

**Ozone—What is it?**

Ozone has been the subject of much observation and discussion, during the past few months; but as is unfortunately often the case, no new light appears to have been thrown on its true nature. Permit me, in a few lines, to trace its history, and to give to your readers some new ideas that have presented themselves to me concerning its cause and effects.

This gas, discovered by Van Maurum, in 1785, while passing a succession of electric sparks through a tube filled with oxygen, and remarked for having an odor like garlic, remained unnoticed till 1840, when Schonbein, a Professor at Basle, celebrated for his discovery of explosive cotton, perceived that, in the decomposition of water by a voltaic pile, the oxygen gas disengaged at the positive pole had the same odor as that remarked by Van Maurum, and perceiving also, that this gas had new properties, gave it the name of ozone, from the Greek word for odor. After a series of experiments, Schonbein concluded that ozone was oxygen modified by electricity, and stated that its principal properties were to dissolve mercury and silver at ordinary temperatures, to decompose iodates, to combine directly with nitrogen in forming nitric acid, and to cause peroxyd of lead; thus fulfilling the role of the most energetic of agents.

This curious gas may be obtained in three different ways:—

First, by collecting the gas disengaged at the positive pole of a galvanic pile while decomposing water, with conductors of platinum or gold.

Second, by placing in a vial, partly filled with water, a piece of phosphorous, so that a part shall be in the liquid, and a part be exposed to the air.

Third, by filling a glass jar with oxygen, and allowing the passage of several sparks of electricity.

Nothing more was made public concerning this element or gas, (for chemists, because of its resemblance to oxygen, and its phosphoric odor, hesitate to distinguish by the name of element) till the year 1854, when several scientific celebrities, among whom Becquerel occupies perhaps the first rank, after some deliberation, gave it as their opinion that ozone was simply electrified oxygen, and this is, I believe, the opinion still held by the majority of chemists at this date. What the word electrified oxygen means, is to me, and I have reason to believe with many others, an enigma.

During the search for a clear and definite explanation of this word, a few ideas presented themselves to my mind, which I think satisfactorily clear up the mystery concerning the nature of this gas, and as they may prove so to others, or at least be of service as an inkling for the explanation of some other development, I give them here.

If we consider matter as inert, and its motion a consequence of Divine will, we may conclude that its apparent qualities, depend upon its greater or less division, and its different movements; and also I think, that as the chemical elements, differ in their properties, they do also in their atomic division. As far as our senses are capable of perceiving, the size of atoms increase or diminish in regular order, so that they form, as it were, a ladder of progression. This being the case, how easy it is to conceive that the different properties of the chemical elements, arise from the difference of the size of the atoms composing them the most electro-positive; for instance, containing the grossest, and the most electro-negative, as oxygen, containing the finest. The atoms contained in any element must be of different size, if solely for the reason that there does not exist in nature any two equal things.

Now, if we subject any element to the undulations of heat, light, or electricity, is it not natural to suppose that those of heat which are the largest, will disengage the grossest atoms, and on the other hand, that those of electricity, which are the finest, will disengage the smallest. For an example, take oxygen. To extract this gas, we heat an oxyd, and by means of the undulations of heat, are enabled to disengage some of the grossest

parts of oxygen, but if we take water, and by means of electricity, the finest in its undulations, we disengage a gas, it is still oxygen; but finer in its atomic division than that obtained by heat, and instead of being called oxygen electrified, should be known simply as oxygen rectified. Ozone (or as I conceive it, oxygen rectified,) appears to be the true supporter of animal life, and will, I have no doubt, eventually prove the best of remedial agents.

I have, for sometime, been of the opinion, that to ozone alone should be attributed the cause of that increase of vigor, and vitality, that one experiences after taking electro-chemical baths, for in them the patient holds the positive pole, and becomes penetrated by it.

How sensibly we feel its delightful effects, when the lightning of a summer's shower has converted the oxygen of the surrounding atmosphere into this finer gas! Its imbibition gives us new energy, and it is a well known fact, that during the periods when the earth has not been visited by thunder and lightning, fevers and pestilences have been prevalent, and on the other hand that lightning has the effect of dispelling malaria, and giving tone to the general health. M. VERGNES.

[The views of our correspondent respecting the nature of ozone, are certainly original. The opinions he expresses regarding the invigorating nature of ozone, are the very opposite of those that were widely propagated a few years since. Cholera was then attributed to its presence in the atmosphere, and so was the yellow fever.]

