 per cent. The proportion of the partially illiterate, though the distinction between being able to read and not to write seems practically to be drawing a difference too fine for the average apprehension, is less than one in nine; while, taking both classes, it will be seen that they number one in every five and a half persons.

Now, the total average of illiteracy for the State is as follows: Total illiteracy, 222,351 persons; of which 190,838 are persons of adult age, while of those between ten and twenty-one years the total is 31,513. These numbers include both classes of illiterates, as tabulated above. They show conclusively how very large a percentage of ignorance is contained in the anthracite counties, the proportion being, as shown above, two-fifths of the whole—a fact which justifies selection of this region and population as a subject of examination and discussion in regard to the relations its special forms of industry bear toward education.

In a recent address delivered by Professor Huxley before an English mechanics' or literary institute, the following pregnant words were uttered: "Who can doubt that every man of high natural ability, who is both miserable and ignorant, is as great a danger to society as a rocket without a stick is to the people who fire it?" Is it, then, any wonder that in the region under review there should have been, and still remain, great disorders, heavy criminal returns, intemperance and improvidence, and a wasteful and reckless method of employment? No one who studies the character of the miners' movements in Pennsylvania can doubt that their ranks include men "of high natural ability," nor can any one fail to observe, that will go among them, inquire into their daily lives, learn their modes of thought, and the circumstances that influence them, that many of these men are "both miserable and ignorant." Before one can provide remedies, by legislation or the healthful influences of a more correct public sentiment, it is certain that we must begin by studying the several relations and surroundings of the people who are to be affected. It must be done in the spirit manifested by one of the State mining inspectors, who very aptly suggests that "wealth is found not so much in the veins of rich minerals that fill the earth as in the purple veins of our free citizens."

SOME CAUSES OF INEFFICIENCY.

It is evident from the foregoing that the common-schools of the anthracite region are not endowed too lavishly or conducted too liberally. The average pay of teachers, as well as the length of school-terms, sufficiently indicates the want of any general incentive for the employment therein of teachers with a high degree of capacity. This will strike any inquiring mind at once. All with whom I conversed on the subject indicated as great obstacles to a larger degree of educational progress these three things:

1. The meager pay of teachers.

2. Inability to secure, as a rule, careful and efficient boards of school-directors.

3. The failure of teachers and system to interest the pupils.

A very intelligent teacher, with whom I conversed in Summit Township, Carbon County, said that there was great difficulty in getting his pupils, boys especially, to go any further than the rudimentary studies, "the three R's," as reading, writing, and arithmetic are sometimes jocularly described; and in the latter study, the lessons are not usually pursued beyond the first three divisions. Parents of the mining class were, he said, far more anxious to get their boys at work, increasing the family income, than to have them decently educated. But he acknowledged the system was at fault. Children of this class were, as a rule, full of rude health, requiring to be chiefly interested in any subject through their senses, while the methods usually employed in the common-school made no special appeal to any of the objects in which such children would be most thoroughly interested. In considering this point, I made many inquiries among teachers, miners, school-directors, employers, editors of local papers, and others competent to express opinions, and all agreed that intelligent training might be more widely diffused, if the ordinary course pursued in the common-schools could be so varied as to present to the average pupils studies which would bear directly upon the pursuit to the following of which the great body of the boys are looking as an emancipation from irksome tasks.

NIGHT-SCHOOLS IN EXISTENCE—HALF-TIME SCHOOLS DEMANDED.

Besides this adaptation of study for practical life, there seems required, owing to the circumstances which affect this population, some considerable modification in the present hours and time, as well as in the arrangement of classes and lessons, so as to permit a more irregular attendance than is now the case. Boys seldom stay at the district-school till they are twelve years of age. If a boy is large and well-grown, he is employed "on the breaker" as a "picker," or in some other work outside of the mine, before he arrives at that age. The ventilation act forbids the employment of boys of less than twelve years of age. But it is probably true that the law is oftener violated than obeyed. About two-thirds of the miners' sons are employed in some capacity about the mines. In Luzerne County, about forty per cent. of those under fourteen years of age attending school are miners' children. After that age the proportion is decreased by at least three-fourths. There is probably a longer average attendance of this class in the county named than in others embraced within the scope of my observations. The reason for this is found somewhat in the large proportion of Welsh miners living there, but more in the fact that there are larger towns and villages in this county, affording better opportunities for schools, through concentration of means, &c., than is the case in any of the other five counties. The number of hours during which boys are employed—ten

