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To Our Mechanics---"Come Let us Reason Together."

It is an undeniable fact, that the great majority of our mechanics are not reading men, that is, they do not read useful and instructive works. We do not mean to say that our mechanics cannot, and do not read at all, far from it, for there are but few among us who have not received the elements of a common education; but we do say that the majority do not make a practice of reading works which expand the intellect and improve the mind. The works which they make a practice of reading, tend to grossify and puddle the mind. This is one reason why there are so few among our mechanics capable of taking charge of and managing the business they have learned as trades. It is also a reason why so many of them are rough in speech, and uncourteous in manner. There are many, very many men in our country who were once journeymen mechanics, but who now occupy high and important positions in the republic. We rejoice at this, but we are not a little sorry to add that the majority of them had to leave their trades, and become lawyers,—they at least did not move out from the workshop direct to the House of Representatives, or the Senate Chamber. Fillmore, our President, and Douglass, Senator from Illinois, were once tradesmen, but they arose to their present positions, not through the tailor's or cloth-dresser's bench, but the lawyers bench. There is not a solitary individual in our country, who has, from a lowly, elevated himself to a high position in society, but has been and is a reading man,—one who has read and does read books that are books.

Those mechanics who rise to foremen and employers, are the reading men of the mass; they aspired to be something and adopted the best means to secure the desired ends. Worth and intelligence always command respect from those whose respect is worth striving for. We are not pleading for a gross struggle for wealth, although a reasonable amount of it—as a provision for sickness or old age, is a laudable and proper desire, but we plead first of all for an elevation of character as a means to a social elevation among men of *real worth*. Wealth without worth will never make a man pass among gentlemen, as a current coin, but the man who is industrious, intelligent, trusty, and courteous, will always pass for the genuine metal.

Industry, honesty, and intelligence are qualities of character more valuable than gold seven times purified. A talented, first rate handy mechanic, without such qualities will never rise, for he cannot be trusted. It is not the *smartest* man who is always selected to be a superintendant among his fellow workman; it is he who combines the greatest amount of abilities with those qualities which give his employers confidence in his *moral* worth. We have often been solicited to furnish competent mechanics to take charge of new establishments, and have found it very difficult to secure, at any time, the *proper man*; and no further back than last week a gentleman writing to us from the South, uses the following language: "Last summer, I visited the North and purchased machinery for the manufacture of chairs, and after considerable trouble hired a man alleged to be competent to superintend the whole business. I have not yet been able to commence operations, owing to the incompetency in every respect, of the man in whom I trusted to superintend my business; can you send me a man with the requisite qualifications, and above all let him be a gentleman?" We cannot send him the kind of man he wants and requires. Our real good men are scarce, —they soon find situations, and we believe there would be more good situations for men (manufacturing establishments would increase) if we had more men capable of filling them honorably and well.

We have now preached a sermon long enough for a week's calm reflection, and next week we will point out the way whereby young mechanics are sure to rise.

Prof. Page's Electro-Magnetic Locomotive.

The following we have noticed in a great number of papers as taken from the Washington Intelligencer, and communicated by Prof. Page. It details the last experiment made with his electro-magnetic locomotive at Washington. We have commented upon it briefly, this week, and may return to the subject next week.

"The locomotive, with the battery fully charged, weighs $10\frac{1}{2}$ tons. With the seven passengers taken on the trip to and from Bladensburg, the weight was 11 tons. Under the most favorable arrangements, *eight pounds* are required to start a ton on a perfectly level rail, and seven pounds will barely keep a ton in motion. Ordinarily, upon railroads, the allowance is ten pounds to a ton, but this applies only to cars unincumbered by machinery. The friction of locomotive machinery renders its draught far greater, and can only be accurately ascertained by experiment in each case.

The magnetic locomotive, the first of its kind ever made, is imperfect, and, from the newness and stiffness of all the work, it runs exceedingly hard. We will take 200 pounds, which is below the actual power required to keep it in motion on a level portion of the road. A horse-power, upon the usual estimate, is 150 pounds $2\frac{1}{2}$ miles an hour, or 375 pounds 1 mile an hour. The speed of the magnetic locomotive is, we will say, 15 miles an hour on a level road (it has in fact made more) and its traction 200 pounds. We have, then, 375 pounds 1 mile an hour for one horse, and 200 pounds 15 miles an hour for the locomotive, which gives *eight* horse power. But the engine has more than this. It has greater power at a slow speed, and must have, by all reasonable estimates, twelve horse power; which, as I said before, is about one half its proper capacity. One of the most serious defects arises from a want of insulation in the helices.