**Cast-Iron Sleepers for Railways.**

The following is from the Lancaster (Pa.) Express, and refers to the cast-iron sleepers which were illustrated in No. 12. The article of the Express deserves attention, and some comments from us, which we present below:

"In the SCIENTIFIC AMERICAN of last week there is a very interesting description of an invention by H. Greaves, of England, with a correct figure annexed, representing his cast-iron sleepers for railroads, and stating that four hundred miles of railway have been laid down on various roads in France, Belgium, and England, which have been perfectly successful. The editor of the SCIENTIFIC AMERICAN copies from the London Engineer the following:—

"A permanent way of cast-iron has been attempted a number of times, and by various persons, always resulting in a failure; one, therefore, said to be successful, must be of interest to every railroad company in the world, because the material is almost indestructible, as it does not decay like wood, and therefore does not cost such immense sums for constant repairs."

Mr. Greaves, of England, "of course," receives much credit for his invention; but we are pleased to state that he is not the original inventor.

Some eight or nine years ago, Mr. Peter Getz, of this city, invented a railway of cast-iron, identically the same improvement now credited to Mr. Greaves, of England, which was a solid casting of sleepers, ties, and chairs. Mr. Getz exhibited his invention to a number of railroad officials, but as he was not considered anything else but a Lancaster mechanic, the self-important engineers on our public works expressed their opinions against the invention, and that it was of no practical utility. Notwithstanding their counter ideas of usefulness, he was persuaded by some of his friends to send his model to Washington and make application for Letters Patent of the United States, with the hope that some railroad company might, at some future day, think proper to test and adopt his invention. In a few months afterwards he received the following from the United States Patent Office:—

Sir—Your application for Letters Patent for alleged improvements in the chairs, blocks, &c., of railroads has been examined and rejected for want of novelty. (Signed)

EDMUND BURKE,  
Commissioner.

No patent had ever been granted for the same improvement to any one else, and consequently there could be no interference with any other patent; yet the opinion of the ex-

aminer of the Patent Office was to the prejudice of Mr. Getz, because he (the examiner) could not comprehend its utility, and the worthy inventor's skill, labor, and money were all lost, "for want of novelty;" but now we see that four hundred miles have lately been laid down in France, Belgium, and England, which have been perfectly successful.

We are disposed to believe that the business of the Patent Office has not heretofore been properly conducted; and we do contend that, whenever there is no interference with another patent, the Patent Office has no right to reject the application of an inventor for Letters Patent. The mere opinion of the examiner, because he does not comprehend the utility or novelty of the invention, should not be used against the rights of the inventor. Such decisions have, in numerous instances, proved most disastrous to the worthy inventor, disheartened and prostrated his best efforts, and they certainly retard the progress of the arts and sciences. We do sincerely hope and trust that the Patent Office officials will hereafter encourage and not disparage the inventive genius of our country."

[The comments of our cotemporary in relation to the action of the Patent Office, as shown in the letter of Commissioner Burke, are perfectly legitimate. The patent law of 1836 provides, in Section 7, for reasons and references to be given for the rejection of every application for a patent. The above letter does not comply with the provisions of this law.]

The Patent Office is better managed now than it was nine years ago, and if Mr. Getz were now to make application for a patent he would not be rejected by the simple *ipse dixit* "want of novelty."

We do not know the specific nature of Mr. Getz's improvement in railroad sleepers, but neither he nor Mr. Greaves are the first inventors of cast-iron sleepers. They were proposed twenty years ago by Mr. Reynolds, in England, and it is ten years since (1846) since Mr. Greaves first introduced his sleepers. But it requires time and experiment to test the value of any invention of this kind, and we therefore presented the engraving of Mr. Greaves' sleepers, with a portion of his letter, which appeared in a recent number of the London Engineer, to show our railroad engineers the opinions of its inventor after it has been tried for a number of years.

A city cotemporary, in a fussy attempt to be superlatively smart on all railroad matters, criticized our remarks on the sleepers referred to, and entered into a long rustic rigmarole quite foreign to the question, about stone sleepers, and their unfitness for railroads.—The language we employed respecting them was not so favorably strong as that used by that great authority in such matters, D. K. Clarke, C. E. He says: "There are several advantages in this system (referring to these sleepers): the form of the sleeper is strong; it holds well in the ground; the chair is not liable to be detached; the whole bearing surface is directly beneath the load, and the ballast is always kept dry and elastic."