hours is a legal day—incapacitates youth of from twelve to sixteen years of age from attendance on night-schools. But there is no systematic attempt to establish them. In Luzerne and Schuylkill Counties enterprising teachers and benevolently-inclined clergymen often open such schools in the larger villages and towns during the winter months. They are not usually regarded as a success. In the winter of 1870-'71 there were some fifteen of these schools open in Scranton and Hyde Park, and, perhaps, throughout the county of Luzerne there was one or two to every village. Four-fifths of the pupils are young men and boys employed in the mines during the day. I was told of one family in Hyde Park which had seven boys, from nine to eighteen years of age, attending night-school. The usual attendance at each school in such centers as that named is from thirty to forty. Of course these efforts do a large amount of good; but they do not reach the vast amount of illiteracy and untrained intelligence which remains. The muscular system of growing youth must not be strained too far by the toils of the day to allow of ready attention to study in the evening. For the younger boys so employed it would seem essential to adopt some system of half-time schools, like that proposed and carried out under the supervision of a few enlightened mill owners and agents in Massachusetts, or enforced in Great Britain by definite legislation and rigid supervision thereunder. The necessity or cupidity of parents, and the indifference of employers and managers, ought not, nay, must not, be allowed to interfere with the intelligent educational training of those who are to form so important an element in the governing body of the immediate future. The State must have something to say in this regard. It has duties higher than that of the constable. Its functions are preventive more than punitive, and it falls short of its whole duty when failing to perceive the necessity of that careful administration of all agencies, without undue interference with individual rights and liberty of action, which aids intelligent development of not only material wealth, but personal worth and social progress.

PRAISEWORTHY ACTION AND EFFORT.

A notable illustration of the educational deficiency existing in this region is found in the action of Hon. George Corry, of Luzerne County, a large coal-operator, who, during the summer of 1869, while a strike was in progress, at his own expense employed teachers, and opened the Hyde Park district-schools to the children of miners and mining-laborers. He did this for two months, during which 560 boys attended, four-fifths of whom, Mr. Corry stated to me, had not previously been going to school. They all showed themselves anxious to learn. He, in common with others, who became interested, was fully satisfied with the beneficial character of the movement, and expressed himself as very desirous of some re-arrangement of school terms and hours, such as might be found to practically conform with the necessities of the population.

At Pottsville, Schuylkill County, I found one school in operation, which seemed to have been organized (perhaps the sticklers for system would reverse that remark, and say disorganized) with a view of directly meeting the necessities of the laboring people among whom it is situated. The school is an ungraded one, attended chiefly by large boys, whose studies are not far advanced, and whose attendance is necessarily irregular. The superintendent, Mr. B. F. Patterson, has arranged the classes and studies, to a considerable extent, so as to allow for this irregularity. In the report for 1870, he says: "When a boy has been out working, and comes back, he is permitted to begin again where he left off; in this way the classes are more or less broken up." But the interest is kept up, and increased still further by the principal's effort to direct attention to practical studies, such as measurement of work—cellars, ditches, lumber, brick, stone—the nature of mining, the character of gases, &c. "Male teachers are wanted," says Mr. Patterson, "who are not only competent to compute work, but able to show how the work should be done." This seemed to be the only effort in the direction indicated as needed that I was able to hear of in the whole region. Certainly there is no section in which a definition of technical training recently made, of not only knowing how to do a thing, but why it is done—as, for instance, "that a miner should have some acquaintance with geology, and know more about mines than the simple fact of how to wield a pick in them"—can find a readier field for usefulness and illustration.

There are scores of ways in which this necessity might be enforced. The waste in mining, owing to ignorance, is enormous. The loss of life, through the same cause, and that recklessness which most always accompanies ignorance, will be found to be appalling. The amount which might be saved annually through the utilization of the product, by improved methods of handling, would alone be more than sufficient to pay for an entire remodeling of the school system.

