LAUNCH OF THE IRON BATTERY "KEOKUK."

On Saturday, the 6th ult., the iron-clad, turreted battery *Keokuk* was launched from the foot of Eleventh street (E. R.) This vessel is one which was projected by Mr. C. W. Whitney, of this city, and differs materially from any of the other iron-clads now building or about to be built. She is 159 feet long, 36 feet 3 inches beam, and has 13 feet 6 inches depth of hold. There are two fixed turrets and a short smoke-pipe visible above deck; these alone break the smooth surface which everywhere slopes to the water's edge. Below the water-line the *Keokuk* is an ordinary sea-going craft of good model; above this mark however, she hassomepeculiarities worthy of mention. The side armor extends 4 feet below the fighting draft, which will be about 8 feet 6 inches, and for a portion of the length, amidships, presentsan angle of 37° to the horizon. Thisinclined armor runs up to the main deck on each side, which is but little wider than the turrets. The bow and stern of the *Keokuk* round away to the water, and present the same appearance to the eye that a wasp's body would immersed. The stinger however, is not in the same relative position. The deck beams are a continuation of the ships ribs, which are of iron 4 inches deep by 1 inch thick, placed 18 inches apart. Over these ribs a ½-inch plate is laid, and that relaid again with a 5-inch wooden deck; this latter is caulked water-tight and then armed with two ½-inch iron plates, somewhat similar to the Ericsson *Monitors.* The casemated portion of the vessel, 5¾ inches thick, is laid with iron 4 inches deep by 1 inch thick, placed 1 inch apart; the interstices being filled in with yellow pine. The remaining 1¾ inches are made up by the outside sheets. This armor is fastened on with countersunk bolts 1⅛ inches in diameter and 12 inches apart, secured inside with strong, six-sided nuts. The deck has only seven-eighth bolts through it.

The turrets, two in number, are stationary, and mount one 11-inch gun each. They are 14 feet in diameter at the top and 20 feet at the base, extending 7 feet above the deck, and twenty inches below it; upon a platform constructed at that line the guns are mounted. The turrets proper consist of wrought-iron skeletons, made of flat iron, 5 inches deep by 1 inch thick, placed edgewise, 15 inches apart and secured to a ½-inch sheet by 4 wrought-iron clamps 4 inches deep by 1 inch thick. The 15-inch spaces remaining inside are filled up with wood, and afterward covered with a thin, sheet-iron lining to make a smooth finish; outside of the turret-skin, ½-inch plate, the protection is the same as that of the casemates. Each turret has its own shot, shell and powder magazine, communicating from the deck, just underneath the tower, by hatches. In the after-end of the forward turret is the pilot-house, which is 2 feet higher than the main structure, where the helmsman controls the vessel by the usual steering apparatus.

The turret gun decks, 20 inches below the main deck, consist of a circular iron frame 6 inches deep by ¾ of an inch thick, supported by 12 wrought-iron beams 2½ inches in diameter. This frame is further crossed at regular intervals by 14 wrought-iron beams, also 6 inches deep and ¾ of an inch thick. At right angles with the latter a strong box girder, 12 inches by 18 inches across the angles, is riveted to the circular frame, being strengthened in the middle by a heavy wrought-iron column 5 inches thick. Upon the top of the 14 beams, previously mentioned, a wooden deck 5 inches thick is laid, to which the gun-ways are made fast. In the centre of the turret the gun is pivoted; three ports are made for it in the turret—two broadside and one aft or forward, as the case may be—through which it pays its compliments to the enemy. A lateral range of 8° and a vertical one of 10° can be obtained for the missile. From the lower deck, inside the turrets, two doors permit communication with the forecastle and also the engine-room and officers' quarters. There are two water-tight compartments in the vessel, one fore and aft, to which access is had by the usual man holes; these can be filled with water, if desirable, in a short time, and will, it is calculated, settle the ship one foot. The forecastle is large and roomy, so much so that 100 men can swing their hammocks in it. Alongside of the vessel, just behind the casemates, are the coal bunkers, and immediately inclosed by them and two fore-and-aft bulkheads, are the steam boilers. Before a shot can strike the latter it must pass through the inclined side, the coal and also the two stiff bulkheads or partitions, just mentioned; they are therefore very fully protected. The officer's quarters promise to be cool, well lighted, and thoroughly ventilated; as the lower part of the turret is entirely open, or can be rendered so, there will be, apparently, at all times a free circulation of air. They are also further ventilated by thirteen 6-inch deck lights.