**Scarlatina.**

A member of the Massachusetts Medical Society sends to the Boston Transcript the following remedy for this much-dreaded disease, which is now prevalent, and very fatal in many places:—

"Nothing less than a desire to save life urges me to address a few words to the public upon this terrible disease. Last week there were no less than twenty-five deaths by Scarlatina in this city. While the epidemic is so prevalent and fatal it seems very important that attention should be called to the prophylactic virtues of *Belladonna*. That these have been so little known and acknowledged I must think is owing to its having been first brought forward as a specific by Hahnemann, the father of homœopathy, it being thus looked upon with distrust from its connection with this system. Many eminent physicians, however, who entirely reject homœopathy, have published their opinions in its favor, and there exists an amount of evidence abundantly sufficient to establish its efficacy.

Moreover, the remedy is cheap, safe, and comparatively harmless. Nothing more is

requisite than a tumbler of water containing four or five drops of Belladonna tincture, if obtainable, if not, about two grains of the extract, perfectly dissolved. Of this an adult may take a teaspoonful, a child a half or a quarter as much, according to age, repeating the dose every four or five days while the epidemic is in the neighborhood, or every day, if there be any known exposure to it. The quantity taken should be less, if it causes dilated pupils, irascibility, and disturbed sleep. It is a mistake to suppose that this use of Belladonna will always prevent Scarlatina. It only modifies it, as a general rule, and destroys its malignancy. But so effectually does it do this, that in not less than 200 or 300 cases of apparent exposure to the infection where I have given seasonably of the Belladonna, I have never known one fatal case to occur."

**Scarlet Fever and Small Pox.**—Having much experience in the cure of scarlet fever and small pox of the most malignant type, I would thank you, for the sake of humanity, to publish a recipe, which, if faithfully carried out, will cure forty-five cases out of every fifty, without calling on a physician:—

**Scarlet Fever.**—For adults give one table-spoonful of good brewer's yeast in three table-spoonsful of sweetened water, three times a day, and if the throat is much swollen, gargle with the yeast, and apply yeast to the throat as a poultice, mixed with indian meal. Use plenty of catnip tea, to keep the eruption out on the skin for several days.

**Small Pox.**—Use the above doses of yeast three times a day, and a milk diet throughout the entire disease. Nearly every case can be cured, without leaving a pock mark.

Dr. WM. FIELDS.

Wilmington, Del., December, 1856.

**The Moon's Rotation—Completed.**

The Editors of the Vermont Chronicle, in criticising an article in our columns on the above subject, attribute to us a belief in the opinion that the moon has no rotation on its axis. They volunteer a few instructions for our enlightenment, but in doing so they show themselves unacquainted with our views "uttered and unexpressed," and not only this, but the real question itself. They use the terms "looking north, south, east, and west," as the moon revolves around the earth, in explaining its motion, but this is all moonshine. We have drawn attention, occasionally, to the fierce controversy waged on this subject for more than a year past, in the London papers, and have rather ridiculed both parties, (as did Mr. Conger in a former number,) distinguished though some of the controversialists are as astronomers. We have refused to publish numerous communications sent to us on the subject for reasons given in a former number.

That the moon has a rotation, *per se*, on her axis, as she journeys with the earth around the sun, no one can doubt who is at all acquainted with mechanism and astronomy. Every revolution which she makes around the earth is also a relative rotation on her axis. The term "revolution of the moon around the earth" always conveys to us the idea of a rotation on her axis in its course around the sun; but the terms "the moon's axial rotation and sidereal revolution round the earth," as employed in works of astronomy, convey the idea that the moon has also an independent motion on her axis, combined with its motion of revolution around the earth. This motion should be like that given to the ball of an engine governor, if the arm which connects it to its vertical spindle were rotated by a pinion once during its revolution round its spindle. If it received such a motion it would not always present the same face to its center of revolution—like the moon to the earth. It would then have a motion of all the particles on its surface continually traversing its path of revolution, like a rifle bullet whistling in its flight.

Some contend—and with apparent good argument—that the term "axial rotation" should only be used in regard to a body in motion which changes its side to the center of its path.

Our foreign cotemporaries contain many notices, lately, of the increase of the metal alumina, and a great reduction in its price.