

Dr. Jackson's Address before the American Institute.

As noticed last week we will proceed to quote some extracts from this very able address.

WHAT IS LEARNING?—COLLEGES.—I must ask your indulgence toward the few thoughts which I shall endeavor to bring for your consideration concerning the encouragement and cultivation of science in the United States.

I have chosen this subject because I deem it one of vital interest to all concerned in the practical arts: for science has been defined to be the "Handmaid of the Arts," and as such is most assuredly a maid of honor, for certainly there is no higher vocation than ministering to the wants of the arts, on which the comforts and refinements of civilized life depend, and without which civilization itself could have no existence. Science may claim still more—it may be considered as the very soul of arts, giving to them life and progressive power, creating new means of human advancement, multiplying arts, and re-acting again upon the mind of the discoverer and inventor, endowing him with still higher powers of discernment and application. The time has long since passed when the dignity of a science was reckoned by its uselessness and its inapplicability to the so called vulgar uses of life.

No longer is learning to be banished from the workshops and be shut up in cloistered cells or in colleges, there to be kept beyond the reach of the workmen of our land.

It is too late for the antiquated scholars to denounce the cultivation of science, or to expatiate on the superiority of a little knowledge of Latin and Greek, for the world now bears witness to the higher achievements of modern science; and instead of delving forever into the history and precedents of the past, Young America presses forward to her brilliant future, unmindful of the checks which conservatism in error would place in her way. A democracy of science must and will overcome all obstacles, and regard as mile-stones of the past many of our so called institutions of learning.

[Well said Dr. Jackson; the very vitality of our colleges now depends upon a reform in teaching the useful—science and art.]

BOOK LEARNING—IRON AND STEEL.—Let the unfounded prejudices against book-learning be driven from the minds of men by making books still more worthy of being read and studied. Let theory and practice join hands "now and forever in indissoluble union."

Are not the arts living illustrations of the principles of science? Is not the world a great book of wisdom, as yet but partially read? Is not the field of the farmer full of wonders but little known to him, for want of scientific light?

"Give me to see," should be the cry of every intelligent man.

The iron master naturally wishes to know the nature and properties of every kind of iron ore, how it was formed, where it was found, and all the geological facts connected with its history, as well as how to reduce the metal to its most marketable form at the least cost and most profit.

Though he may not be a manufacturer of steel is he not interested in knowing what it is and how it differs from soft iron? Is not every man who owns a penknife or a razor interested in knowing what those implements are made of, and on what their excellence depends?

Will it harm him to know how his fluxes and fuel operate, and in what the differences between hot and cold blast, anthracite, coke, and charcoal-made iron consist? Will not science aid him in attaining the desirable result of making iron as cheaply and as well on this side of the Atlantic as on the other?

Cannot we make as good cast-steel from our excellent American iron as is made from similar metals from Sweden and Russia by the people of England?

GOLD, SILVER, ZINC, COPPER.—Although we have learned to smelt lead advantageously, our workmen do not know how to extract the silver which it often contains in considerable proportions, and the profit of its extraction goes into the hands of European refiners.

So with respect to alloys of copper and silver; we abandon the business of extracting

the precious metal to Europeans, and have not a single cupelling furnace in the United States.

Only a few years since we were wholly dependent on England for copper; but now we produce about one-tenth of the quantity required in the United States, by working a few of our own mines, and by smelting ores brought from other parts of the world.—There is room for the extension of this business.

Gold we have in abundance on both shores of our continent; but unfortunately this delusive metal has led too many to ruin on account of their ignorance of the history of gold mining, and a want of scientific skill in operating. A knowledge of the fact that veins of the precious metals decrease in richness as they descend into the earth, would have saved thousands from plunging into erroneous speculations.

Baron Humboldt confidently predicted that the gold mines of California would prove of little economical value to the United States; and notwithstanding the \$50,000,000 worth of gold that our new territory pours into the lap of commerce every year, if I am not erroneously informed, more than double that amount is expended in obtaining it.

Metallic zinc has never yet been profitably distilled from the ores of this country, owing to the want of skill in the operatives; but we shall soon learn how to prosecute the art, and shall then bring our numerous rich zinc mines into action.

