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Mechanics, the Agents of Power.

Nations are powerful in proportion to their productive capacity of things useful and necessary; but so far as the mere physical power of men are concerned, there is but little difference between those of different countries. The barbarian can endure as much toil and fatigue as the civilized man, and yet the productive powers of our country, in comparison with those of China, for example, with her 226,000,000 of inhabitants, is beyond calculation. How can we account for this? The Chinese are an industrious and patient people, and they have every variety of soil and climate, and yet they are weak and powerless in comparison with a nation having nine times less inhabitants.

There is one thing very evident to us as the ruling element of national power in modern times,—we mean mechanical genius, in the production of useful machinery. As a nation multiplies its machines, so does it multiply its power. The great and powerful nations of the present day, are those which have the greatest number of machines. For example, in China, the work which we do with machinery they perform with manual labor. With one steam engine of 100 horse power, we are able to do as much work as can be done there by a thousand men, and a thousand steam engines of an hundred horse power each, are equal to the labor of a million men. With all other kinds of machines, the same comparisons are equally applicable. This is the way we increase productive labor; this is the way we economise labor. In China there are few machines, and these are but rude; there are no steam engines, steamboats, railroads, power looms, wood planing machines, thrashing machines, reapers—none of those machines, countless in number, by which we economize labor, and render our country great in power and comfortable in its varied abundance. Every new machine invented to economize labor, therefore, is a public benefit, and every inventor a public benefactor. Oh, how much we owe to inventors: without them we have no reason for supposing we would be more comfortable, greater, or more civilized than the Chinese, or even ruder nations. But with all our machines, countless in number though they be, much is yet before our inventors to accomplish; their task will not be done until they have relieved man from an incalculable amount of drudgery, which he yet performs; not until they have placed him in a still more favorable position for his intellectual and moral developement.

Improvements in machinery, by increasing productive labor, give man more leisure, and thus increase his pleasures. A friend recently from France, who had visited a great number of flour mills in that country, spoke in sorrow of the continual drudgery caused by rude and inefficient machinery—enlightened and refined though that country is, and full of ingenious artisans. Day and night, from year's end to year's end, Sabbath days and all, the clatter of the hopper never ceased—the operatives were perfect slaves to the machines. With our improved machinery they could accomplish four times as much work, and thus find leisure to improve their minds, and rest their toil-worn frames.

In our last number a correspondent gave us pleasing information regarding his success in thrashing by a portable steam engine; this application of steam power, more universally adopted, will save a vast amount of labor. Plowing by steam is another application which, when fully successful, as it no doubt will be, will also effect an immense saving.

It is not possible for us to point out all the objects to which inventors can yet devote their energies and talents in making new conquests of mind over matter, but they are still as numerous as the sands on the sea shore. An inventor should have this thought ever present with him, "how can I best economize labor of any kind." Every person gains by improvements in machinery, and none so much as those mechanics who combine their own labors, with machinery, in the business in which they are particularly engaged. The manufacturer who makes the cheapest and best article, by having the most improved machines to economize labor, soon obtains a superior custom for his products, and thus while he benefits his country by adding to its productive powers, he also benefits himself. At every Exhibition of Industry,—such as the Fair of the American Institute now open in the Crystal Palace, this city, inventors and mechanics should scrutinize *every* machine and article exhibited, search out their defects, and study how to improve them. This is one excellent way to benefit themselves and their fellow men by improving and increasing the Agents of Power, and probably would result in profit in a pecuniary point of view to many.

Great Exhibition of the American Institute at the Crystal Palace, New York.

SECOND WEEK.

The day announced for the commencement of the Exhibition was September 22nd. On the 25th the Hon. Henry Meigs, Secretary, delivered his usual Annual Address. We noticed, however, a slight variation in its wording. Last year he expressed a belief that steam power was perhaps about to be superseded by a new motor then on exhibition. He alluded to Dr. Drake's exploding gas engine. This year, although he sticks to the annihilation of steam, he leaves out the gas machine, and substitutes electro-magnetism. His mind doubtless rests on the new electric engine, of Mr. E. C. Sherhard, now first exhibited, and of which we shall hereafter speak.

