Scientific American

NEW YORK, MAY 17, 1851.

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.

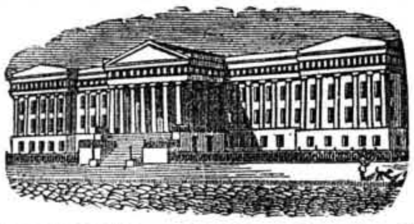
EPISODES OF INSECT LIFE.—This is a beautiful volume, published by J. S. Redfield, Clinton Hall, this city. It is illustrated withsome of the most quaint and beautiful figures that we have ever seen. The object of the author is to render the study of Entomology—the science of insects—more popular and attractive to the generality of mankind; and well has the *incog.* author, who styles himself "*Anschiti 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.



☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING MAY 6, 1851.

To Linus Yale, Jr., of Newport, N. Y., for improved Lock and Key.

I claim, first, the self-detaching and attaching key, for the purpose and object described.

Secondly, in combination with said key, I claim a powder-proof key-hole, consisting of two or more parts so constructed that the outer part is turned by the key, while, at the same time, the inner parts, with the pod or pods of the key enclosed are disconnected and moved entirely away from the outer, the same movement causing solid metal to occupy the space left, and thus to effectually bar an entrance of any kind to the lock, when its parts are in a position possible to be unlocked.

To Thomas Vanderslice, of Valley Forge, Pa., for improvement in Meat-Cutting Machines.

I claim the herein described mode of adjusting the cutters by means of the adjusting plates.

To Charles Burt, of Belfast, Me., for Exploding Harpoon.

I claim, first, the interior of the harpoon made as a pistol barrel, with percussion lock protected from water or outward accident, and the trigger of which can be actuated by means of a pull on the line, and the resistance of the flesh, substantially as described.

Second, I claim the making the point of the harpoon the projectile which is shot into the whale, in the manner and for the purpose substantially as described.

Third, I claim the arrangement of the trigger in the shank under the barb, in the mode described, preventing the explosion of the charge until the line is drawn by the whale or the harpoon.

To J. R. St. John, of New York, N. Y., (assignor to James Renwick, G. F. Barnard & E. B. St. John,) for improvement in Hand-Logs.

I claim, first, the arrangement of the log glass, lever, pinion, and wheel, whereby the motion to the clock-work by the reel is communicated to the index during a definite period of time, determined by turning the log glass on or off the lever, the parts being so proportioned, and the dial so divided, that the index, moving while the sand is running in the log glass, shows the rate of speed at which the vessel is moving per hour of time, during fourteen seconds, or any other known space of time; the parts being arranged and operating substantially as described or in a manner equivalent, to produce the same results by like means.

Second, the application of a parachute to the purpose of a "log ship," and the combination therewith of the cylindrical wedge or its equivalent, to enter between the tubes to keep the "log ship" spread, when in the water, and disengaged when hauled on to "fetch home," so that the log ship closes and turns end for end with the water, and is easily hauled on board, said log ship being used with the reel and registering parts herein described and shown, or with any other means of supplying and determining the amount of line run out during a known period of time, substantially as described and shown.

To Nelson Goodyear, of New York, N. Y., for improvement in the manufacture of India Rubber.

I claim the combining the india rubber and sulphur, either with or without shellac, for making a hard and inflexible substance hitherto unknown, substantially as herein set forth.

And I also claim the combining of india rubber, sulphur, and magnesia, or lime, or a carbonate, or a sulphate of magnesia, or of lime, either with or without shellac, for making a hard and inflexible substance hitherto unknown, substantially as herein set forth.

To J. R. Kain & Spencer Lewis, of Tiffin, Ohio, for improvement in Bedstead Fastenings.

We claim providing the upper section or part of the cylindrical box, with a triangular and two parallel wedge-shaped wings, made sharp and projecting from its periphery, in such a manner that the triangular projection shall open a groove or way in the post, which shall be closed by the entrance of the parallel wedge-shaped wings, which follow as the section is driven into the post, and thus crowd the wood in front of the shoulder of the triangular projection, and form a complete lock thereto, as described.

We also claim dividing the cylindrical box longitudinally into two equal parts or sections, the line of division inclining upward at an angle of about 10 degrees from a horizontal plane, by which the edges of the upper section are made to serve the purpose of wedges for forcing the teeth of the lower section into the post and holding it securely, as described.

To J. A. Cutting, of Philadelphia, Pa., for improved Spark Arrester.

