engine is a simple slide-valve engine, and can be used as such, should any accident occur to the cut-off. The cut-off mechanism itself is also of the simplest possible description, having the least possible number of parts, consistent with a proper performance of its functions. It consists of two cut-off slides, a miniature steam cylinder, and a valve for controlling the admission of steam to the same. This small cylinder, being enveloped in the steam, requiring no packing, and having only the weight of its piston to produce wear, is, for all practical purposes, indestructible. The cut-off slides are always balanced when they move, consequently they are not exposed to injurious wear.

Another advantage of the Babcock & Wilcox engine is that it is easily comprehended by ordinary mechanics. The motions and adjustments are similar to those familiar to any one who understands a plain slide-valve engine; and any man who can adjust such an engine properly, can readily adjust this.

The cut-off valve of this engine presents a convenient means of stopping at any desired point, simply by opening or closing the cut-off valve by hand, as the case may require. The engine may be warmed up, also, without danger of starting, by closing the cut-off valve by hand. In cases where it is desirable to back the engine, a starting bar may be readily shipped and the engine handled with the same ease as the plain slide.

The bed or framing which has been adopted for horizontal engines is of the form first introduced by Horatio Allen, Esq., of the Novelty Iron Works. It is bolted to the end of the cylinder, and extends to the pillow-block, and the metal is so disposed as to give the greatest rigidity with the least weight. The cross-head is upright, and is supported on flat slides, a drip cut cast on the bed serving to catch all drippings, not only from the slides, but from all the stuffing boxes.

The regulator or governor is driven by gearing, thus avoiding all danger of breakage or slipping of belts, and the consequent damage to the engine and machinery from the "running away" of the engine.

In addition to the steam jacket for preserving the temperature of the cylinder, a covering of felt is employed around all the exposed parts, and this in turn is covered by a casing of polished metal. The latter is the best possible protection against loss by radiation.

In the construction of these engines, no pains or expense is spared to procure the best material and workmanship, and the proportions and relative strength of all the parts are calculated with the utmost care, from formulas based on long experience, as well as a thorough knowledge of the qualities and peculiarities of the materials. Great attention is also paid to giving artistic forms to the various parts, every piece being designed with reference to rigid simplicity and a cultivated taste.

The largest engraving gives a perspective view of the engine.

Fig. 1 represents a horizontal section of the cylinder and valves, showing the peculiarities of the cut-off motion. A, is the cylinder which is steam jacketed as are also the heads. B, is a portion of the bed piece, which forms also the front head of the cylinder. C is the piston and C' the piston rod. D, is the main valve, e e' the induction ports, and F, is the exhaust port. The body of the valve is hollow and conveys the exhaust steam from either end of the cylinder alternately to the exhaust port, F, whence it goes into the exhaust pipe. The steam passes through ports e' in each end of the valve, into the induction ports of the cylinder, alternately as they are opened by the motion of the valve derived from an eccentric in the usual manner. On the back of the valve at either end is a slide, G, which can be made to cover the port at that end, and these slides are each attached to one end of a piston, H, fitting in a small steam cylinder bolted to the back of the valve, and so adjusted that when the port in one end of the valve is closed the other is open. Upon steam being admitted to either end of the piston, H, the piston is shot over and the corresponding side closed to cut off steam from that end of the main cylinder; while the port at the other end of the main valve is opened ready to admit steam to the other side of the main piston when the valve shall arrive at the proper position.

It will be observed that the cut-off slides, G, are always balanced when moved. The one about to close having steam of equal pressure upon each side, while the other one has been balanced by the main valve riding past the end of the valve face on the cylinder, thus admitting steam behind the slide, G. This condition obtains during the whole stroke of the piston until the steam is cut off, after which the cut-off slides, G, remain stationary relatively to the main valve until ready to cut off steam on the return stroke, previously to which time they have been balanced by the over-riding of the valve at the other end. These slides, have, therefore, literally no wear, and once fitted tight, they will remain so indefinitely. The piston, H, in the small cylinder, is turned to fit, and has no packing, neither have the rods stuffing boxes, as the pressure is equal on both sides except during the inappreciable time which intervenes between the exhausting of the cylinder, I, and the movement of the piston. The only tendency to wear in these parts is due to the weight of the piston and rods, which is supported on large surfaces. In fact, after twenty months constant use, none of these parts have worn sufficiently to obliterate the tool marks upon the surfaces.

Steam is admitted alternately to each end of the piston, H, at every revolution of the engine, causing the cut-off slides to move at every stroke, cutting off the steam at the point determined by the governor.

Fig. 2 shows a cross section of the cylinder, I, and its valve. This valve is balanced by the plate, J, upon its back and is operated by a toe upon the rock shaft, L, carried upon the main valve, and extending through the end of the steam chest where it receives motion from a crank, M, which is adjusted in its position by the governor. The exhaust ports of the cylinder, I, are made upon the bottom and are at a little distance from the end, while the steam ports are upon the side and at the extreme end of the cylinder. By this arrangement the piston closes its own exhaust port and cushions on the remaining distance, thus dispensing with all dash pots or air cushions, and causing the valve to work without any noise.

The valve, i, being balanced, and the rod, L, carried through its stuffing box by the main valve, there is the least possible power required by the regulator to adjust the crank, m, thereby ensuring a more sensitive action than can be attained where the governor has labor to perform.