At the conclusion of his Address Mr. Meigs announced that the exhibition was formally opened. But there was nothing of any account to see, and therefore nothing to open upon. The managers had made known in their circulars, that articles could be sent in for competition until Oct. 4. The result is that the largest proportion of the exhibitors have delayed until the present week, to send in their contributions, and it is only now that the Exhibition has reached an organized or complete state. Better late, however, than never. The exhibition will be a splendid one, and promises to surpass all others, of a purely American character, that has ever been held in this country. At the time this report was written the contributions for exhibition were still pouring in rapidly.

Motive Power.

The display of working machinery, at this Exhibition, is unusually large, and the managers have made ample arrangements for the supply of motive power. The main line of shafting is driven by two horizontal steam engines, each of thirty horse power, as follows:—

Improved Steam Horizontal Engine.—By G. H. Reynolds, of Milford, Mass.—The improvements relate to a new cut-off arrangement, whereby the steam is used expansively, and results in a saving of fuel, the inventor informs us, of 25 per cent. It is alleged that the fact of this great economy has been fully demonstrated, in a number of instances, by the application of the invention to old engines. It may be applied at small expense. Another improvement consists in a peculiar construction of the pillar boxes of the main or crank shaft. The boxes are so arranged that they may be taken out and repaired without removing the shaft. In the ordinary engines, whenever the pillar boxes need examination or replacement, the shaft, fly-wheel, etc., must be removed. This necessitates the use of tackles, and the aid of a number of men, requires time, etc., the larger the machine the greater the trouble. The improvement above-mentioned obviates all this, and enables one man to do the whole. The boxes in which the shaft rotates, are divided vertically, instead of horizontally, and a strong strap covers the boxes and keeps them in place. By removing the strap, the fly-wheel having been first blocked up, the boxes can be taken out. A set screw in the side of the strap permits the horizontal tightening of the boxes laterally when desirable, which is the direction in which they wear the fastest. The common boxes can only be tightened vertically. The engine on exhibition operates extremely well, is beautifully finished, and reflects much credit on the inventor of the improvements, and on the manufacturers, Messrs. Hinkley & Equery, Bangor, Me. Price of engine $1000.

Improved Horizontal Steam Engine.—By William Burdon, Brooklyn, N. Y.—The power of this engine is thirty horses. Its construction embraces no special peculiarity. It runs beautifully, is elegantly finished, and looks strong and substantial. Mr. Burdon is well known as an extensive manufacturer of steam engines, and enjoys a high reputation for the excellent and durable character of the work which he produces. Besides the motor above noticed, he exhibits several other engines in the present Exhibition.

Telegraph Cables.

A case containing specimens of various submarine telegraph cables, is exhibited by the American, New York, Newfoundland, and London Telegraph Co.

England and Belgium.—The cable which extends from Dover, England, to Ostend, Belgium, is 70 miles in length. It consists of 6 small copper wires separately covered with gutta percha, and these again imbedded together in the same substance. The mass is covered by twelve large iron wires, which form a flexible shield of great strength. The cable complete is an inch and a half in diameter It was laid down in 1853.

England and France.—The cable which connects England and France extends from Dover to Calais, in France. Length 25 miles. Laid in 1851. Construction similar to the above.

Scotland and Ireland.—Extends from Port Patrick, Scotland, to Carrickfergus, Ireland. Length 29 miles. Laid in 1853. Same construction.

England and Ireland.—Extends from Dublin across St. George's Channel to Holyhead, Eng. Length, 69 miles.

Newfoundland and Nova Scotia.—Crosses the Gulf of St. Lawrence. Length, 85 miles.—Laid in 1856. This cable was laid by the New York, N. F., and London Telegraph Co. It is composed of 3 small copper wires, laid in gutta percha, and bound with strong iron wires.

Europe and Africa.—Crosses the Mediterranean Sea, and extends from Cagliari, the chief seaport of Sardinia, to Bona, the seaport of Algiers, Africa. Length 185 miles. Laid in 1856. Three copper wires, arranged as above.

Denmark and Sweden.—Extends from Elsinore to Helsingborg. Length, 12 miles. Laid in 1854.

England and Holland.—Extends from Oxfordness to the Hague. Four separate cables. Length, 108 miles. Laid 1854–55.

Varna to Balaklava, Black Sea.—Laid in 1854, and failed in 10 months. Composed of a single wire encased simply in gutta percha, the whole not larger than a quill.

The above comprise the principal submarine telegraph cables now existing.

Grate Damper.