The *Keokuk* is propelled by engines of 500-horse power, designed for her by Mr. N. A. Wheeler, of this city. They consist of two twin-engines, one upon each side, the cylinders of which are 23 inches in diameter by 20 inches stroke, worked by two return tubular boilers, of 3,000 feet fire-surface and 82 feet of grate surface, having side furnaces. There is also one of Sewell's surface condensers, having galvanized iron tubes. The engines are of the locomotive finish in respect to the fittings of the connecting rods, link-motion, &c. They drive a true screw, under each quarter, of about 7 feet diameter. A stout ram, 5 feet long, projects from the bow, which seems capable of doing some damage to an adversary. Our space warns us that we must omit other details for the present.

The launch was very successful. A delay took place owing to the cold weather, which hardened the grease upon the sliding-ways. As the vessel had but a slight inclination she was loth to start from her comfortable position. Once off, however, she glided down gracefully to the river, making a parting salaam to the assembled multitude who responded with vigorous hurrahs and hat-wavings. Mrs. Whitney, wife of the projector, christened the *Keokuk* as she was descending. A fine collation was prepared in the boiler-shop of the Works, to which, after the ceremonies were concluded, a large number of guests repaired. Toasts were given, and cheers proposed for Mr. Whitney, which were responded to by a Mr. Ryan, of California; Mr. Whitney's modesty preventing him from answering to the calls of his friends. The different engineering firms were represented by Messrs. Quintard, of the Morgan Iron Works, Mr. Thomas Faron, of the Navy Yard, Mr. Underhill, of the Dry Dock Works, &c. Navy officers were also in force on the occasion. Commodore Alexander C. Rhind will command the *Keokuk,* and we shall look with interest to her nautical and naval performances, and also endeavor to give our readers some account of the former.

CHEAP OXYGEN GAS--LIGHT AND HEAT.

The oxyhydrogen or Drummond light is produced by burning currents of hydrogen and oxygen gases upon a piece of lime. This is the light which is usually employed in exhibitions of the "magic lantern," and it is so brilliant that the eye cannot gaze upon it. A sphere of this light resembles a miniature sun, and could it be produced at a moderate cost and a very durable material in place of the lime obtained, it would be the best and most desirable of marine lights for dangerous coasts and for the illumination of cities and other purposes. This light was discovered by Dr. R. Hare, of Philadelphia, but it received its more general name from Lieutenant Drummond, who first applied it practically at night, many years ago, in making a government survey of Scotland. The oxy-hydrogen light also gives out a most intense heat, and it is eminently adapted to the reduction of the most fractious metals, such as platina, &c. In fusing common metals with the blow-pipe, atmospheric air is blown through the flame of alcohol, oil, and common gas, and thus a very intense heat is produced; but the temperature of such flame can be intensified five-fold by the use of pure oxygen gas in place of common air for the blast, because the latter contains only one-fifth of oxygen, which is the supporter of the combustion. Atmospheric air is composed of nitrogen, 79; oxygen, 21; therefore when it is used for the blast of a flame, and as a supporter of combustion, the great quantity of the inert nitrogen acts as a cooling medium, because it is heated with the products of combustion, and carries off a large quantity of heat. Could pure oxygen gas be obtained at a moderate cost, so as to be used for the blast of smelting furnaces and as a supporter of combustion for illumination, a complete revolution in many arts would be effected thereby. It would effect a great saving of fuel; and many minerals which are now held to be too fractious for common smelting operations could be reduced with ease and economy. All combustible substances burn with great vigor, and many of them with wonderful brilliancy, in oxygen gas. The most common way of manufacturing it has been from the chlorate of potash and the oxide of manganese, submitted to heat in a retort. Although oxygen is the most abundant substance in nature, the price of materials and the expense of manufacturing it have been so great, that it could not be made for less than from four to five dollars per hundred cubicfeet—a cost which precludes its common use entirely. Chemists, metallurgists and others have long been in search of a cheap method of producing this gas, but hitherto without satisfactory results. Some of our late foreign exchanges, however, contain accounts of such a discovery by Mr. J. Webster, London, who has secured a patent, and a company has been organized to manufacture the gas and introduce the invention. The materials used for producing it are the nitrate of soda and the crude oxide of zinc. A description of the process has been given in the *Chemical News,* by J. H. Pepper, professor of chemistry. The materials, in the proportion of ten pounds of the nitrate of soda and twenty pounds of the crude oxide of zinc, were first moistened and mixed together, then thoroughly dried to expel all the moisture, and afterward placed in an iron retort, heated to dull redness in a furnace. From this quantity of these substances 32.968 cubic feet of a mixed gas was obtained, the composition of which was 59 per cent of oxygen and 41 per cent of nitrogen. Nitrous acid also passed over, but it was absorbed in the purifier which contained moist caustic soda. It is stated that the residuum of these materials are said to be valuable products, and may be sold so as to reduce the cost of gas. The materials used for making this gas are only about one-fifth the cost of those used to make oxygen gas in the common way. Pure oxygen gas, however, has not been obtained by this process; still it is much superior to common air for illumination. This has been determined by experiments. Judging from the nature and cost of the materials used and the results obtained, we conclude that an advance has been made in this department of chemistry, but other discoveries and improvements must be made before oxygen gas will be obtained for general use in the arts. We trust this notice will be the means of inciting others to investigate this subject at further length, as it is one of great importance and promises to be fruitful in useful results.

