

Imponderable Agents.—No. 1.
[Second Series.]

LIGHT.—Theory, in Science, is better, even when wrong, than facts without any arrangement: for, as Bacon has said in his own peculiar manner, "Truth is more easily evolved from error than from confusion." Thus premising, we will proceed to present a number of articles, of which this is the first, on "Light," "Heat," and "Electricity;" our attention having been more immediately directed to these questions by the series of articles which have recently appeared in our columns, on the "Imponderables." In a scientific sense, "light" is a term employed to denote that "substance," or "action," or "quality," of matter by which we are enabled to perceive and distinguish objects without hearing, feeling, tasting, or smelling. In a certain sense, Light is a matter of pure hypothesis, hence it becomes us to receive with caution the terms used by writers in referring to it: we can speak of Light as "reflected," "conveyed," "evolved," and "absorbed," and yet these terms are merely convenient modes of describing facts, and not really explanations of them; for all these terms are just as applicable to a "force," an "action," or a "motion," as to a substance. A "motion," may vary in intensity, and be treated like an arithmetical quantity, and may be propagated from place to place, and yet who would be so blinded to common observation as to say that "motion in itself is a substance?"

Light has been considered by Sir Isaac Newton as a distinct substance in itself, or else his language means nothing. Descartes' theory is, that Light is an action, or rather the quality of an action, namely, the property of the motions of a subtle "ether" pervading all space. The Cartesian theory embraces Light as a substance and a quality, and there is no room in philosophy for any other intelligent opinions respecting it. Euler, the ablest exponent of the Cartesian theory, is termed by Sir David Brewster—and justly we think—"the profoundest philosopher that ever wrote." In the articles which have appeared in our columns, both the Newtonian and Cartesian theories have been condemned, and a new one claimed. We will state the three, in order to discover what is new and what is old.

1. **DESCARTIAN THEORY.**—"All bodies and space are filled with a very light and very elastic "ether," much lighter than air, composed of small globules, the vibrations (motions) of which eliminate light, the different colors are the result of different vibrations."

2. **NEW CLAIMED THEORY.**—"In Nature there is an element existing in a form exceedingly more rare than the lightest fluids, which may be called an etheroid (etherform); it may be called "lumenism" (lightism). Light is lumenism in motion; the different colors in the spectrum are caused by the different motions of its particles."

NEWTONIAN THEORY.—"Light is composed of emanations, the particles of which are sent with great velocity from luminous bodies—such as the sun—to distant places; these particles are also possessed of inertia, and endowed with attractive and repulsive properties."

We do not know how many pens have been worn out by philosophers writing against the undulatory theory, on the one hand, and the theory of emanations on the other: but there is no difference between the two in essence; the only difference consists in the words employed by the reviewers of both theories, in darkening their own ideas, and the ideas of their respective champions. Both of these theories have been condemned in the articles which have appeared in our columns; if both are wrong, what place must we assign for the new claimed theory.

It is well known to philosophers how Leibnitz and Maclaurin, and their followers, disputed for thirty years about the true method of estimating the force of moving bodies, and to the no small disgrace of great mathematicians, the controversy was dropped not ended. It was at last discovered by D'Alembert that both were right, and that they had been hammering for years at one another with mere terms. The same may be truly said of the two theories of Light—the Cartesian and Newtonian—they

are identical, and we think we shall be able to show this clearly.

Euler adopted the theory of Descartes because his strong common sense could not allow him to adopt any other. This, as we have said, supposes all space filled with an elastic subtle fluid, the motions of which produce what we term "light." Well, what are Newton's emanations? "Fine particles of matter."—These particles in the aggregate must form a subtle elastic fluid—an ether—etheroids. What difference is there between this and Descartes' fluid? None. Again: if Newton's emanations are always being given off from the Sun and other luminous bodies, throughout all space, these emanations must fill all space. Is there any difference between this part of the theory and that of Descartes? None. What kind of a motion will be given to an elastic fluid, by a mechanical action impressed upon it? A vibratory motion. What difference is there, then, between the theory of emanations and that of undulations? None at all, excepting that Newton had not a clear idea of it, inasmuch as he considered that these emanations were shot from luminous bodies to distant places, in straight lines, with inconceivable rapidity, which, if it were true, would make our earth a sun in itself at some distant day.