Already citizens of New York and New Jersey have made a beginning, and have succeeded in the manufacture of an innocuous white paint from the ores of the Sussex Mines, and will, ere long, render Le Claire's discovery economically valuable in the United States, and we see that this discovery will banish lead paralysis from the hand of the painter, and colic from his bowels.

[It appears to us that the Dr. is annoyed with rusty antiquated opinions. Is it an established fact that all veins of the precious metals decrease downwards in richness? It is not. It is not a fact that more money is expended in obtaining the California gold, than what can be had in return. We have been informed that metallic zinc is now profitably made in New Jersey. We were told this by the agent of the Zinc Company.]

TIN—WANT OF SCIENTIFIC MINING SKILL IN AMERICA.—Metallic tin is not produced in this country for want of the discovery of mines of its ores, only five small veins having thus far been discovered in the United States.

Turn the attention of our mineralogists and geologists to the metamorphic rocks, and let them search with practical views, and we shall doubtless soon know if we are to be wholly dependent upon England and the East Indies for this valuable metal.

Iron ores we have in abundance, and to America is due the honor of discovering the method of reducing them by means of anthracite hard coal.

The finer kinds of iron which are smelted by means of charcoal fuel from the best kinds of iron ore should not be confounded in our markets with the coarser varieties, but should be reserved, as in Europe, for particular purposes.

We have much to learn in the science and economy of the furnace before we can produce iron at sufficiently low cost to dispense with tariff laws. If half the time and money that is expended in political electioneering, had been devoted to the improvement of the art of the iron smelter, we should long since have produced this indispensable metal at a lower cost than it can be obtained from Europe.

Of the art of mining our people know but little; and notwithstanding the multitude of absurd speculations in the formation of stock companies for working mines, we have but very few successful operations in progress.

Few are aware that a mine must first be constructed before it can be advantageously wrought, and that a considerable amount of money must be expended in making the requisite preparations, before profitable returns can be expected, from even the richest mines. Hence, through want of knowledge, and unreasonable impatience, a good mine instead of be-

ing won, is lost, with all the capital expended in attempting to open it.

Thus far our successful mining has been the work of Cornish miners; and I regret to say that there are but few that have given profitable returns, owing to the want of scientific skill in scientific and economical management.

THE TELEGRAPH.—Chemistry and physics gave to the world the electric and electromagnetic telegraphs—those marvellous means of communication which enable us to use the lightning for our Mercury in transmitting intelligence quick as thought.

This product of science was the work of many heads and hands, and belongs to no one man, but to the scientific world. To Oersted, of Copenhagen, in Denmark, who first suggested it, to Jos. Henry, who improved the electro-magnet, and still more to Daniell and Grove, of London, who invented the sustaining galvanic battery, the chief credit is due; while to several others is to be credited the different modes of recording the signs by which numbers and letters are denoted.

At the suggestion of Arago, the talking wires of the electric telegraph are made to measure the longitudes of places inland, with greater accuracy than any astronomical measurements by lunar distances and occultations of stars, as formerly practiced with the aid of the sextant and chronometer only.

The recording electro-magnetic clocks of Bain, Wheatstone, Locke, and others, give precision to astronomical observations never known before, and divide the second of time into a hundred parts, measurable by the dividers upon a strip of paper.

It is by no means certain that there are not more worlds for science to conquer; and it is more desirable to march onward, than to stop to quarrel about the priority of discovery of those which have already been made. Time and the scientific historian, will do justice to all who have contributed in bringing about these valuable results, regardless of every unjust monopoly attempted by patent laws.

[We were anxious to know what Dr. Jackson thought of the telegraph, in other words, to have his opinion about who was the inventor of the telegraph; he has been spoken of as the inventor of it in preference to Mr. Morse. He never mentions the name of Morse.]

JUSTICE TO INVENTORS.—It requires no small amount of moral courage in a man of science to lay his discoveries before the world, and abide the storm of a abuse that issues to fall upon his head.

Gallileo, Harvey, Jenner, Scheele, and Davy all suffered persecutions severe in direct ratio to the importance of their discoveries; and the day is not yet come when persecutions for doing good will cease.

It is true of the great men I have just named, that the world ultimately did justice to their discoveries, though not during their lifetime. We now know that Watt discovered the composition of water; but it was not until 66 years after his death that the honor of this discovery was awarded to him by the instrumentality of the researches of Arago and Dumas, who were sent to England to learn all the particulars of his scientific career, for the purpose of preparing his eulogy for the Academy of Sciences of France.