A Singular Shot.

A few days ago a paragraph appeared in the Boston *Journal,* headed "A Singular Shot," and stating that, at the navy yard at Washington a 130-pound solid shot fired from a 10-inch smooth-bore Dahlgren gun at the distance of 500 yards from the target, penetrated four inches of iron plating and ten inches of white oak planking. A correspondent at Washington, who witnessed the experiment, writes to the *Journal* in order that the facts of the experiment may be stated. He says:—"A 10-inch Dahlgren was charged with 30 pounds of powder and a 130-pound solid shot, and was fired by means of a slow match. The shot made a clean hole through the target, which is composed of one iron plate, 4½ inches thick, and six other plates each one inch thick, bolted to a framework of white oak planking 18 inches thick. The target may be about 500 yards distance. These are the main facts as I observed them. Our English and French friends won't think we have made much progress if, on extraordinary occasions, we can only get through four inches of iron and a 10-inch oak plank."

A Difference.—The annual pay of an English soldier averages $100, and that of the French $50. A French colonel (full pay) has $1,500, and an English $6,000. In France a vice-admiral has $8,000, in England $12,000. The French rear-admiral receives $6,000, and the English $17,000. Few of our army and naval officers manage to live as cheaply as the French naval lieutenant, who has to find his own uniform and food out of 120 francs a month, or less than $300 a year.

Waste of Cities.

Paris throws five millions a year into the sea. And this without metaphor. How, and in what manner? Day and night. With what thought? Without thinking of it. With what object? Without any object. For what return? For nothing. By means of what organ? By means of its intestine. What is its intestine? Its sewer. Five millions is the most moderate of the approximate figures which the estimates of special science give.

Science, after long experiment, now knows that the most fertilizing and the most effective of manures is that of man. The Chinese, we must say to our shame, knew it before us. No Chinese peasant, Ekeberg tells us, goes to the city without carrying back, at the two ends of his bamboo, two bucketsful of what we call filth. Thanks to human fertilization, the earth in China is still as young as in the days of Abraham. Chinese wheat yields a hundred and twenty-fold. There is no guano comparable in fertility with the detritus of a capital. A great city is the most powerful of stercoraries. To employ the city to enrich the plain would be a sure success. If our gold is filth, on the other hand our filth is gold. What is done with this filth, gold? It is swept into the abyss.

We fit out convoys of ships, at great expense, to gather up at the South pole the droppings of petrels and penguins, and the incalculable element of wealth which we have under our own hand we send to the sea. All the human and animal manure which the world loses, if restored to the land instead of being thrown into the sea, would suffice to nourish the world.