This is a contrivance for use in connection with the ordinary parlor grates. It consists of a balance damper, which swings in the throat or opening from the grate to the chimney. Holes are made in the damper through which the gas and smoke escape, but the heat is really all thrown into the apartment. If an increased draft is wanted, as in lighting a fire, the damper is opened. It is alleged that the use of this invention in any grate will double the quantity of heat thrown into the apartment. If so, it is a great economizer of fuel. Price $3 and upwards, according to size. Can be readily applied to common grates. Exhibited by Jacob Cohen & Co., 45 Greene st., N. Y.

Solder-Iron Furnace.

This invention is intended to permit the use of anthracite coal for heating the solder-irons of tin-smiths. Charcoal is used at present, which is expensive. The apparatus exhibited at the Palace consists of a sort of stove, which is intended to be placed in the center of a large bench, for the convenience of the workmen. The sides of the stoves are perforated, and provided with tubes or sleeves, which extend into the center of the fire. The solder-irons are heated by being placed in the sleeves. This device insures the rapid heating of the irons, but prevents them from being burned or melted, or pasted up with dirt, saves the necessity of filing, &c. The saving of time by the removal of these objections is estimated at 12 per cent. for each working, while the cost for fuel is said to be six times less than that of charcoal used in the ordinary manner. The apparatus at the Palace heats 8 irons, and is intended for 4 workmen. Price $35, with cover for carrying off heat. Can be made of any desired size, with corresponding variation in cost. Patented by John Wilson, May 12th, 1856. Exhibited by the manufacturers, Wilson, Green & Wilson, Brandywine, Del.

Recent American Patents.

Hydraulic Brick Press.—By Ethan Rodgers, Cleveland, Ohio.—The followers which press the clay into the molds are operated by hydraulic pressure. A large and small pump are employed, and the parts are so arranged that the necessary pressure is obtained, and the machine worked with rapidity.

Chimney Register and Weathercock.—By J A. Royce, Lee, Mass.—On top of the chimney is placed a device similar to an ordinary slatted hot air register. This register has a vane and rudder, and is turned to the proper position by the action of the wind against the rudder, and its slats, after it is thus moved, are closed more or less by the action of the wind against a sail, which is on a mast projecting up from the slats. When the wind blows hard, the slats are operated so as to almost entirely close up the flue of the chimney and thus diminish the draft, and when it is calm they open the flue and thus increase the draft. The design of the improvement is to avoid a greater consumption of fuel during windy weather than there is when the weather is calm.

Fly Trap.—By Dr. Samuel Arnold, Green Hill, Tenn.—A hemispherical glass vessel filled with soap suds is provided, over which a hollow cylinder is placed. The cylinder communicates with the glass vessel, and is provided with grooves on its inner side to receive some condiment attractive to flies; it is also perforated, to allow the flies to enter, and pass to the condiment. The cylinder also has a piston. When a number of flies have entered the cylinder some one around the table revolves it, and thereby frightens the flies, which in a moment thereafter are precipitated into the soap suds by the automatic descent of the piston.

New Bomb Shell.—By A. M. George, of Nashua, N. H.—Consists in constructing a shell with a separate chamber or cavity in front of the chamber which contains the powder or compound by which the shell is exploded. The said chamber is filled with melted iron or other metal, which will be scattered by the explosion of the shell, inflicting great injury. It further consists in certain means of protecting the charge of powder or explosive compound from the heat of the melted metal in the front part of the shell during the placing of the shell in the piece of ordinance for discharge. The fuse is ignited in the same way as that of the common bomb-shell, and when the charge in the chamber becomes ignited, the said chamber and the whole of the shell explode at once, and the melted metal is scattered about, to the destruction of everything surrounding the spot where the explosion takes place.

Contrivance for Notching Barrel Hoops.—By Daniel Lamson, of East Weymouth, Mass.—Consists in the use of a reciprocating knife and inclined plate, whereby the ends of hoops may be properly notched, and with the greatest facility. The above invention is simple, performs the work in a rapid manner, and the cost of construction is trifling.

Machine for Painting Wheels for Vehicles.—By S. B. Fuller, of Worthington, Mass.—Consists in having a vibrating and rotating spindle pass through the bottom of a tub or reservoir in which the paint is placed. The wheels being placed one at a time upon the spindle, are immersed in the paint by depressing the spindle. They are then raised above the surface of the paint, and the spindle rotated so that the superfluous paint will be thrown from the wheel by centrifugal force. It is said that two men can perform as much work with a

machine of this kind in a given time as ten men can by painting in the usual way.

