For the Scientific American.

The Electric Light, &c.

I had determind not to notice any remarks made by annonymous writers in the public journals, on the subject of the Hydro-Electric Light, deeming the fact of its public existence and action sufficient refutation of the many absurd attempts to disprove the discovery of a new principle, by instancing the failure of the same experiments when presented under the guidance of old theories. Had I at any time asserted that I had produced the rapid decomposition of water by the same means and process that has hitherto been taught by the books and the schools, I should deservedly have made myself the subject of newspaper ridicule—the theme of anonymous penny-a-liners. But as I have from the first claimed the discovery of a *new* principle, and the production of new results. I deny the right of any one, or the possibility, however honest he may be, to sit as arbiter on the matter, till such time as the nature of the discovery is made known, and as for a few weeks past I have been busily engaged getting a new apparatus ready for public inspection abroad, which would satisfy those skeptics whose distance from this city has prevented a personal examination of the apparatus. I have not had time nor inclination to notice the many absurd paragraphs, pro and con, which appear in the public journals, and the only consideration which now urges me to make this communication, is that it is both due to the public and myself to make such an explanation as will relieve the curiosity of the one, and extricate the other from the unpleasant position which the enthusiasm of his friends has placed him in.

During the winter of 1844-5, the late Col. Bomfort, of the Ordinance Department, and myself were engaged in some experiments, having for their object the precipitation of silex (in solution,) by the action of electricity; it being expected that glass so formed would be very dense, and consequently possess a high refractive power. During the course of experiments I became satisfied that so long as the whole body of water around the poles remained a conductive or diffusive medium, the action of the passing currents would be limited, and the results desired unattainable. With this view of the subject I sought for some method by which the atoms of water in contact with the poles, could be effectually barred from communication with any conducting substance, and yet admit of a continual supply of the water to be decomposed.

Believing in the doctrine of imponderability and immateriality of the electric fluid, all efforts to accomplish the desired result failed, and the experiment was about to be abandoned, when a doubt as to the truth of the books, on the question of the nature of electricity, arose in my mind, and on the faint hope held forth, the experiments were renewed, and the results more than realized the most sanguine expectations, for not only was the insulation of the water perfect, and the decomposition rapid, but the electric fluid was found to be susceptible of accumulation and condensation to an unlimited degree. The ease and rapidity with which the water was resolved into its component gases, naturally suggested the idea of applying the discovery to some practical use, and that of light was selected, as the most simple and inexpensive in its application. But on the very threshold of the experiment an apparently insurmountable obstacle was met in the inability to separate the gases.—After a number of serious explosions, the entreaties of my family compelled me to desist.

Although the practical experiments were abandoned, the mental action on the subject was not, and during some time in the fall of 1848, I concluded that the law which demanded an aqueous communication between the poles, or that the positive and negative poles should both enter one body of water, was not correct—a conclusion which a very simple experiment decided to be correct. One pole was inserted into a glass of water in the corner of a large room, and the other pole in another glass in the opposite corner, and an electrical communication made between. All the water in one glass was decomposed, and hydrogen only obtained. All the water was decomposed in the other, and oxygen only obtained. The result was known, the experiment was considered fully successful, and a small electro-magnetic apparatus, having its helices kept in motion by clock work, was put in operation at my dwelling, and was found capable of supplying three burners with an abundance of the gases. It was at this period of the experiments that I issued the circular announcing the discovery, and with it an invitation to the citizens of this place to call and examine for themselves.

In the spring of 1849, a light-house was erected on an eminence, near this city, and the experiment tried on a large scale for several months, at the light house, besides the lighting of a store in the city, the results being entirely successful in both places, and fully justifying the assertions made in the circular of announcement, and here I wish it to be understood, that this must not be considered a mere statement of mine, but the history of the fact is familiar to all whose appreciation of the discovery was sufficient to prompt them to visit my tower or dwelling.