PRACTICAL EDUCATION WILL PREVENT MINING ACCIDENTS.

During the visits referred to, in the anthracite coal-field, and, since then, in examination of documentary testimony, particular attention has been paid to the number and character of mining accidents, and as to the means by which many of them might be prevented. An English working-miner, writing in the *London Beehive* with regard to the proper means of promoting the welfare of his class, whom he pithily describes as being in the main "an ignorant, untutored, and reckless horde, possessing no knowledge, as a rule, of what is essential to prudent avoidance of their daily perils," declares that coal-miners, "as intelligent men, ought to know how the noxious gas is likely to be generated, the particular points of danger, and the remedies that ought to be swiftly applied." One of the most intelligent mine-inspectors, appointed under the Pennsylvania "ventilation of mines" act, writes

in his report that "a knowledge of the destructiveness of all those gases" (such as "fire-damp," carbureted hydrogen, "black-damp," and "white" or "stone damp,") "should be properly understood by persons employed in the mines, as well as by the mine-managers." It is from the want of such rudimentary scientific knowledge, so necessary to the daily and even hourly safety of the men engaged in this important industry, that the press of the mining regions, and the reports from the State inspectors, are made mournful with accounts of accidents and disasters that involve large losses of life. That there is something more to be regarded than the making of additional profits on investments will be perceived by an examination of the figures herewith given.

The data here given are mainly based on the reports made to the governor of Pennsylvania, by the nine inspectors appointed the year previous. These embody the chief facts accessible, though a few statistics are added, gathered from the newspapers, under circumstances which seem to authenticate them. The reports are quite full with regard to Schuylkill County, but a portion of them cover the counties of Carbon, Luzerne, and Lehigh, and are therefore necessarily incomplete. But, as far as they go, they will serve the intended purpose.

During the year 1870, the four counties of Schuylkill, Northumberland, Columbia, and Dauphin, comprising the southern anthracite basin, produced, from 202 working collieries, employing a force of more than 30,000 persons, 6,342,509 tons of coal. During the same year there were 112 persons killed in Schuylkill County alone; 252 were injured, while 72 persons were made widows, and 252 children were left orphans; making a total of 668 cases of suffering and distress. In Northumberland County, 61 killed and 34 injured are reported. In Dauphin County, 1 person killed and 4 injured are named; and in Columbia County, 2 persons were killed and 9 injured; making, in all, for the four counties named, a total of 116 persons killed and 299 maimed and injured. Inspectors' reports, in portions of Luzerne and Carbon Counties, for the same period, (1870,) show that in the middle district thereof there were 25 deaths and 43 injured, making a total of 68. The loss of life is as 1 to every 56,000 tons of coal mined, and of injuries, 1 to every 32,558 tons mined. In the southern district of the same counties, there were, during the last six months of the year, 8 deaths and 25 accidents.

It is worth while making some comparison of the number of hands employed, the number injured, and the amount of product in each case. For the four counties already named, in one of which (Schuylkill) the percentage of accidents seems to be greatest, it appears that one person is employed for every 422 tons of coal mined, while one person is killed for every 49,174 tons; for every 21,283 tons more, one person is maimed or otherwise injured, and for every 78,302 tons, one widow is made, while there is one orphan child left for every 22,651 tons

mined. The rate of deaths in Schuylkill is one to every 35,166 tons, while in Dauphin, where the amount of this product is relatively small, the rate is but one to every 611,817 tons. In the year 1870, in the Lehigh inspection district, the deaths were 7, or about one for each 285,000 tons mined. The frightful record of Schuylkill County is still further illustrated by an analysis of the causes of the fatal accidents. It appears that 42 deaths resulted from the fall of coal or rock, 5 from explosions of gas, 8 from misuse of powder or premature explosions, 5 from boiler-explosions, and 9 from the use of defective machinery. The average number of deaths from coal-mining accidents in Great Britain is reported as 1 for every 84,226 tons raised. This comparison is not favorable to our own mines. The total number of deaths in twelve of the largest districts in England, for the years 1866-'67-'68, is 3,885. The increase of safety has been for the five years ending 1869, over a corresponding number of years ending 1860, equal to 24 per cent.; due, in the main, to more careful inspection and increased intelligence, both as to supervision and labor. In the earlier period, the English average of deaths was as 1 to every 74,674 tons, and, in the later, it has been as 1 for every 92,621 tons mined.