After the engine was placed on the road it was found necessary to throw out of action five of the helices, and these at the most important point in the stroke. This difficulty could not be remedied without taking both engines entirely out—an undertaking for which I had neither the time nor means, as the track with which we are now accommodated is soon to be filled up for the purposes of the Railroad Company. Another serious difficulty encountered, was the breaking of the porous cells in the battery, causing a mixture of the two acids, and the interception of a large portion of the power. I had great difficulty in procuring suitable porous cells, and the manufacture of such as I needed was, after great expense, given up by two of the best pottery establishments in the country as a thing impracticable.

It was, however, accomplished through the ingenuity of Mr. Ari Davis, my engineer, but they were made of weak clay, and have now, from frequent use, become so much impaired as to break from the slightest causes. Before we started, two of them broke, and the defect was only partially repaired. Not far from Bladensburg two more gave way, and detracted at once greatly from our working power. On our return, about two miles from Bladensburg, three more gave way, and we were reduced to at least one half of our power. The running time from Washington and Bladensburg was thirty-nine minutes. We were stopped on the way five times, or we should have probably made the run in less than thirty minutes. Going and coming there were seven stops and three delays—that is, the engines were backed three times, but without entirely losing headway. It is a very important and interesting feature of the engine, which I demonstrated some years since, that the reversing power is greater than the propelling power; it is nearly twice as great. When the engine is reversed, the magnetic electric induction is in favor of the battery current, and augments its effects. The defect of the cells is easily remedied. The trouble growing out of the oscillating motion of the car can all be obviated by using rotary instead of reciprocating engines. The greatest speed attained on our last trip was about nineteen miles an hour, and about seven more than in any former experiment."

In the foregoing description of Prof. Page's Electro-Magnetic Locomotive we have endeavored to discover what he means by "*eight* pounds are required to start a ton on a perfectly level rail." There is no mechanical power—laboring force—in mere dead weight. He says, "a horse-power is 150 pounds moving at $2\frac{1}{2}$ miles per hour," and the speed of his locomotive being 15 miles per hour its total weight 11 tons, gives it 8 horse-power, but he says it has more power when moving slow than fast, and its actual power is all of 24 horse.

It is very evident that the correct data for estimating the power of a locomotive, is not clearly understood—or rather, let us say, not clearly set forth in Prof. Page's communication. The power of a locomotive is not estimated by the old fashioned rule of a horse walking at the rate of $2\frac{1}{2}$ miles an hour and drawing 200 lbs. over a pulley, as estimated by Boulton and Watt. Upon a level railroad, a horse can draw 10 tons at the rate of 2 miles per hour, but as that eminent engineer, Pambour says, "it is an unintelligible fiction to pretend to assimilate locomotives to horses." The formula for calculating the power of a locomotive is $P=Wvp-f$, or $P=St-f$. The first formula is, P, the power, equal to W, the weight multiplied into v, the velocity of the pistons, into p the pressure of steam in square inches on them, less f, the friction of the parts of the engine. The second formula is P, the power, equal to the quantity of steam, S, raised in a given time; t, less f, the friction of parts. The power of an engine is in the steam, and the quantity that can be raised in a given time, is well known by the amount of the heating surface of the boiler. The proper rule for estimating the economic value of an engine, is its cost, and the number of tons it can draw at the quickest rate with the least amount of fuel, and for the longest time with the least repairs. If it is meant by the 8 lbs. mentioned above, "the pressure and velocity," then we must take into account that every ton moving at the velocity of 30 miles per hour, experiences an atmospheric resistance of 12 pounds. The power of locomotives is not yet fully understood, we mean as it relates to their weight, evaporating power, and the load they can draw in a given time. Some locomotives of 14 tons, are more effective than others of 18 tons. There is not a single locomotive engine builder in our country but could build an engine of 10 tons, and warrant it to run at the rate of 30 miles an hour on a level rail with a light train, say 20 tons, (we keep within reasonable bounds).