I claim, first, the air flues in the lower part of the diaphragm constructed in the manner and for the purpose herein described.

Second, I claim the pipes or conductors in combination with the air chambers (two) arranged substantially as herein described.

Third, I claim the combination and arrangement of the air flues with the air chamber, reverberating cone, inclined and curved flues, for the purpose and in the manner herein fully set forth and described.

To Nelson Newman, of Cincinnati, Ohio, for improvement in Pumps.

I claim the combination and arrangement of the valve chest, water passage, pump cylinder, and air vessel, as herein described, so that the whole can be cast in a single piece, and the valves and suction pipe supported and secured in place by another piece also cast in the form herein described, whereby the cost of making the pump, and its liability to get out of order, are both lessened without impairing its efficiency or rendering it more difficult to repair.

To R. E. Schroeder, of Rochester, N. Y., for improvement in Lime Kilns.

I claim the flues encircling the cupola and provided with apertures or flues (five) for admitting the heat and flame to the action upon the limestone, from various points, substantially as described, in combination with the air chamber encircling the cupola as described.

And I claim, also, the aperture and passage therefrom, for saving the heat arising from the manufactured lime while being removed, all operating conjointly in the manner and for the purpose herein fully set forth.

To John Gorrie, of New Orleans, La., for improved process for the artificial production of ice. Ante-dated Aug. 22, 1850.

I wish it to be understood that I do not claim as my invention any of the several parts of the apparatus in themselves, but I claim, first, the employment of a liquid uncongealable at the low temperature at which it is required to keep the engine, to receive the heat of the water to be congealed, and give it out to the expanding air.

Second, I claim the employment of an engine, for the purpose of rendering the expansion of the condensed air gradual, in order to obtain its full refrigeratory effects, and at the same time render available the mechanical force with which it tends to dilate, to aid in working the condensing pump, irrespective of the manner in which the several parts are made, arranged, and operated.

Third, I claim supplying the water gradually and slowly to the freezing vessels, and congealing it by abstracting the heat from its under surface, substantially as set forth.

And lastly, I claim the process of cooling or freezing liquids by compressing air into a reservoir, abstracting the heat evolved in the compression, by means of a jet of water; allowing the compressed air to expand in an engine surrounded by a cistern of an unfreezable liquid, which is continually injected into the engine and returned to the cistern, and which serves as a medium to absorb the heat from the liquid to be cooled or frozen, and give it out to the expanding air.

To Florentin Joseph de Cavaillon, of Paris, France, for improvement in purifying Illuminating Gas.

I claim the purifying powder for illuminating gas, said powder consisting of sulphate of lime, either natural or artificial, in connection with some inert substance, or substances, partly inert and partly rendered purifiers, when compounded in the proportions substantially as described herein.

To T. J. Sloan, of New York, N. Y., for machine for assorting screw blanks, etc.

I claim the combination of the series of shifting ways, with the main or stationary ways, for the purpose and in the manner substantially as specified.

And I also claim the detector, substantially as specified, in combination with the stationary and shifting ways, substantially in the manner and for the purpose specified.

RE-ISSUES.

To J. B. Hyde, of New York, N. Y., (assignor to T. J. Croggon, administrator of T. R. Williams, deceased), for improvement in machinery for hardening bats in felting, &c. Originally patented Dec. 14, 1840.

What is claimed as the invention of the said Thomas Robinson Williams, is the method substantially as described, of forming the bat by the combined use of two endless aprons which receive the sliver from the doffer, or a carding engine, or otherwise, between them, and from the bat on one of the belts, whilst the other acts as a support, substantially as described.

To J. B. Hyde, of New York, N. Y., (assignor of Thomas Croggon, administrator of T. R. Williams, deceased), for improvement in machinery for forming bats for felting, &c. Originally patented December 14, 1840.

What is claimed as the invention of the said Thomas Robinson Williams, is, first, the method substantially as described of hardening the bat, by passing the same between two series or tiers of rollers, covered with cloth, or otherwise, and arranged over each other, the one series being provided with a reciprocating, endwise motion, for the purpose of felting the bat; and the other series with a progressive rotary motion, far the purpose of feeding the bat through, with or without the use of a trough, containing hot water and soap-suds or other matter, substantially as described.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

[Continued from page 270.]