George Stephenson once said that "the price of coal-mining is pitmen's lives," and the force of this fatal truth is often terribly demonstrated. I find a partial summary of the report of the Pennsylvania mine inspectors for 1871, presented in a prominent journal of the mining region. The death-record shows a total of 272 killed outright and 622 injured. The number of widows made by these fatal accidents was 220, while nearly 600 children were made orphans. Of these accidents the chief causes are about in the following proportion: One-third from the neglect of operators and owners to construct a second opening or shaft; another third were killed by explosions of gas, which might have been in the main averted, if, as the ventilation-act requires, an examination of the mine had been made by an experienced miner with a safety-lamp, before men were set to work therein. One-sixth lose their lives through sheer negligence in failing to look after the roofs, &c., before working and blasting, while the small balance was probably from unavoidable and unforeseen causes. These estimates, made on good practical authority, will serve to point out the advantages in the matter of safety to life alone, by increasing and rendering practical the education of the embryo miner. An intelligent workman will not only be careful of his own safety, by an almost automatic system of prudence, but will refuse to enter mines the owners and operators of which are well known to be indifferent to the safety of men employed. Mr. Eckley B. Cox, of Jeddo, Pennsylvania, an accepted authority in mining, engineering, and management, says that "It is only by raising the standard of education among the miners, *by instructing the boys*, and by *providing schools for master-miners*, that the number of these accidents can be diminished." He divides them into three classes: 1st, those arising from carelessness; 2d,

those resulting from indifference or ignorance, or both together, of the persons in charge; and, 3d, to such causes as cannot be reasonably fore seen. Mr. Coxe also makes the following suggestions:

"It is also important to provide schools for the education of working-miners, in which they could be fitted for the responsible post of 'mine boss,' as the over-man or master-miner is called in this country. The course of instruction should be so arranged that the miner could, while pursuing his studies, support himself by working in the mines. He would not, of course, be able to gain as much as those not attending the school, but he could earn enough to pay his expenses. For this reason the schools for master-miners should be located in the mining districts, where work could be obtained. The course of instruction should embrace the elements of geology, chemistry, and mechanics, with special instruction in mining and underground surveying. Such schools exist in many parts of Europe, and have been found to be eminently useful. Although I am not aware that the plan has ever been tried, I think that *much good could be done by introducing into the common-schools of the mining districts an elementary course of instruction upon the subjects of mining, with special reference to the health and safety of the miner. If such provisions for the instruction of all classes of persons employed about the mines were made, one of the greatest difficulties in framing and carrying out good legislation upon mining would be removed.*"

In the paper from which the above is quoted, the ideas embraced are still further elaborated. Mr. Coxe is strenuous on the point of requiring that the common-school should give instruction in what may be termed the hygiene of the mines—all matters relating to the personal safety of the miners and security in their occupation. Until some such plan as this is adopted and faithfully carried out, so as to train intelligent labor as well as competent direction, there can be no thorough execution of laws, however well devised and faithfully administered they may be.

IN CONCLUSION.

It would be easy to multiply facts to prove what this paper is intended to illustrate—the advantage to capital and labor and to society by the introduction and organization of an educational system which will be adapted to the great needs of modern and organized industrial life. We must look squarely in the face the fact that the advance of scientific knowledge, the increase of machinery, and the consequent necessity of aggregating labor and skill, as a matter of economy, under trained administration, produce different social and personal circumstances, and demand different educational conditions from those which were sufficient when employer and employed were usually neighbors, and the margins separating them were so dim and indistinct as to be seldom considered. The region from which the foregoing facts have been gathered illustrates these changes in a very striking manner. Still

more does the nature of its leading industry show what saving of materials, what security of life, limb, and society, what personal progress in intelligence and prosperity might readily and almost immediately be obtained by a speedy and thorough remodeling of the public-school system, so that, as to hours and sessions, it might be better adapted to the necessities of those who are to be benefited, and in studies be more calculated to enlist their interest and largely increase their intelligence and usefulness.

RICHARD J. HINTON.

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