These heaps of garbage at the corners of stone blocks, these tumbrils of mire jolting through the streets at night, these horrid scavengers' carts, these fetid streams of subterranean slime which the pavement hides from you, do you know what all this is? It is the flowering meadow, it is the green grass, it is marjoram and thyme and sage, it is game, it is cattle, it is the satisfied low of huge oxen at evening, it is perfumed hay, it is golden corn, it is bread on your table, it is warm blood in your veins, it is health, it is joy, it is life! Thus wills that mysterious creation which is transformation and transfiguration in heaven. Put that into the great crucible; your abundance shall spring from it. The nutrition of the plains makes the nourishment of men. You have the power to throw away this wealth, and to think me ridiculous into the bargain. That will cap the climax of your ignorance.

Statistics show that France, alone, makes a liquidation of a hundred millions every year into the Atlantic from the mouths of her rivers. Mark this: with that hundred millions you might pay a quarter of the expenses of the Government. The cleverness of man is such that he prefers to throw this hundred millions into the gutter. It is the very substance of the people which is carried away here, drop by drop, there in floods, by the wretched vomiting of our sewers into the rivers, and the gigantic collection of our rivers into the ocean. Each hiccough of our cloaca costs us a thousand francs. From this come two results—the land is impoverished and the water infected; hunger rising from the furrow and disease rising from the river. It is notorious, for instance, that at this hour the Thames is poisoning London.—*Victor Hugo.*

The Revolutions of the Stars—An Error Detected.

We take pleasure in publishing the following communication from the Rev. William Isaacs Loomis, of Martindale Depot, N. Y.:—

In the appearance of nature the times of the revolutions of the stars are so graduated to each other that, when one appears to set out from a given point in its diurnal and annual revolutions, the time of the apparent diurnal star will bring it to the same absolute point which is occupied by the apparent yearly star at the close of the sidereal year. The times of the apparent revolutions of the stars, as given in the accepted system of astronomy, involve the absurdity of a star being in two different places, a little more than one-fourth of the circle of the heavens distant from each other, at the same instant of time. From this it is certain that the astronomers' times of the apparent revolutions of the stars have no foundation in truth. Herschel says the *time* of an apparent diurnal revolution of the stars is 23 hours, 56 minutes, 4.09 seconds; and the time of the apparent yearly revolution of the stars is, in solar time, 365 days, 6 hours, 9 minutes, 9.6 seconds, which is equal to the time of the sidereal year. The proportion that these times bear to each other is that, in the time in which a star will make one apparent yearly revolution, it will also make, in appearance, 366 diurnal revolutions and an arc of 92°+. The result which follows from this should be that, if a star sets out from a given point in its apparent diurnal and yearly revolutions, at the close of the sidereal year, the apparent diurnal star will have reached a point 92°+ beyond the point at which the apparent annual star finishes its yearly revolution. To illustrate this, take, for example, the point where the circle of the ecliptic intersects the circle of the celestial equator; and suppose a star to set out in its diurnal course, appearing to move in the plane and circle of the celestial equator, and at the same instant to set out in its yearly course, appearing to move in the place of the ecliptic. Because the star is said to make an apparent diurnal revolution in 23 hours, 56 minutes, 4.09 seconds, at the close of 365 solar days, 6 hours, 9 minutes, 9.6 seconds, the apparent diurnal star will have finished 366 revolutions and an arc of 92°+, and the apparent place of the star in consequence of its diurnal motion will be advanced in right ascension 92°+ from the point at which the star completes its yearly revolution in the plane of the ecliptic. Hence from the accepted star time it is demonstrated that a star can be in two different places at the same moment; the intervening distance being a little more than one-fourth of the circle of the heavens! The absurdity of the demonstration is obviously a most serious interference with the astronomers' claim that the science of which they are the masters "is founded on laws which are immutable."

VALUABLE RECEIPTS.

