ATMOSPHERIC ELECTRICITY AS A MOTOR.

MESSRS. EDITORS:—In "No. 1, Vol. I., New Series," of the SCIENTIFIC AMERICAN, there appears an article under the head of "Lightning Batteries—Remarkable Invention." Under that head you say that M. Hippolite Charles Vion, of Paris, France, has invented and patented certain contrivances for bringing down, from the atmosphere, natural electricity, to be used as a power for various purposes, and that in level countries it is to be brought down with a balloon and conducting wire. As I claim at least priority of design, if not of doing the thing satisfactorily (although I have brought down electricity profusely with a six-feet diameter balloon without a metallic conductor), permit me to say how far my claim stands the proof of record.

In the summer or Fall of 1857 I wrote to Professor Joseph Henry, the Secretary of the Smithsonian Institution, about it, and my wish of having it tried with a large balloon to go a mile or two up with metallic tractors and conducting wire. On September 26, 1857, Professor Henry answered me (in part) thus:—"It is a fact, established by abundant experiment and observation, that the difference of electrical intensity between the surface of the earth and the atmosphere increases as we ascend in the latter. If we were to suspend a copper wire to a balloon, the lower end of which is insulated at the surface of the earth, the quantity and intensity of the electricity which would be given off from the lower extremity would increase with the elevation of the balloon, though the law of the increase with the elevation is not yet known. I doubt whether a sufficient quantity of electricity, for practical purposes, could be obtained in the way you propose. The electricity of the atmosphere, though greater in intensity, is very small in quantity, according to the experiments of Faraday, Pouillet and others. I would not wish, however, to discourage your experiments. It would give me much pleasure to see you in Washington, and to have a long talk on the subject of atmospheric phenomena," &c.

In April, 1858, I made my visit to Washington accordingly, having now got privilege of a personal conversation with a philosopher in whom I had more confidence as to solid truths yet undeveloped than any man living. I passed over a day with Professor Henry, and after stating to him all I knew about storms and atmospheric phenomena, so far as I understood it and saw and experienced it, I made the proposition of building a balloon expressly for the electrical experiment, provided the Smithsonian Institution would furnish the gas, wire, rope and other instruments, and direct the experiment; and to this Professor Henry at once agreed. This balloon was built last summer, and we had arranged for the experiment in August or September of 1858; but business pressing upon Professor Henry in bringing out his "Report," and other matters, we deferred the thing for this summer. The balloon is still on hand, and is labeled "*Smithsonian.—Pro Scientia et Arte.*" I made an ascension in that balloon on the 14th ult., and noted some remarkable atmospheric phenomena, which were at once submitted to Professor Henry. In the acknowledgement of my report, Professor Henry says:—"I shall probably have a few weeks' vacation this summer, and would be pleased to make some of the experiments with you which we contemplated last summer. Please inform me when it would be most convenient for you to meet me." When I received this cheering news from Professor Henry, of readiness to try this experiment, I was busily engaged in getting things ready for the great trans-continental trip from St. Louis to the Atlantic seaboard in the balloon *Atlantic*, furnished by Mr. O. H. Gager, of Boston, and with whom I had entered into a contract for the directorship of that enterprize. Since that time I have written to Professor Henry, and am awaiting his orders to proceed to Washington with the balloon *Smithsonian*, to put the matter under trial.

If Mr. Hippolite Charles Vion has already made this thing practically demonstrable, *i. e.*, using it for the purposes designated, then I am too late for the uses of the patent. If, like myself, he only *thinks* it will subserve these purposes, then I claim priority for my own country. It often happens that two or more persons are pursuing the same investigations without knowing of each other's efforts, and this is certainly the case with me so far as the French experiment is concerned. I have, for five years' past, corresponded with electricians in this country on the subject and on the resources of atmospheric electricity; but until the time above mentioned, I did not take the necesary active steps to bring it under test. I wanted a person to direct the experiments, and Professor Henry was the man I preferred above all others to be my guide and director in them. I proposed to him that this electricity could be brought down as *a great motor for all mechanical purposes*, that it would serve us much better than steam or water power, and at a comparative trifling cost. Irrespective of this, however, an electric-collecting balloon, suspended a mile or two above a city, would be a sure defense against electrical destruction or damage to that city.

JOHN WISE.

Lancaster, July, 1859.

[In addition to the above communication on this subject from Mr. Wise, we have received another from C. Kirchoff, of this city, in which he makes similar claims. He made the discovery a long time ago, and says he has tested it in the presence of witnesses. He also states that not only atmospheric, but *all* electrical currents, of whatever kind and character, may be stored up and afterwards used at pleasure, and be conveyed on a conductor to any distance. He has made many experiments of this character, and has had the apparatus in operation for several days without interruption. With such currents he once kept two telegraphs that he had on exhibition at the N. Y. Crystal Palace (in 1857) in continuous operation for more than an hour. The power which he thus obtained from the free storehouse of nature was equal to a Grove's battery of six cups. From the documents or M. Vion, however, we judge that he has given this subject attention for a number of years, and that he reduced his ideas to practice long ago.—EDS.

PLATING ON IRON.

