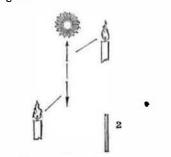
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Imponderable Agents .--- No. 4. [Second Series.]

LIGHT-UNDULATORY THEORY.-The Abbe Moigno, of France, author of an excellent work on telegraphs, and editor of a scientific periodical (Cosmos) Paris, has published a paper on his experiments with Noberts' plates, which fully confirm the undulatory theory. "M. Nobert," he says, "a German optician, has succeeded in tracing upon a surface of polished glass, perfectly parallel lines, the distance apart of which is only the five-thousandth of a millimeter (0.000008 inch) the length of a wave of light, and has desired to make his marvellous skill subserve the triumph of the undulation theory. For this purpose he has executed three plates, which were sent to us by M. Albert, of Frankfort. We immediately appealed to the optical resources of M. Jules Duborg, and the skill of M. Natchet in microscopes, and with the German instructions in hand we repeated the fundamental experiments ; they have fully satisfied us; they are the true touchstone of the optical theories.

In the center of a quadrangular strip of glass are traced seven groups of equi-distant parallel lines; the lines of each group are equally spaced; the different groups are separated from each other by a greater interval; in passing from one group to another, the distance of the lines apart augments, and the seven distances are proportionate to the wave-lengths of the seven principal colors of the spectrum; violet, indigo, blue, green, yellow, orange, red; the following are the distances expressed in millionths of a Parisian line; 1st group, violet, 900; 2d, indigo, 1000; 3d, light blue, 1075; 4th, green, 1188; 5th, yellow, 1325; 6th, orange, 1450; 7th, deep red. 1.600.

When these seven groups have been traced upon the plate, it is covered with a very thin protecting slip with parallel faces, and there is engraved upon this slip with the point of a diamond, a star, a double arrow, and a double candle with its flame, as is shown in the accompanying figure.