By any view which we can take of the question, the Emanations of Newton must form an elastic fluid, and its motion must be vibratory—undulatory—the real Cartesian theory. We have a fine example of this in our atmosphere; the breath of the tiniest insect that floats within it, produces undulations; it is the same with water; the smallest pebble thrown into the sleeping ocean will produce undulations that will gently ripple the yellow sands at a thousand miles distance.

(To be Continued.)

President's Message and Inventors.

If we mistake not, a President of the United States has for the first time condescended to notice the inventors and men of genius of our country in his annual message. The following gratifying paragraph appears in President Pierce's first message to Congress, and although brief it is full of truth and should attract proper attention. "I commend," he says, "to your favorable consideration the men of genius of our country, who, by their inventions and discoveries in science and art, have contributed largely to the improvements of the age, without, in many instances, securing for themselves any adequate reward. For many interesting details upon this subject, I refer you to the appropriate reports, and especially urge upon your early attention the apparently slight, but really important modifications of existing laws therein suggested."

We copy from the Report of the Secretary of the Interior, the following, reserving our comments until next week:—

"The Commissioner of Patents, who communicates directly to Congress, will, at an early day, report the operations of his Bureau. By his indefatigable and unremitting exertions, system has been restored, and the business of his office is now conducted with much order and regularity.

The number of applications is constantly increasing, and the force, though augmented by the act of 1853, is still insufficient to bring up the old, and dispatch with promptitude the new business. As the public is so deeply interested in the speedy examination of the applications for patents, and the fund for this purpose is ample, every facility for dispatch should be afforded.

No complaint is heard against the integrity, skill, or competency of those discharging the important duties of the Bureau, but the delays incident to the smallness of the operative force in the office, are vexatious and embarrassing. Since the present Commissioner took charge of the Bureau, the number of applications examined, and patents issued, have greatly increased. Still from four to six months, and in many cases a longer period unavoidably elapses, after the application is presented, before final action can be obtained. This is a severe trial to the patience of the inventor, and often a serious loss to him, as well as the public.

The law requires the models and specimens

of unpatented inventions, to be preserved and arranged in suitable cases. Some of these are useful, as well to the inventors, desirous of ascertaining whether their inventions have been anticipated, as to the Examiners, in the discharge of their duties. But there are many that are worthless and unfit for any purpose. In some instances they represent contrivances altogether unpatentable; in others they are merely duplicates of models previously deposited. Where application is made for a patent for a design merely, the practice, under existing laws, has been to allow the applicant to deposit as his model a specimen of the article, on which his design has been placed, in its full size. Accordingly, a vast number of stoves and other cumbersome articles have accumulated to such an extent as to render it impossible to comply with the law requiring them to be arranged in cases.

As space is of so much value and importance to this Bureau, these defects in the law should be remedied, and a more enlarged discretion given to the Commissioner, there being no danger of its abuse.

Appeals from the decision of the Commissioner may be taken to the Chief Justice, or either of the Assistant Judges of the Circuit Court of the District of Columbia. It is optional with the applicant to which of them he will take his appeal, and the adverse party cannot have it decided by any of the others, although the judge to whom the appeal was made, may be unable, from absence, age, or other infirmity, to hear the case. The object of the appellant is to enable him to interfere with impunity upon the right of the appellee, and the law as it now stands, affords him this opportunity. As such cases have occurred and may again arise, the evil should be remedied."

"The Indian and Land Bureaus must be removed, and the only question appears to be whether the west wing of the Patent Office building shall be fitted up for the temporary accommodation of these Bureaus, or they be placed in rented buildings, not fire-proof, thus exposing to imminent peril papers of immense value to the General Government, the States, and private individuals. The building may be finished within a year, and until a suitable structure can be erected for this department, it will not be required of the Patent Office. Some opposition has been made heretofore to a somewhat similar proposition, but this, it is presumed, was based on the erroneous supposition that the cost of the entire structure had been defrayed out of the patent fund. The amount thus far expended and appropriated, is \$1,367,750, of which \$1,048,750 has been paid out of the treasury, and only \$319,000 out of the Patent fund. Such being the fact, there is no reason why a portion of it should not be temporarily used as proposed, until needed by the Patent Office. If this should even somewhat incommode that office, it would be of small moment in comparison with the evils that might result from withholding it from the Bureaus. Skillful artisans are of opinion that the necessary improvements can be easily made, without interfering with or injuring the original design. Unless Congress by express enactments otherwise determine, I intend to direct the completion of the West wing, so as to accommodate these Bureaus, and secure the public archives.