Stave Machine.—By A. H. Crozier, of Oswego, N. Y.—Consists of a wheel having cutters attached and used in connection with adjustable gauges, plates, and screws. The staves will be jointed with more or less bend or taper, according as the plates are adjusted higher or lower, which adjustment is obtained by operating the set screws. The above invention is exceedingly simple, and is said to operate well. It may be cheaply constructed, and there are no parts liable to get out of repair.

Blow Pipe.—By S. B. Palmer, of Tully, N. Y.—Two wind chests are employed, connected together by a small pipe, which is provided with a faucet. These parts are so arranged in connection with the pump and blow pipe that a jet of air of equal volume is forced in a regular manner from the nozzle of the blow pipe. The above improvement has been practically tested, and operates well. The whole affair is portable, economical to manufacture, and there are no parts liable to get out of repair.

Door Lock for Railroad Cars, &c.—By Thomas Slaight, of Newark, N. J.—Consists in having a hasp fitted over a socket of a lock, and securing said hasp on the socket by means of a plug, which passes through the hasp and socket into the lock. The plug is secured therein by means of elastic or yielding jaws, arranged relatively and combined with a turn plate and slotted tumblers. The above improvement is far preferable to the ordinary padlocks. It is, in reality, a tumbler lock, and may be made equally as secure against burglars or lock-pickers as bank safe locks. Sufficient play is allowed the hasp on the socket, so that the door may yield to a certain extent, in case heavy weights press against it.

Bleaching Cotton and Linen Fabrics.

The common process of bleaching the above named fabrics, is by boiling them first in lime water, or a caustic alkali, then steeping them in successive clear liquors of chloride of lime, treating them with dilute sulphuric acid, called *sours*, and then thoroughly washing them. Although these fabrics can be bleached perfectly white by strong liquors, in a few hours; the common practice is to use weak liquors, requiring several days to complete and much labor to execute.

Two patents have recently been taken out in foreign countries, for different methods of bleaching. The one by Pierre J. Davis, of Paris, is quite an original process; he employs for this purpose chloroform in a state of gas. The cotton fabrics are placed in a close wooden box to which steam is admitted from a boiler, at a pressure of 60 lbs. to the square inch; this box contains a liquor made of carbonate of soda (crystallized soda,) of a strength about 4° in the hydrometer, and the goods are steamed in this for about two hours, then allowed to cool. The box must have a safety valve on it, and an emission steam pipe. After this the goods are taken out, dripped, and placed in another close wooden box lined with lead, but communicating by a pipe with a chloroform generator. This consists of an earthenware vessel into which 3 lbs. of bleaching powder (chloride of lime,) 3 lbs. of slacked lime, a quarter of a pound of alcohol, and 9 lbs. of water, are placed together and stirred. About one pound of hydrochloric acid is then poured upon these materials, when the chloroform gas begins to generate, the cover is then put on the generator, and the gas conducted by a pipe into the leaden chamber which contains the fabrics. This gas half bleaches the goods in the course of an hour or so; when hydrogen gas is introduced into the box, to expel the chloroform. The goods are then submitted a second time for a few hours, to the action of chloroform gas, made of a like quantity of materials, but distilled from a zinc retort heated to 145° Fah. After this operation oxygen gas is admitted to the goods, which imparts to them a bluish shade. They are then taken out, washed, dried, and finished. This process may be very effectual, but it appears to be too complicated for common practice.

The other patent is that of H. Hodgkinson, of Belfast, Ireland, and consists of a steam-tight box half filled with bleaching liquor (chloride of lime) heated by steam, and having within this box a revolving wheel made with apartments containing the fabrics to be operated upon. Each apartment has a door to put in and take out the goods, also openings in the bottom, to allow the entrance of the liquor. As this wheel revolves, the goods are dashed, as it were, through the hot liquor in the box, and are thus bleached rapidly and evenly.

By the common method of bleaching, the liquors used are all cold, because the chlorine gas is expelled by a very moderate heat, but as the gas operates far more rapidly when hot than cold, it certainly can be saved, and the process accelerated, by bleaching in tight boxes heated by steam.

The Moon's Rotation Again.