The experiments at the light house continued until September, when an explosion occurred which cast a momentary damp upon the bright prospects of the discovery. This explosion was not due as intimated by "Carburetted Hydrogen," to the explosive nature of the gases, but to an entirely different cause—one peculiar to the construction and action of the instrument under consideration. That state or action of electricity known as Galvanism, produces decomposition; while that known as intensity, causes repulsion to take place at the electrodes, and deflagration of the decomposing cells is the consequent result. It was to the latter action that the explosion referred to was due, the gases being fired by the melting electrode. The realizing of the possibility of such an accident made it apparent that some method should be desired, other than that of personal observance, to prevent such explosions in future. The same agent that caused the danger must be made to remove it; this was no easy task, for independent of the natural difficulty in the case, the press was teeming with scurrilous inuendoes: the only difference in whose tenor was, that one journal consigned me to contempt as a humbug, and another to confinement as a lunatic. It is well, however, for the cause of science, that inventors are generally stubborn beings, firmly believing that they are able to perform all they promise, against all the sneers or contempt that may be brought to bear against them, and so in this case, perhaps, the "captious" feeling saved the invention, for the difficulty was overcome, and the apparatus made to govern itself, by the breaking of its circuits when a surcharge is passing.

It has required the labor of months to accomplish this last mentioned part of the invention, and although at the period of writing this, the danger of an explosion is entirely removed, yet the loud reports made by the breaking of the circuits are deemed adverse to the successful introduction of the invention to the public, but it is confidently expected that even this difficulty will be overcome in the course of a few days. Meantime the apparatus and its action is the daily subject of inspection at my rooms in the Exchange—nothing being screened but the interior of the helices and electrodes. The whole process of the decomposition can be seen, and if necessary, felt of.

The result of all the experiments up to this date are as follows:

The descent of a weight of 67 lbs. a distance of 9 feet, will generate 800 cubic feet of the gases, at no other expense than the interest of the cost of the apparatus, say $500. You may use the gases for light, power, or purposes of caloric. (I have as yet experimented only with the former,) and make your own deductions.

I receive many letters from your readers, asking what I claim as my invention: permit me here to reply, that I claim to have *discovered* a new principle in electricity, viz., ponderability, materiality, and obedience to the laws of gravitation. I claim to be the first to accumulate and compress the electric fluid; and I claim to have invented a machine or apparatus which enables me to use the electric fluid for useful purposes in the arts and sciences, at no other cost than the interest of its price.

HENRY M. PAINE.

Worcester, March 7, 1850.

Franklinite Iron and Zinc.

We hail with great pleasure every new discovery in science and in art, which may tend to develope the vast and almost countless treasures of our great country.

The working of the extensive mines of Franklinite and Red Oxide of Zinc, located in Sussex County, State of New Jersey, will not only richly reward the proprietors, but add much to the national wealth of the Republic.

It is within the memory of the present generation of men that from the vast coal fields of Pennsylvania, but a few hundred tons of fuel found its way to the seaboard, now its products are numbered by thousands and tens of thousands of tons, producing millions of dollars per annum. The great mineral riches of the United States, as yet, have hardly received a passing notice from our merchants and men of capital. Our countrymen generally have not much skill in Minerology and Metalurgy. We want schools for educating our young men in these branches of science, which will bring from the bowels of the earth the hidden wealth of centuries. Commerce has been the idol of our enterprising men, since the days of the Revolution. Alas! how many have found it a sea of storms and shipwreck and of ruin. And there are many of our old and highly respected merchants of the present day, who continue in business, not because it is found as profitable as in former days, but because they wish to bring up their sons to business, and choose their own calling, from the fact that they possess little knowledge beyond it. If one hundred millions of dollars could now be abstracted from commerce, where it is paying, upon the average, but a bare commission, and placed in a position to develope the mineral resources of our country, it would add to the national wealth at least twenty-five per cent. of the whole capital employed annually. The extensive machinery and other iron used incident thereto, in such steamships as the Ohio and Georgia, cost over $200,000, each, and much of the raw material is brought from abroad. Is the imported article superior to the American? Let the different tests speak for themselves:—

Geologists' Table.—Best Swedish Bar Iron required 72,064 lbs. force to sever a square inch: best English Bar Iron, 61,600.

Murray's Test, (Vulcan Works, Baltimore.)—Sussex Bar Iron, made from Franklinite, required 77,000 lbs.

These tests show that the iron made from Franklinite is the strongest article of the kind now known, requiring 15,400 lbs. more force to sever it, than the best English, and 4,936 more than the best of Swedish.

