SCIENTIFIC MUSEUM.

Oxygen.

This substance is indispensable to all vital activity, and yet most mysterious in its actions and effects. In a quiescent state it forms part of the solid muscle, which, if unattacked by outside chemical agents, would endure as long as the granite rocks; and yet, strange to say, it is another portion of the same element, in an active state, which constitutes the outside chemical agent by whose action the muscle is decomposed, and made one of the most shortlived of organic compounds. Again, oxygen is indispensable to all manifestation of animal or vegetable life, and yet the process by which it brings out such manifestations, is purely one of decay and dissolution!

Oxygen gas constitutes 21 parts in 100 of the air we breathe. It was, when first discovered, called vital air. It also constitutes eight-ninths, by weight, of water. In every nine pounds of water there are eight pounds of this gas, very much condensed of course, because it has taken on the fluid state.

Carbonic Acid.

When coal, wood, or other substance containing carbon, is brought to a very high heat in the presence of oxygen, combustion, that is chemical union, ensues. The two materials combine; heat, light, motion, and electricity are evolved during the process; and the product is another colorless gas, which is carbonic acid. This gas is proved to be an acid by its pungent taste, its effect in changing a vegetable blue color to red, and by its combining with alkalies and other oxides forming some of the class of compounds called salts. The diamond being nearly pure carbon, burns up, producing this acid gas.

In chemical union, bodies combine only in certain fixed proportions, or given weights. Thus, 1 lb. of hydrogen always combines with 8 lbs. of oxygen, or with twice that weight. So, too, with 14 lbs. of nitrogen, 8, or 16, or 24, or 32, or 40 lbs. of oxygen combine, but no quantities between these. The lowest weights in which these bodies united are termed their combining numbers, or equivalents.

The equivalent of oxygen is 8, that of carbon, 6.

Now in the formation of carbonic acid, we find one equivalent of carbon united with two of oxygen. Hence the symbol for this gas is CO^2. Thisis the gas which is emitted by the respiration of animals, volcanization, and it exists solid in many of the metal ores.

Red River.

Capt. Marcy has been on an exploring expedition to the head waters of Red River. He has followed the North Fork, the Middle and the South Fork of the Red River to its source, about forty miles from Anton Chicot, in New Mexico.

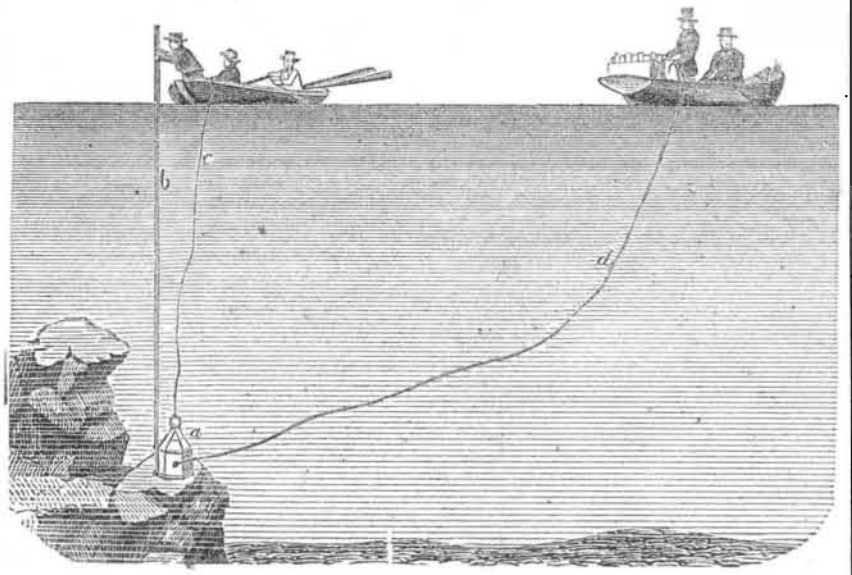
In some places he found the South Fork a river half a mile wide, but partaking very much of the character of the Platte—shallow, with a sandy bed, and much of it, except when high, uncovered by water. For two hundred and fifty miles from Arbuckle, west, the country is represented as the finest in the world for farming purposes. The land is well timbered, with oak, pecan, and other fine trees; the atmosphere pure and healthy as the mountains of New England, and inviting the emigration of the white man. Very soon they will be found there.

Game of every kind is abundant, and the command had excellent sport in killing bears, panthers, antelopes, buffaloes, &c. The water of the Red River, in parts explored by this expedition, has been condemned on account of its salty taste, and it has been generally supposed that there were large beds of salt towards its sources, but this is found not to be the case. The presence of gypsum, in large bodies, high up the river, is supposed to give to the water this peculiar flavor, as above these points the water is very pure and agreeable.

Rare Curiosities.

Purser Ramsey, of the U. S. Navy, has recently brought from Brazil a number of very elegant head-dresses for ladies, which, in their material and fabric, may justly claim a place among the curiosities of the age. Many of them are made of the scales, eyes, and bones of fish, in the form of flowers, beautifully arranged into wreaths and boquets, while others are made up of the feathers of birds of the most brilliant plumage, rivalling the hues of the far-famed birds of Paradise. Several of the ornaments represent delicate little birds in the most natural postures while others are made of the breasts of humming birds, surrounded by leaves made of parrot's feathers, forming gorgeous flowers, of variegated hues, of the most beautiful description. These ornaments are made by the nuns of one of the convents of Brazil.

BLASTING ROCKS UNDER WATER.