The process of making oil gas is much more simple than that of coal gas; as the purification is wholly dispensed with; the constituents of the oil being such that there is no combination of sulphuretted hydrogen or ammonia. In the arrangement of the generating apparatus, the two processes differ essentially. The oil is not introduced into the retort and subjected to decomposition in quantity as is the coal; for in such a case the greater part of the oil would distil over, without undergoing much alteration, and the portion only which is in immediate contact with the heated surface would be converted into combustible gas. What is required and the chief object to be obtained is, to bring a small quantity of oil to a high temperature, in order that all its particles may be decomposed at once; and for this purpose the following arrangement for generating is used:

The ordinary oil gas apparatus consists of a small cylindrical retort of cast iron, set in a furnace, and brought up to a proper temperature by fire which is conveyed around it by suitable flues. The retort is partially filled with coke, brick, or some other similar material, for the purpose of presenting a larger amount of heated surface; the oil is then conducted from a reservoir above, through a pipe in a small stream into the retort upon the heated surface, when it is immediately decomposed; gases are given off, accompanied with a considerable quantity of vapors which are liquid at common temperatures, and a large deposition of carbon takes place in the retort.

The coke or bricks are changed every fortnight or three weeks, as the interstices become obstructed by the deposite of carbon. The best results are obtained when this gas is produced at a low temperature; as this temperature suffices to convert the oil into gas, but is not sufficiently high to decarbonize it to any great extent. The secondary and the only product of this distillation is an oily fluid, consisting of tryile, dytryile; and a third hydro-carbon.

From the retorts the gas is conveyed into a condenser similar to the one described under coal gas, and from thence, after passing through the meter where the quantity is registered, it is conducted into the gas-holder, where it is ready for distribution, which is performed in the same manner through street mains as the coal gas. In some manufactories, of late years, the gas before entering the street mains, is allowed to pass through a "mixer," by which from 20 to 23¼ per cent. of atmospheric air is permitted to unite with it; and it has been stated by the patentee, (for by the way this mixer is a patent article) and others interested, that this is an improvement, and enhances the value as an illuminating agent. It must appear, I think, very evident to an unprejudiced mind that mixing air with gas is a corruption by this foreign compound and not an amelioration. It may be an improvement as regards quantity, I admit, but the quality will be lessened in an exact ratio to the adulteration.

A serious objection to oil gas, is the gradual liquefaction which its important constituents undergo; the gas contains too large a proportion of vapor, which is constantly condensing while standing even at common temperatures; and not only a great loss is sustained, but no small inconvenience from the clogging and stopping of pipes. In England much controversy was carried on between the oil and coal gas companies; large amounts of money were expended in the erection of oil gas establishments, and great skill and strict economy were used to promote success; to sustain them no effort was wanting on the part of those who had invested their money; and, in opposition to facts which were glaringly evident to the most careless observer, it was proclaimed that the illuminating power of oil gas was threefold greater than that of gas made from coal, and that it possessed, therefore, three times its value, whereas it has been demonstrated, that, by converting oil into gas, a loss of nearly one-third of its value for purposes of illumination is sustained. The following extracts from the Enclyclopedia Britannica will fully substantiate these statements. "Oil being decomposed at a loss of nearly fifty per cent., the conversion of it into gas, after a protracted but ineffectual competition with coal, has been gradually abandoned on the large scale, even in those places where, from the interests of the whale fisheries, there were the strongest inducements to foster the unfounded prejudices which prevailed for some time against the use of coal gas. The exaggerated advantages which it was pretended would be derived from compressing oil gas, and thus rendering it portable, served to prolong the gross delusion on the subject. Nor were these delusions fully removed, until a demonstration was given of the failure of the scheme, in the decay of costly edifices and expensive apparatus, which, in defianee of all sober calculations had been constructed for carrying it into effect." "The capital expended upon oil-gas establishments is actually applied to reduce to the extent of thirty per cent., the intrinsic value of the raw material, which it was pretended to improve in an equal degree; add to this the loss of gas in the main pipes, which is found to be fully twenty per cent., and it follows that the light from oil gas is obtained at twice the expense at which it may be procured from the oil itself."

Manufactories for the generating of gas from oil have also been erected in this country, and the gross delusion has been somewhat prolonged by the introduction of the supposed improvement, viz., the mixer; but the results have been the same, the amounts expended have been sacrificed, the works abandoned and superseded by a cheaper light, and it is now very generally acknowledged by all scientific persons, that gas made from oil can never successfully compete with that generated from coal.

J. B. B.