This question has been violently discussed for the past six months in the London *Times* and London *Mechanic's Magazine*. It is the revival of an old controversy caused by a letter of Mr. J. Symons, Inspector of Schools, in the *Times* of April 9th. Mr. Symonds took the position that as the moon always presents the same face to the earth it cannot have a rotation on its axis, and that the prevailing opinion taught in astronomical works that it rotates on its axis once in 28 days exactly, to a second, is wrong. He has been supported in his controversy by Evan Hopkins, who, like himself, was educated at Cambridge, also David Muset, and lately a German mathematician, John Von Gumpach, has published a pamphlet supporting the same views, in which he asserts that Newton's proposition relative to the moon's rotation has been entirely misunderstood by his followers. Dr. Lardner has just come out in defence of the moon's rotation, and Dr. Whewell read a paper on the same side before the late meeting of the British Scientific Association. These names will show the interest which the question has excited among men eminent in science.

We have received an immense number of letters on this subject, but decline to publish them, being content to state the question, to let our readers know that such a controversy is still going on among eminent mathematicians in England.

After reading almost all that has been said on both sides, we must say that the controversy seems to be as near an end as when it began, and as satisfactory as if it were decided that both sides had gained the victory.—Mathematics, instead of making some men correct thinkers, leads them to be speculative and vague reasoners.

If the moon does rotate on its axis in 28 days exactly—during the period of her revolution around the earth—a working model can be constructed to show these two motions, conjointly with the earth's motion; this is the test we have demanded of those who advocate this side of the question. There is no use of them spending so much ink and words in the controversy, let them demonstrate. This is the best advice we can give them, and until they comply with it we must hold them responsible for propagating opinions which they cannot support by actual demonstration.

Death of George Steers.

This eminent naval architect met with a sudden death on the 26th ult., and our country has been deprived of one, in the very vigor of manhood, being only thirty-seven years of age, who has rendered his name famous throughout the world. While proceeding in a wagon to Long Neck, L. I., to bring home his wife, his horse ran away, and having jumped out of the wagon with a view of stopping the animal, he was struck by the wagon and prostrated senseless on the middle of the road. In this situation he was discovered by some persons who knew him, and who were riding in a carriage; he was then instantly taken up and driven to his house in Cannon st., this city, where medical aid was quickly obtained, but was of no avail; the spirit departed at 10 o'clock in the eveuing.

In 1853 the name of George Steers became a national theme of praise, on account of the splendid triumph of the yacht *America*—of which he was the builder—in England. It then won the prize as the fastest yacht of all nations in a contest with the yachts of the Royal Club. Since then he has built the yacht *Julia*, which has carried off the prize in every regatta which she has entered. He was selected, from his known ability, to build the great steam frigate *Niagara*—the only one of the six new frigates constructed by private parties; he was also the naval architect of the *Adriatic*—the new Collin's steamer. Both of these great steamers are splendid specimens of his skill, but he has not been permitted to witness their full completion; death has closed his eyes before they have been able to make their trial trips, which are expected to come off this month.

Although cut off so suddenly he has lived long enough to leave his mark on the pages of history—a nobler one than that of many distinguished statesmen—he was the builder of the yacht *America*.

A Miller's Patent Case.

From our worthy cotemporary, *Newton's London Journal*, we learn that a very important patent case, relating to grinding flour, was tried at Queen's Bench, before Lord Chief Justice Campbell, and a special Jury, on the 4th and 5th of July last. The plaintiff was G. H. Bovill, the defendants, Keyworth & Seeley, millers, at Lincoln, Eng. The suit was for damages for infringing the patent of plaintiff, granted 1849, for combining an exhaust with a blast in grinding flour, to prevent the dispersion of *stive* or fine flour through the mill, and thus, as was facetiously observed, "enable the miller to wear a black coat." The defence set up was, that the plaintiff was not the first inventor; that the improvement was suggested by a workman under his employ; also that it had been used by Mr. Muir, of Glasgow, prior to the date of the plaintiff's patent.

In 1846, the plaintiff obtained a patent for introducing a current of air between the mill stones, which cooled the grinding surfaces, and prevented clogging of the flour. It was a good improvement, as it enabled a run of stones which were only able to grind four bushels per hour, to grind double that amount, but owing to the flour and blast being carried together through the spout, a prodigious dust was created in the mill chamber below. A cloud of *stive* prevented the millers from doing as much work as formerly, and it was also injurious to their health. This was an evil which the plaintiff saw when he first put up his apparatus, in a mill at Battersea, and he at once instituted experiments to remove it. This he at last successfully accomplished, by enclosing the stones completely, and combining an exhausting apparatus with the cooling blast: the former to withdraw the *stive* from the upper part of the mill stone, and lead it away into a receiving chamber, while the flour passed down into the spout in a contrary direction. The *stive* was thus all saved; the moisture was extracted from the flour, which went below dry and cool; the dust in the mill was avoided, and "the miller could wear a black coat like a parson." The patent, as has been stated, was obtained in 1849, and came into use immediately, for the flour so manufactured was found to be a superior article. The defendants in this case took out a license from the plaintiff, in 1851, agreeing to pay £1700 (about $8,500) annually. This sum was paid for two years, when it was refused, in 1853, the grounds for such refusal being those we have stated, as their defence.