The annexed engraving is an illustration of what is termed "Mons. Maillefert's Invention for Blasting Rocks under Water without Drilling." A patent was granted for this method of blasting rocks on the 2nd of last March (1852,) and at the time we published the claim, we directed attention to what we deemed an act of injustice in granting a patent to a person for an invention that is public property. As our remarks have not yet been answered, we must still look upon that act as an unjust one. After describing the method of blasting we will proceed to give our reasons for entertaining such sentiments. The figure in some part of a channel or harbor exhibits a dangerous rock, which it is desirable to remove; how shall this be done, is the question? The common way of blasting is to drill a hole in the rock, put in a charge of powder, and ignite it; the expansion of the powder rends the rock into fragments, and it can then be removed, or if it is like Pot Rock at Hell Gate (so happily removed by Mons. Maillefert, and for which we give him due credit) with a deep basin round its seat, the fragments will fall down, fill up the whirlpool and not require to be removed, by grapnels or cranes and nippers. Hitherto such rocks were drilled by men going down in diving bells, and the blasts used to be ignited through long tubes, until the discovery of igniting them by the electric spark was made. The new method ignites the blast with the electric spark as before, but the rock is not drilled, the charge of powder is merely set in a crevice or fissure part of the sunk rock in a canister, and then ignited with the electric spark from a galvanic battery. The question may be asked, how can this process burst a rock? The answer is, "the superincumbent stratum of water above the charge, as a medium of resistance to the expansion of the powder, acts like a lever, whereby the force of the powder is made to strike the rock like a monster hammer in the hands of a quarryman."

a is a canister of powder which has a loop on its neck, by which it is slid down upon the rock, on the guide pole, *b*; it is carefully lowered by a person having hold of the rope, *c*. In the other boat is the person who is to ignite the charge. This is done with a galvanic battery, *e*, having a long circuit wire or conductor, *d*. This wire is double, that is, it is disconnected at the battery, as shown in the figure, and it is also broken at the end in the canister of powder, where it is to ignite the charge, when the circuit is closed, as is well known to electricians. The conductor, *d*, is a double wire, and is inserted through the canister into the charge, and the opening closely sealed. If a wire forming an electric circuit is broken, the current ceases to flow at once, but if the broken points of the wire are brought near together, a spark will be observed to pass at the broken point; this is the way the charge is ignited in the canister. The circuit of the battery, *e*, is now broken; the wire to connect the two poles is shown to be disconnected; whenever the operators who are adjusting the canister, get all things secured and in proper order, they row away to some distance, when the person in the other boat ignites the charge in the canister, *a*, by connecting the wires which branch from the two ends of the battery, *e*. The water rises by the explosion to the height of nearly 100 feet, and appears like the sudden upburst of a huge spouting fountain. The charges employed for blasting have been about 100 lbs. of powder each, but the size of the charge depends entirely upon the amount of work to be done.

In the channel between New York or Manhattan, and Long Island, which communicates with the Long Island Sound, there existed a dangerous rock near Harlem, which created a whirlpool, bearing the not very polite name of Hell Gate. This small whirlpool, immortalized in the "Water Witch" of Cooper, lies in the direct channel of vessels going from New York, in that direction to the Atlantic. No large ship dared to face such a dangerous passage. That whirlpool has ceased to roar, and is no longer a terror to our coasters. For this all thanks are due to Mons. Maillefert, a French engineer; he has spoiled future romancing about the terrors of Hell Gate, and although it may still bear the old name, it will only be like an old tale of ghost or ghoule. The above engraving shows the method of blasting by which Pot Rock was disintegrated and reduced in height; the debris from the top of the rock fell down around the base, which being of great depth from the top, did not require to be removed, but helped to form a partial breakwater in filling up the gulley of the whirlpool. A number of rocks in the same channel must be removed before it can be called safe for vessels; we hope this will be done soon, for the expense of doing so, in comparison with the benefits conferred upon the commerce of New York, is as nothing.

Let us now say a few words about the history of the invention. We are grateful to Mons. Maillefert for introducing and showing its practical workings in this country, but at the same time, he is not the original inventor, according to the evidence before us, and he should not have been granted a patent; Capt. Fisher, R. N., Harbor Master of London, introduced this method of blasting, for the removing of obstructions in channels, in 1845. In the Illustrated London News of May 2nd, 1845, there are engravings of the process successfully carried into effect, by Capt. Fisher, for the removal of a shoal in the Thames channel. In the same paper of Jan. 8th, 1848, there are illustrations of the process successfully carried into effect by the same gentleman for blowing up another shoal. The plan of Capt. Fisher is fully illustrated in the Illustrated News, and there is not a shade of difference between it and that practiced by Mons. Maillefert. Now, as this invention was made public property more than 7 years ago, and every civil engineer should know this, how came it to pass that a patent was granted in the month of March last? This system of blasting is illustrated in Hunt's Merchants' Magazine of this month, and is there described as the invention of M. Maillefert. It is not to be expected, that the editor of that magazine should search up and discus the question of priority of invention—that is not his business, but when we illustrate an invention, it is expected of us that we should know something more than common about it. We have therefore quoted, as it were, chapter and verse, so that any person can examine for themselves the authority we have adduced, and see whether we have said aught that is incorrect. We hope, however, that as M. Maillefert has been the successful introducer of this plan of removing obstructions in channels of rivers, &c., that he will be extensively employed and liberally rewarded; he has already done the State much service.

New Chain Machine.

The Boston Journal describes an ingenious machine recently set in operation there for making small link chains. It cuts out the wire the requisite length for a double eye, then it turns it over and links it to another length, thus turning the links, and doubling them alternately, one with the other, until the whole length of the chain is completed.