As far as we have been able to search back, this electro-magnetic locomotive is not the first that has been tried: in 1843 an electro-magnetic locomotive, weighing 5 tons, was tried by one Davidson, in Scotland, but it was a failure, and so was one by a Mr. Little, in England, which was tried a few years afterwards. We do not feel, like some, in reference to the appropriation made by Government for Prof. Page to make experiments in the application of electro-magnetism as a mechanical power; nor do we think one better qualified to make the experiments could have been selected. We like to see a prudent liberality in making appropriations for scientific purposes, and we should like to see more economy in some branches of the government, so that more money might be devoted to advance science and art. It is our opinion, however, that electro-magnetism is far inferior to steam power, and far more expensive. It has been stated that electro-magnetism would be more safe than steam, as there would no explosions. We apprehend, that as much danger might be anticipated from the acids and the gases of and for the batteries, as from explosions. A lump of coal is a more safe and convenient supporter of combustion than a carbuoy of sulphuric acid. It is the *combustion* (using the term for plainness) of the zinc in the battery which generates the electric force, just as the combustion of coal generates the steam force. Will the zinc give out more force than the coal required to smelt it? A most eminent chemist, Liebig, says no, and we believe he is right; but we have extended this article to an undue length, and will not enter at present into details of the comparison of steam and electro-magnetic economy.

Notices of Books.

The Stones of Venice: By Ruskin; published by John Wiley: Broadway, New York. —This is a valuable volume by the author of "The Seven Lamps of Architecture." It treats of the buildings of Venice—their history, style, decorations, and construction. Any work on art by Mr. Ruskin is of high value both to the artist and the thinker; and in this work, originality, a love of truth, with liberty of speech, are impressed on every line. He details the rise and fall of the once celebrated "City of the Sea," and writes her history in her stones. The illustrations are numerous and "have tongues." As a critic of works of art, Ruskin stands high. He is not squeamish about fine words, but uses those which tell the truth in the clearest manner.

Episodes of Insect Life.—This is a beautiful volume, published by J. S. Redfield, Clinton Hall, this city. It is illustrated with some of the most quaint and beautiful figures that we have ever seen. The object of the author is to render the study of Entomology—the science of insects—more popular and attractive to the generality of mankind; and well has the *incog.* author, who styles himself "*Acheti Domestica*," accomplished the object intended. We have never read a more attractive and instructive book. Those who have neither the time nor the patience to study this subject fully, but who have a desire to know something about it, should get this book; and even those who believe themselves well versed in it, will find much that is new and everything to delight.

The Turner's Companion: Henry Carey Baird, of Philadelphia, successor to E. L. Carey.—This book treats of concentric, elliptic, and eccentric turning, with directions for using the eccentric cutter, drill, vertical cutter, and circular rest, with patterns and instructions for using them. The first thing described is the lathe, by which we learn that this machine was known to the ancient Greeks and Romans, and was used by them in turning urns and vases, and adorning them with ornaments in basso relievo. It is illustrated with a great number of engravings, such as tools and works of art, and it explains how the machinery is used, and how the works are produced. It does not treat of power-turning, such as Blanchard's lathe, but it contains a great deal that is exceedingly interesting, forming a very useful book, which should be found in every mechanics' library.

Fruit, Flower, and Kitchen Garden: Published by Henry C. Baird, Philadelphia — This is a republication of the work of Neil, who was thirty years Secretary of the "Caledonian Horticultural Society." Although the work relates principally to the science of horticulture as practiced in Scotland, still it is a book that is much wanted among us, for we are in a measure but beginners, in some branches of it at least. The training of fruit trees is well treated, and we commend it heartily to all our farmers. The American apples are better than the British, but not our pears, cherries, and gooseberries. Much information is contained in this work about these fruits. Every farmer and every man who has a garden, if it is no larger than a cabbage bed, should own such a book.

Premium Offered.

Mr. E. Anthony, of New York city, offers a reward of $500 for the most valuable improvement in photography, which shall be made before the close of the present year. The improvement may be in any branch of the art, or of any nature, and the artists of England, France and Germany are free to compete for the prize. The following committee will make the award:—Prof. Morse, Prof. Draper, of the New York University, and Prof. Renwick of Columbia College.