MESSRS. EDITORS:—In my last receipts published on page 142, Vol. XII., of the SCIENTIFIC AMERICAN, was one for plating direct on iron, which would only stand dressing but not burnishing. I have since then succeeded in plating direct on iron, cast (grey), malleable, or wrought, and steel, so that it will stand the heaviest burnishing, rolling, or being brought to a blueing heat, without striping, by the following process:—The iron or steel to be plated must be previously pickled in clear muriatic acid, then rinsed in clean cold water, and plated for about 10 seconds (with a battery of at least three pairs) in the following solution: Dissolve 80 grains or chloride of silver in 32 ounces of cyanide of potassium, one ounce of chloride of potassium and one gallon of rain or distilled water. After receiving the first coating in this solution it is to be finished in the ordinary solution for plating brass, &c. I have plated a number of sewing machines, table knives, &c., without once failing.

Very respectfully,

RICHARD WOOD.

Newark, N. J., July 11, 1859.

THE PLEASURES OF KNOWLEDGE.

"How charming is divine philosophy!
Not harsh and crabbed, as dull fools suppose,
But musical as is Apollo's lute,
And a perpetual feast of nectared sweets,
Where no crude surfeit reigns."

So sung Milton two centuries ago, and long before that date Plato had announced that "the world is God's epistle to mankind." It is the grand book in which all may read, and whose pages are so full of varied interest and genial knowledge that the being who, having the power, neglects to study it, surely may be written down an ass, for he deprives himself of an enjoyment such as no other pursuit can give.

We are sometimes inclined to be vexed with our race when we find them all toiling after every vain fancy, some bent upon one ambition, some another, and but a minority digging in the deep mine of nature for the grandest of all possessions—Truth. Granted that its gold is not yellow, nor its silver white, for its treasures have not the color of material wealth, but they are as glorious and beauteous as the sparkle of the diamond and as enduring as the hills. Science clothes not her votaries in purple and fine linen, but dresses them in lovely flowers or in iridescent shells, and gives as her reward a contented mind and a pure soul. The poetry of science sometimes flashes in the oration of a professor or in the pages of a book, but her truest epic is written upon all materiality, which proclaims that in all things there is a law which, when known and applied, shall make man happier, better and more truly human.

By the investigation of the laws which govern the objects that are all around us, the motions of the planets, the relations of life and health, the destiny of man, and the glory of the Deity, are better understood; and the lighting of a cottage, the building of a palace, or the cooking of a dinner are better performed. We can never be in any position in which knowledge is not of value to us, and we can never prophecy the moment at which we may most require it. Indeed many of us only know that there is more to be known than occurs to us in the daily round of business life, by the discovery that something we do not know is calculated to make us richer or give us more ease. "But," exclaims many a petulant person, "how shall I study without an instructor, or how investigate without apparatus?" Foolish notions! the best workman always uses the simplest tools. Have you eyes, ears, nose and hands? Then you are provided with apparatus, and memory is the tablet on which to write down your impressions. Each one of us is better furnished than a college laboratory or a professor's lecture room, and all that we have to do is to learn the use of our apparatus; and there is no place in the universe where man cannot find some object to interest, some study to pursue. Goldsmith found time to observe nature and record his thoughts, and in glowing language he tells us that "the blushing beauties of the rose, the modest blue of the violet, are not in the flowers themselves, but in the light which adorns them. Odor, softness, and beauty of figures are their own, but it is light alone that dresses them up in their robes, which shame the monarch's glory." As a concluding incentive to our readers to study for themselves, as well as to read books and scientific periodicals, we will give a quotation from a lecture by Prince Albert of England. "Man," observes this eminent *savant*, "is approaching a more complete fulfillment of that great and sacred mission which he has to perform in the world. His reason being created after the image of God, he has to use it to discover the laws by which the Almighty governs his creation, and, by making these laws his standard of action, to conquer nature to his use—himself being a divine instrument. Science discovers these laws of power, motion, and transformation; industry applies them to the raw material which the earth yields us in abundance, but which becomes valuable only by knowledge."

Oh! that all would study nature more and think of themselves a little less; then we should indeed be a people of kings, whose empire would be the world and whose subjects would be all created things!

DIAMONDS IN THE ARTS.

It is not only for the purposes of ornament that diamonds are employed, they are most useful for some purposes in the manufacturing arts. Discolored diamonds are reduced to powder, and there are many operations for which they are indispensible. Fine cameos and some precious stones are engraved with the diamond. It is employed for cutting the glass for windows. The point used for this purpose is of a trapezoidal shape, weighs about the sixtieth part of a carat, and is usually set in a wooden handle. The edge is a natural one, and could not be given to it by art. From the high refractive power of the diamond, it is sometimes employed to form minute and exquisitely accurate lenses for the best kind of microscopes. In respect to the general operations of the lapidary or jewel-cutter, they could hardly be conducted without the aid of diamond-dust; for the usual mode of cutting and shaping precious stones is to hold them against a very small metallic disk or wheel, which is rotating with great velocity, and to moisten the edge of this disk with oil and diamond-dust. The exceedingly hard particles of diamond-dust enable the disk to cut the stone or jewel. The rays of light easily pass through other gems, but in the diamond they are refracted to the surface, and this refraction occasions its superior brilliancy.

OUR SEABOARD.—The line of coast belonging to the United States is very extensive. According to the report of the Coast Survey, there are 6,821 miles of Atlantic coast, 3,467 miles of the Gulf coast, and 2,281 miles on the Pacific, making a total of 12,569 miles. The main shore line of the Atlantic, including bays, &c., is twice the extent of the Gulf, three times that of the Pacific, and more than equal to that of the Pacific and Gulf combined. The southern States have three times as much sea-coast as the northern