To observe, we take a microscope magnifyboiling them in a bath of chemic-hyposulphite decomposition of water. premises necessary, whilst all existing pipes ing from 16 to 27 times; if the lenses have not, of indigo. The exact quantity to use cannot The gases of water are not fit for illuminaand lamps may be used if requisite; and in the like those of the French microscopes, a very be given; care and a little experience will ention, unless burned on lime or chalk, forming economy of production there will be a saving small diameter, a small disk of blackened metal able any person to use the proper quantity for the Drummond Light. This light is very exof at least 50 per cent. upon the present cost of pierced with a small hole, is placed in the any amount of goods. coal gas. pensive and troublesome. The gases of water mounting of the objective; the plate is placed cannot be conveyed and used in pipes like our Mr. Gamble, a scientific gentleman connected on the table of the microscope, with the arrow Rotary Winds. common carburetted hydrogen, nor can they with gas works and railways, has made a repointed towards the light (the best of all lights It is well known that there has been considbe used with safety. A jar containing hydrois that from a white cloud); between the mirreport on this electric gas, in which he says :erable disputation among scientific men respectgen and oxygen in the proportions for forming ror and the light is erected five or six inches "I cannot find language sufficiently expresing the correctness of Prof. Redfield's theory of water, will explode with great violence if a sive to convey the astonishment I experienced from the mirror, a screen pierced with a horirotary hurricanes. The "Salem (Mass.) Regisspark of electricity be passed through it-these zontal slit six inches long and one-third of an ter contains the statement of Capt. Upton, of at witnessing the effects of the electro-magnetgases will also explode if a light of any kind nch wide, which throws the light upon the the bark "Argentine," which appears to have ic machine in the production of gas applicable be applied to them. for the purpose of artificial light and heat by side of the mirror corresponding to the flame a bearing upon this theory of storms, and will The statement above, that the gases of waengraved upon the plate; while looking through be interesting to the scientific world : the decomposition of water. Water is found, ter "are free from all possibility of explosion," the eye-piece, the mirror is gently turned, and "On the 25th of November, latitude 26° N. on a chemical analysis, to be composed of two is an unqualified untruth, and so is all that is permanently elastic fluids, or gases called oxlongitude 60° 30' W., the wind being S. S. W. soon seven colored bands or seven flat or uniygen and hydrogen. When water is decomstated about its cheapness of production. These at the time, the barometer commenced falling form tints appear in the field of vision, repregases can be safely burned by well-known apsenting the sevenl colors of the solar spectrum very rapidly, near sunset, and continued to fall posed, an enormous increase in volume is the paratus made for the very purpose, still they result; this increase is about 2,000 times. It separated by dark very distinct and very bril- till it went as low as 29 inches. Being satisfied are dangerous. They produce, when burned, hant intervals. The plate may be placed in that we were in the vicinity of a hurricane, we has been long known that water is decomposan intense heat; a heat so great, indeed, as to two different ways on the table of the micro- began to shorten sail immediately; and, at able by electrical agency, but this has been gemelt platinum like wax, by Dr. Hare's blownerally effected by the action of a galvani e; with the protecting plate either above nidnight hove to, head to the westw pipe, but unless burned upon lime or some solor below. In the first position, the interferenclose-reefed maintopsail-blowing very heavily, trough, at an expense so great as to be commercially prohibitory. But by the magnetic id incandescent substance, as we have already ces which produce the colors, evidently take accompanied with the most vivid flashes of stated, they will produce only great heat, but apparatus the expense is very trifing, being litplace in the sheet of air between the plate and lightning from every part of the horizon, withnot good light. In the above extract which tle more than interest on first cost of the maits cover, and the spectrum produced may then out intermission-so much so that the whole we have quoted, there is nothing new except be called the air spectrum; in the second posiheavens appeared one vast sheet of flame. At chine, with a small addition for renewals, and that which is untrue. the cost of the motive power. The decompotion, the interferences take place in the glass. noon of the 26th took in maintopsail-barometer many (_9.30-the wind backing round to sition of water for the purpose of obtaining a and the spectrum is the glass spectrum. Now, Fine Cotton. gas applicable for the production of artificial observation shows that these two spectra are N. W. by the eastern board. The Augusta (Ga.) Constitutionalist chronicles light and heat, has long engaged the attention At midnight wore ship to W.S.W., set the completely identical, that the colors are exactly the sale in that city of a lot of 17 bales of cotton the same, as they ought to be according to the of chemists, and numerous discoveries professclose reefed topsails and foresail, weather still at 11 cents per pound. It was from Oglethorpe moderate-almost calm-till 4 A. M., 27th. ing to attain this desideratum have been made. theory of undulations, which thus receives a All these, (so far as I am acquainted with county. We have a higher figure than that, and simple and striking confirmation. when the barometer began to fall, as before, them) have for their object the separation of in Georgia cottons also: two hundred bales from OOLORS .- It is very different to explain the till it again went to 29. Took in the topsails Green county were sold at 12 cents ; the cotton phenomenon of black bodies; strictly speaking, and foresail, and hove to under main spencer the hydrogen gas only; no attempt, I believe, was very superior, both in color and staple. there may not be a black substance in nature. and a tarpaulin in the mizzen rigging-blowing has hitherto been made to make use of the ox-2))

with ink upon a sheet of white paper, and then examine that line through a common magnifying glass, no black line can be seen, but instead of it three bands of color, complising the three primitive colors in a ray of light. Figure 2 represents this phenomena, the right line is a deep indigo blue, at the side of it is a light blue band, on the other side is the red, and on the other the yellow ray. Any person can perform this experiment, and by the aid of a pen, a sheet of paper, and a magnifying glass, behold all the colors of the rainbow displayed by a line of black ink. Every black line, on a printed card, having a white ground, if viewed through a magnifying glass glows with all the beautuous hues of the solar spectrum. Sir Isaac Newton's philosophy of colors comprised seven distinct colors in a ray of light; but Dr. Hay, of Edinburg, or Sir David Brewster (the credit, we are told, should be divided among them) made the discovery in 1823, that there were only three colors in a ray of light, namely, blue, red, and yellow. Practical men knew long before this fact was announced, that there were only three primitive colors in nature, and the writer of this, before ever he saw Brewster's account of the matter, was well acquainted with the fact. A black body appears to nullify the rays of white light, not absorb them. or else it should become luminous. In all likelihood the effect of a black color (it is convenient but not philosophical to call black a color) in a body, is caused by the fineness of the subdivided parts of the body; this is the opinion of Prof. Horsford as set forth in his paper read before the American Association for the Advancement of Science. Be that as it may, a black color can be produced, by the primitive colors of a ray of light being made to over-lie one another. Thus if a piece of fine white woolen cloth be dyed a deep yellow in a bath of quercitron bark; then dyed on the top of the yellow a deep red, in a bath of cochineal; then dyed on the top of the red, a deep blue in a bath of the hyposulphite ot indigo a beautiful black will be the result. The piece of cloth must be well washed out of every bath; the chloride of tin is employed as a mordant or the yellow, and tartar and the chloride of tin is employed as a mordant for the cochineal. Silks and woolens of a vellowish color are whitened by passing them through baths containing a dilute solution of red and blue coloring matters. The method here described of producing a black on woolen cloths may be valuable to many of our readers. Scarlet and red cloth can be changed into jet and blue black by simply