The evidence of the workman, whose invention it was stated to be, was introduced; but it was proven that he was employed and paid to make the experiments instituted by the patentee,—that he merely did the work suggested and planned for him. The evidence of Mr. Muir was also taken; and he indeed stated that he had combined—prior to 1849—an exhaust with a blast,—and that he had drawn sketches of his apparatus, and had sent them to England, and these were also produced in evidence. It was from being informed of these things, that the defendants refused to pay Mr. Bovill his license any longer; hence came this law suit.

All the testimony given in defence failed to convince the jury, or the Judge, that the plaintiff was not the first inventor, for it was also proved that Mr. Muir had discontinued the use of his apparatus, and consulted at one time with Mr. Bovill, for a licen e, hence it was concluded—and reasonably we think that Muir had never perfected his plan, and that Mr. Bovill was the first who had rendered the invention useful—a success.

The amount of damages claimed, was £1239 11s. 6d., for the use of the patent for nine months less one week, this being the term since the plaintiff had entered a disclaimer, in May, 1855, to the day the action was brought in January last. The Jury found the verdict for the plaintiff to this amount, thus establishing his entire claims.

The Lost and New Arts.

In the opening annual address delivered last week before the American Institute by Hon. H. Meigs, allusions were made to arts supposed to be lost, and to a great discovery about to be made; these deserve some notice at our hands. He said:—"In truth it is justly believed that many inventions greater in value than any we have now, have been lost for want of such an opportunity for fame and profit. (The opportunity referred to is Industrial Exhibitions.) It is believed we have lost malleable glass; we can no longer make cutting instruments out of copper, as was done 3000 years ago; nor have we the art of making the steel of Damascus, nor the sword blades of old Seville."

We do not believe that a single useful ancient art is unknown at the present day. It by malleable glass it is meant that the ancients made glass which could be forged and welded like iron, we must say that there is not a shadow of good evidence that such glass was ever known. There is no manufacture whatever in which the moderns so much excel the ancients as in that of glass of every kind. The old cutting instruments were made of bronze, and such can be manufactured at the present day; but neither the old nor new bronze cutting tools are equal to those made of steel. The sword blades of old Seville were no better than those now manufactured in our country; in Damascus, sword blades are still forged, and with all their ancient excellence, but the steel for them is imported from India. The reputation of Damascus swords is deserved, but the French cutler's sword blades of the present day rival them in appearance and quality.

Industrial Fairs are very ancient institutions. Such fairs were annually held in Greece, and merchants from all parts of the known world went there to exhibit their wares; and it was an established law of the land that even during a state of war between the different States the merchants were protected, and allowed to travel to and from them without annoyance. These fairs passed from Greece to Europe, and have come down to us from generation to generation. They have been the means of extending a knowledge of the arts, and exciting inventors to improvements, and their influence is extending broader and deeper every year. Mr. Meigs did not magnify their importance too highly in his address; what he said respecting their utility was perfectly correct, but if any old art has been lost it has not been owing to the want of them, even in the middle ages.

In this address the idea was presented that we were on the eve of some great discovery which is to supersede steam everywhere; this discovery was stated to be electro-magnetism; and Dr. Lardner and Newton's *London Journal* were quoted as authority in favor of such views. We would like to know the basis for announcing such opinions, for the laws of electro-magnetism are now very well known, and they do not afford any grounds for leading us to adopt the opinion that electro-magnetism can ever take the place of steam as a general motive agent. Electro-magnetism can operate machinery like steam, or water, or wind, but it is a far more expensive agent. About twenty years ago there was considerable excitement respecting electro-magnetism superseding steam power, and a number of such engines were then constructed, therefore it is not by any means a new power. We therefore cannot conceive how we can be "on the eve" of such a new discovery as an electro-magnetic motor, to supersede steam power, according to the opinions expressed in Mr. Meig's address.