Every attempt was made to rob our own Franklin of the honor of the discovery of the identity of lightning and electricity, and of that of discovering the means of protecting our ships and dwellings from the thunderbolt; but, in time, the award was made to him by the unanimous consent of the scientific world.

HOW JUSTICE CAN BE DONE TO INVENTORS—PATENTS, &c.—I need not say more of injustice done to scientific men. The subject is painful, and the facts are discreditable to our race. It is better that we should set about the work of preventing the repetition of them in our own land, and of rescuing mankind from the crimes brought on by selfish ambition, unprincipled avarice, and hateful envy.

How can this be accomplished?

First and chiefly, without doubt, in cultivating high morality in the community and a sense of justice toward their fellow men. Secondly, by requiring full and decisive proofs of a discovery before any man's claims to it shall be allowed. Third, by having recorded, in the archives of science and in permanent

institutions, the exact history of every important discovery, with the evidence of the facts alleged.

It should not be enough that a mere speculator in inventions, should go to a Patent Office and swear that he has made a discovery and invention, when he may have stolen it from some unsuspecting man of science, or from a more humble artisan.

No true man of science will ever disgrace himself by asking for a patent; and if he should, he might not know what to do with it any more than the man did who drew an elephant at a raffle. He cannot and will not leave his scientific pursuits to turn showman, mechanic, or merchant; and it is better for him and for the world that he should continue his favorite pursuits and bring out more from the unexplored depths of human ingenuity and skill.

What then shall be done? How can we protect the discoverer and inventor?

There was a discovery of a most curious and wonderful nature made in France a few years ago—one that astonished the world more, perhaps, than any that was ever made; one, too of universal importance, and very difficult to protect by letters patent.

It was the discovery of Photography, and of causing objects in nature to paint their own pictures by the sun.

This discovery was made by a Frenchman named Niepce, who on his death entrusted it to his son. It was then quite imperfect, though the principle was well established. Niepce communicated this discovery to Daguerre, a Parisian painter of dioramas, and it was arranged that they should perfect it by their joint labors, and since Daguerre promised to render it available to their interests, Niepce agreed that the art should bear Daguerre's name.

By the aid of chemistry this wonderful art was brought to such a degree of perfection as to be ready for publication. To Daguerre came the honor of first exhibiting this discovery to one of the most honorable members of the institute, M. Arago, the astronomer of France; and this savant offered to lay the discovery before the Academy of Sciences and to make it free to the public on certain terms. This was soon arranged, and the fact of making a picture by sunlight was instantly demonstrated to the Academy.

An award was then voted of 6,000 francs pension per annum, to Mr. Niepce during his life, and of 4,000 francs per annum to Daguerre for this discovery and invention, and forever after it was to be free to all men and all nations.

Thus the world became forever indebted to France for the most beautiful art that has surprised this wonder-loving age. Who, that has taken out letters patent for trifling improvements in this art, does not feel ashamed of himself when he contemplates this noble gift of the French nation? Gentlemen, I doubt not many of you have caught the idea which I have the honor to suggest for your consideration. If we would encourage the honest inventor and discoverer we should have some institutions as noble as the Academy of Sciences of France; and without abolishing the patent office we would leave to inventors and discoverers the choice between the two, and I doubt not most American inventors would prefer the Academy.

[Dr. Jackson pays but a wretched compliment to the great Watt, whom he extols in one sentence and calls him, along with all our patentees, "showman, mechanic, and merchant," for it is well known that he took out various patents and profited by them, and as a man of science he was certainly superior to the learned Doctor. What kind of a view has he of a what he calls a scientific man. Is not Dr. Hare, of Philadelphia, a scientific man? Yes he is, and stands high in the ranks, and is he a showman because he is a patentee. Is it a disgrace to be a mechanic and merchant, and exhibit a patent? No: we apprehend that Dr. Jackson did not fully consider these points; if he did he has a wrong idea of men and things. We might mention the names of quite a number of scientific men who have taken out patents—such as old Dr. Nott, of Schenectady; Dr. Page, of the Patent Office, &c.—to whom the remarks of Dr. Jackson do great injustice.]