If we take a pen and make a single black line with inconceivable fury. The sea was thrown ygen. The general mode in which the hydrointo the most violent agitation, on account of the rapidity with which the wind changed. which caused it to tower up in a conical shape truly terrific! The wind continued to haul to the southward till the morning of the 28th. when it again reached S.S.W., the point from whence it started-thus making a complete circuit of the compass. It now began to moderate, the barometer remaining the same, and being fully convinced that we had passed from the southern edge to the center, where we were becalmed, and that by continuing our course N.W., we must again cross its track, I thought it advisable to keep the vessel's head to the southward-as recommended in Prof. Redfield's treatise, and making sail stood S. E. thirty miles, when the mercury began to rise immediately and it cleared up. Had we not pursued this course, I am satisfied that we should again have encountered the hurricane in all its fury.

Scientific American.

During the heaviest part of the storm, the mercury "danced up and down" in the barometer three-tenths. The circular or rotary course of this hurricane is palpable enough to convince any one of the soundness of the theory which I believe Prof. R. was the first to promulgate."

[The rotary theory of storms we believe is correct. We know that all the severe storms which take place around New York are rotary. To this we have paid particular attention during the past few years, and have never seen it fail in a single instance. There is one other feature about the storms which take place in this vicinity and which demands more attention, namely, severe storms most generally take placeduring the hours of night. _t commences to blow generally between 7 and 8 P. M., and continues more or less violent during the whole night, then moderates when the day dawns.

Electric Gas.

The proverb says, "There is nothing new under the sun ;" we have been led to doubt the truth of this from having witnessed a private exhibition of "electric gas." That is, gas produced from water by means of electricity, and by which is developed, for the first time, the extraordinary phenomena of burning the two gases together, without the least fear of explosion, which the most scientific and learned of men have ever hitherto deemed an impractica bility.

The gases produced by electricity are free from all possibility of explosion. Its production requires no expensive materials, nor are large

gen is obtained is by passing steam through scrap iron, or a variety of other materials heated to a high temperature; in this manner the vapor of water is decomposed, the oxygen unites with the heated solid body, and the hydrogen is liberated in the gaseous form, and collected in a gas holder. But the gas resulting from the decomposition of water by the magnetic machine is altogether different. Here is collected not merely the hydrogen, but the oxygen also; this increases the volume of production onethird, and the gas is altogether different in its composition.

It is an invention, the most gigantic of the age of wonders."-[London Mining Journal.

[The above is a very long quotation, and we would not republish it unless we thought of accomplishing some good thereby. We will therefore point out the errors contained in it, and show the utter unscientific qualifications of its author, who is reported to be "a scientific gentleman." And we do this as a duty, be-. cause we have seen the above republished in many of our exchanges, and we certainly do not wish nonsense to go abroad uncorrected under the panoply of science.

It is well known to almost every child in our land, that water is composed of hydrogen and oxygen; and when decomposed into these elements, they increase in bulk about 2,000 times their volume-as water. But it is not true that water has generally been decomposed heretofore, by passing steam through red hot scraps of iron, by which process the hydrogen is set free, while the oxygen unites with the metal. Zinc and iron, submitted to the action of dilute sulphuric acid, will generate hydrogen by decomposing the water : but platinum heated to a white heat, if plunged into water, will set both its oxygen and hydrogen free.

But water has been decomposed into its elementary gases, many times by the very plan set forth above, namely, electricity. This was Paine's plan of decomposing water to obtain his light. It is more than twenty years since this was first done by the Magneto-Electrical machine of Mr. Saxton, a scientific American residing in London: he accomplished the very thing said now so be "the most gigantic invention of this age of wonders," and in the very city where the above affair has been thus unblushingly announced by a scientific gentleman. In 1838 Dr. Page, formerly of the Patent Office, made a great improvement on the Magneto-Electrical machine, by which powerful currents were generated, perfectly applicable to the