Within a few years the Patent Office will need the main building and the two wings for its exclusive use. In the mean time, a structure should be erected for this Department, and as it consumes much time to complete such a building, sound policy should induce its immediate commencement. One sufficiently large and commodious, and entirely separated from the other Department, can be constructed in a plain and substantial manner, for \$250,000, and in the most approved style, with all the modern improvements, for less than half a million. Surely, at this time, there can be no more proper or profitable application of the public moneys. The considerations enjoining it are strong and apparent, and, it seems to me, cannot fail to convince every one, who reflects upon the subject, of its absolute necessity."

The Humboldt.

This noble American steamship belonging to the New York and Bremen Line, was wrecked

last week on the coast of Nova Scotia, about 12 miles from Halifax, while on her way into that port for fuel. All the passengers were saved, and some of the cargo.

Early Manufactures of New England.

Fire arms were manufactured in large quantities in colonial times. Hon. Hugh Orr, of Bridgewater, about 1748, made 500 stand of arms for the province of Massachusetts Bay, which were deposited in Castle William; nearly all, however, were carried off by the British when they evacuated the town of Boston. Mr. Orr was a pioneer in many articles of manufacture in the old colony, particularly of iron. He erected the first trip hammer known in this part of the country. By his exertions and experiments, scythes and axes were first introduced, and for several years he was the only edge-tool maker in New England.

Powder was an article of much anxiety in regard to its manufacture. We find even as early as 1639, a record that Edward Rawson, who represented Newbury in the General Court that year, was granted by the colony "500 acres at Pecoit so as hee go on with the business of Powder if the salt Peter come." But he did not succeed, as in 1748 he is granted 500 acres to indemnify for his losses. "In 1643 the General Court made an order about preparing houses for saltpeter that there might be powder made in the colony, but as yet it has not gone on."

In 1775 Gov. Richard Penn, who was in England charged with a petition for redress from the Continental Congress, stated "that the Pennsylvanians perfectly understood the making of gunpowder, and also the manufacture of small arms." Probably the first powder mill erected in this part of the country was at Andover. It was built by Hon. Samuel Phillips, Jr., in 1776, and some remains of it are still to be seen. The colony supplied him with saltpeter and sulphur, and he was to receive eight pence per pound for manufacturing.

The resolve under which the contract was made, is dated June 8, 1776, and requires him to give bonds for the faithful performance of the contract; also, he was to cause to be published all the discoveries he might make relative to the construction of the mill and the manufacturing of powder. During the year 1776, that mill turned out 30,000 pounds of powder. In 1778 the mill was blown up, and after that time the manufacture was given up, and that of paper substituted by the same gentleman. Subsequently, about 1794, a smaller powder mill was erected, which was blown or burned down in 1796. This ended the manufacture in Andover.

Although but little had been done in manufacturing woolen and cotton articles previous to the Revolution, yet each family in the country supplied in a great measure their own wants. A woolen factory was erected at Ipswich, in 1792, and some blankets made, but, being a losing business, it was continued only a few years, and a cotton factory exhibited similar results.

[The above is from the "Boston Transcript," and relates mostly to fire arms and powder. By the Report of the Commissioner of Patents for 1852, we learn that the first cold cut nail in the world was made in America. This was done in 1777 by Jeremiah Wilkinson, of Cumberland, R. I., who is still living at a very advanced age. During the revolution he followed the business of making cards by hand, and finding great difficulty in obtaining a supply of English tacks to nail them on, he tried the experiment of cutting some with a pair of large shears, from the plate of an old chest lock, then heading them in a smith's vice. Finding this plan to succeed very well for his wants, he afterwards made all the tacks he wanted from sheets of iron. Subsequently he made larger nails, such as those used for fastening laths and shingles. This veteran inventor also made pins and darning needles of wire drawn by himself. He is a Quaker, and followed the peaceable trade of fighting iron, while others of his countrymen were fighting their foes. He, however, has not labored in vain for his country, as he laid the foundation for vast improvements in cutting nails by machinery, which is exclusively an American Invention.]