Testing Auriferous Pyrites for Gold.—It has been very desirable to obtain a simple method of determining the amount of gold in auriferous pyrites, because the aspects of the gold and the pyrites are so much alike that the one cannot be distinguished from the other with a lens. The exploring miners in California, Australia and other places, have been at a loss to find out the amount of gold in the auriferous pyrites which they have discovered; hence in many cases, they have mistaken pyrites for gold and *vice versa.* The following simple mode of examining auriferous pyrites is given by Lewis Thompson, analytical chemist, in *Newton's London Journal of Arts*, and he states it was furnished upon application to a miner who went to Australia a few years since, and who has lately returned to England quite wealthy:—

Having provided a common tea-cup or other similar vessel, cut a piece of card into a circular form, and of such a size that it will rest midway in the tea-cup: then take a small piece of the pyrites recently broken, and make a hole in the center of the card, just large enough to admit and retain the pyrites: now put into the tea-cup a small quantity of quicksilver, about the size of a four-penny piece, and place the card in the cup, so that the pyrites may rest a short distance above the quicksilver: next place the whole upon the hob or other warm (not hot) situation, and so leave it for half an hour; at the end of this time examine the surface of the pyrites with a lens, of the kind used by watchmakers and which are sold in London for sixpence or a shilling each: the particles of gold will now be of a white color, as if frosted over, and if the whole be rubbed with a camel's hair pencil or the top of a quill, the gold will assume a brilliant appearance like a mirror or the surface of a piece of newly-polished silver, while the rest of the pyrites will remain unaffected. It is then easy to judge of the comparative value of the ore.

Preserving Pictures.—Many valuable oil paintings suffer premature decay from attacks of microscopic insects. The best way to prevent this species of decay is to add a few drops of creosote to the paste or glue that is used to line the pictures; and also to add some creosote to the picture varnish. Paintings should be kept in a pure dry atmosphere. Many valuable paintings that are hung against solid walls of masonry, in churches and other buildings, are subjected to a damp atmosphere, and the canvas becomes moldy. Old pictures which have become blackened, are restored by washing them with deutoxide of hydrogen, diluted in eight times its weight of water. The parts thus touched must be afterward wiped with a clean sponge and water.

The Colors of Flames.

In burning pure hydrogen gas upon a loop of fine platina wire, a white light is produced. In such a flame various substances emit different colors. Phosphoric acid gives a beautiful light green; sulphuric acid, a beautiful blue color; boracic acid an intense green; chromic acid a rose color, and molybdic acid a yellow-green flame. Nitric and nitrous acids give a bronze-green color, and muriatic acid a greenish blue. Of the alkalies, potash gives a rose-violet flame color, and soda an orange-yellow flame color, which in very large quantities appears pure blue; lithia affords a carmine red color, and baryta a blue-green flame. Strontia gives a beautiful rose color; this substance is chiefly used for this purpose in fire-works. The nitrate of copper gives a green flame; the chloride of copper, an azure blue. Every substance produces its own peculiar color or shade of color in flame; hence a knowledge of the colors of flames is essential to the chemist, and now forms a peculiar branch of chemical investigation.

Intermarriage of Deaf Mutes.

The question of the intermarriage of deaf mutes was the subject of a paper recently read before the French Academy of Sciences by Dr. Boudin, who took the ground that the infirmity is not hereditary. The parents of deaf and dumb children, he observed, are generally in perfect health, and, moreover, deaf and dumb parents not connected with each other by ties of consanguinity very rarely have deaf and dumb children. He quoted an observation made by Dr. Perron, of Besançon, of two brothers of the name of Vallet, splendidly constituted and enjoying the most perfect health, who married two sisters—their cousins german. The elder has had several children, only one of whom, now aged twenty, is deaf and dumb. The younger brother has had six children, the first, third and fifth of whom could hear and speak, while the second and fourth were deaf and dumb; the sixth, still in its cradle, does not seem sensible of any noise they may happen to make in the room. These cases are utterly in contradiction to the doctrine of inheritance.

Mustard.—The Sacramento (California) *Bee* says:—There were shipped from San Francisco last week, 234 bags of mustard for New York. It is known that the wild mustard, or the mustard which grows wild on hundreds of thousands of acres in southern California, counting from Santa Clara down, is superior to the English imported mustard. This home mustard is in general use in this State, and for many years it has been gathered by parties and shipped abroad. The supply seems almost endless, and the business of gathering it ought to be, and will yet be, when labor becomes cheaper, a leading one in the commercial interests of the State.

Last Thursday a telegraphic dispatch was sent from New York city, between three and four o'clock in the afternoon, to San Francisco, and an answer received between six and seven in the evening!