This American Iron must come into general use for wire bridges, railroad axles, chain cables, &c., as the company are prepared with works of sufficient magnitude to meet the demand necessarily produced from its great tenacity. Mr. Murray also made a test of the strength of the Zinc manufactured from the Red Oxide, and certifies that it is 10,000 lbs. stronger than the zinc of commerce. We learn that a metal of this kind is much wanted for ship bolts as a substitute for copper.

The Climate of Georgia.

Mr. J. T. Douglass, of Wallace Jones Co., Geo., writes us that he received a few fine red June apples that were gathered in the orchard of Mrs. Douglas, in the upper part of Gwinett Co., Geo., in the month of last December, and were the third crop of the season, and trees in the orchard were then full of blossoms for the fourth crop at the same time. Georgia embraces a great variety of climate, and is a great and rapidly growing State.

Gen. John McNiel, Surveyor of the port of Boston, died in Washington on the 2nd inst., of congestion of the lungs. Gen. McNiel was an officer in the war of 1812, in which he greatly distinguished himself for his bravery, and was severely wounded at the battle of Lundy's Lane.

For the Scientific American.

To Prevent Explosions.

In the first place, there must be a State Inspector or Inspectors of boiler iron, who are practical and scientific men, not carrying on the iron making business, to see that none but the best iron be rolled into boiler sheets. Then let every city and manufacturing town have a board of practical scientific engineers, who are not concerned in building engines or boilers as proprietors, to say how and where an engine and boilers may or may not be put up, and of what form and thickness the boilers shall be; allowing no one to have charge or run an engine, where lives are at stake, without passing the ordeal of the board of engineers, as a skilful and practical engineer, and a sober and attentive man. The boilers should be inspected every three months by a practical and scientific boiler maker, who is not afraid nor ashamed to go in and under them, acquitting himself of the obligation he subscribes to when accepting the office, and my word for it explosions will be few. Cadwalader Evans, a practical and scientific engineer, received the first appointment as United States Inspector of Steamboat Boilers, at Pittsburg, but the law placed him at the mercy of a chief judge of the court. When he protected the lives of our citizens, by condemning many boats or sets of boilers for one company, they had influence enough with the judge to remove him and have Major Wm. Wade appointed in his place, an honorable scientific engineer, but he did not like to make a sweep of himself by going in and under the boilers—as every conscientious man must do to fulfil his obligation, so he vacated, recommending Wm. McClelland, a practical boiler maker, who still holds the berth, giving satisfaction to nearly all parties, although, when he emerges from the furnace, you might not think that ingenuity, conscientiousness and moral principle could condescend even for a brief period, to be literally covered as a sweep from the chimney.

In the brisk period of 1835, '36 and '37, I was principal in the locomotive boilermaking for McClurg, Wade & Co., at Pittsburg; I then hesitated not to tell them, in 1836-7, that I did not believe that there was scarce any boiler iron made in Pittsburg, at that time, fit to make a boiler of. My reason for such conclusion was, I could not find any of the promiscuous sheets on hand, rolled for plain cylinder boilers, that would stand a flanch being turned upon it, even with the greatest care, though I have turned thousands of flanches in my day, without breaking or cracking. I then had to order the iron to be made, especially for our purpose. The great demand for boiler iron at that time, was the cause of its inferior quality. In the Cincinnati rolling mills at that time, men were known to stand with loaded pistols to protect the sheets as they came from the rollers, such was the competition.

THOMAS CHAMPION.

Music in Man.

The universal disposition of human beings, from the cradle to the death-bed, to express their feeling in measured cadences of sound and action, proves that our bodies are constructed on musical principles, and that the harmonious working of their machinery depends on the movements of the several parts being timed to each other, and that the destruction of health, as regards both body and mind, may be well described as being out of tune. Our intellectual and moral vigor would be better sustained if we more practically studied the propriety of keeping the soul in harmony, by regulating the movements of the body; for we should thus see and feel that every affection which is not connected with social enjoyment, is also destructive of individual comfort, and that whatever tends to harmonise, also tends to promote happiness and health.

Amount of Conversation Calculated.

The Rev. Mr. Gannet, of Boston, reckons that each individual averages three hours conversation daily, at a rate of a hundred words a minute, or twenty pages of an octavo volume in an hour. At this rate we talk a volume of 400 octavo pages in a week, and fifty-two volumes in a year.