The governor is peculiar and is shown at Fig. 3. The balls, N, are hung upon arms in the usual manner, which arms are jointed at their upper ends to a head attached to the rod, o, which slides within the hollow shaft that drives the balls; the motion being communicated through the radius rods, p, which are jointed at their lower ends to the gearing shaft, and at their upper ends to the center of the arms, n. The rods, p, are half the length of the arms, n, measuring from the center of the ball, and it will be readily seen that in consequence of this arrangement the arms, n, and rods, p, form a parallel motion and compel the balls to move outward in a horizontal plane.

In the ordinary pendulum governor the balls move in the arc of a circle and rise as they extend. It therefore requires an increased speed to maintain them in their advanced position. The engine must consequently run faster when the load is light than when it is heavy, and such is the case with all ordinary governors. In this improved governor it will be seen that the gravity of the balls has no tendency to move them in either direction, and exerts no influence whatever upon the speed of the engine. The centrifugal force causes them to diverge, and a weight, W, tends to bring them towards the shaft. When therefore these two forces are in equilibrium the balls will remain in the same position, but as either preponderates they are moved in a corresponding manner, thus affecting the speed of the engine by varying the amount of cut-off. The weight, W, is supported upon a bent lever which is so proportioned, that the centrifugal force at any given speed will just balance the weight in all positions. The speed of the engine, will, therefore, remain at that fixed point with all variations of load or pressure of steam; for any increase or diminution will cause either the balls or weight to preponderate and the point of cut-off to be changed until the speed is again brought to the standard where the two forces are in equilibrium.

Any desired speed can be obtained by altering the weight, W, and the action of the governor will be as perfect in one case as in any other. A spiral on the rod, o, serves to advance or retire the crank, m, relatively to the main crank, so as to cause the cut-off to occur earlier or later in the stroke, as the balls diverge or converge; and the amount of this adjustment is such that the cut-off may be varied from nothing to seven-eighth stroke. [See Advertisements on page 270.]

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

The Late Explosion in New York City.

Messrs. Editors:—After a careful and reflective examination, I have come to the conclusion that the steam boiler disaster in Twenty-eighth street was not an explosion, but that the boiler gave out and was carried to the place where we found it by the ordinary pressure of steam. I find the rupture was in the strongest part of the boiler—the tube cylinder—which was 52 inches in diameter and 7 feet long, made of 5-16 iron, which was of good quality. The outside shell was 96 inches in diameter and but 4-16 thick. Now, taking the diameters of the two into consideration, and the extra thickness of the iron of the tube cylinder, I find it capable of sustaining fully double the pressure per inch that the outside shell could; yet the outside remained entire.

There is nothing to indicate a lack of water in the boiler, but the most conclusive evidence that there was a full supply. Had there been a lack of water, the boiler would undoubtedly have been destroyed, but its subsequent flight, the destruction of two lives and a dwelling house 150 yards distant would in all probability not have been the result.

This seems perhaps paradoxical, but if we examine the construction of the boiler which our readers will see illustrated on the first page of this journal dated July 9th, 1867, we will see that it is of that type of boilers having a large fire surface with a very small water space, particularly in the tube cylinder, which is on one side exposed to intense heat outwardly, while the heat returns through the tubes internally. In the upper half of this cylinder, probably, the major part of the steam was generated, which of course must find its way to the steam reservoir in the top—the water spaces being small around the tubes—the water was necessarily forced out by the steam, the iron heated—the water returns on the heated iron—thus alternately expanding and contracting the plate of the cylinder most exposed to the intense heat of the furnace, while its attachment to the main part of the boiler being less exposed to heat, was expanded less. This alternating continually weakens, disintegrates, finally destroys the strength of the iron, and it gives out in the strongest part!

I have said that there was no evidence of a lack of water. This is proved by the fact that the crown is one foot or more above the top flue sheet of the inner tube cylinder, showing no marks of overheating. This crown sheet is flat, sustained by suspension stays from the top. It was intact—no depression in any part, nor any marks of overheating, while the tube sheet of the cylinder showed most unmistakable evidence that when the rupture took place, that and one half the length of the tubes and one half of the shell of this cylinder were *red hot!*

With regard to the elevation and flight of the boiler, if we assume the boiler had 60 pounds of steam to the square inch, this multiplied by the area of 96 inches (the diameter of the outer shell of the boiler), gives us an ascensive power of nearly 218 tuns, while the parts of the boiler that ascended weighed but about four tuns.

Now there is ample evidence that the water and steam (and the water contained in the boiler would become steam when liberated) was still being discharged from the lower end of the boiler until it landed, acting precisely like the force of gunpowder being discharged by a rocket in its ascent.

Now taking this view of it, the escaping steam had to impinge on the atmosphere, which we will assume as 15 pounds per square inch, this multiplied by the area of 96 inches, gives us a propelling power of more than 54 tuns, against 4 tuns to propel.

Need we look after a *gastheory* to give these results? Is it necessary to invent any "mysterious" causes? I found the iron of which the boiler was constructed good, the workmanship unexceptional, but the principle on which the boiler is constructed wrong. F. W. B.

Artesian Wells in Illinois.

Messrs. Editors:—I crave a short space in your scientific journal for the purpose of asking a few questions that would perhaps interest some of your 100,000 readers, and may benefit the inhabitants of this section. Onargo, the point whence this comes, is located in central Illinois, 85 miles south of Chicago. It is in the center of what is known as the Artesian Well region. These overflowing wells can be produced within a radius of 20 miles at the depth of 70 feet, variations in surface allowed. Water is procured by boring with a six-inch auger through about 5 feet of soil, 10 to 20 feet of sand, 15 to 20 feet of blue clay, 20 to 30 feet of hard pan, a composition of blue clay and coarse sand or gravel, and as hard as baked pottery, and into a bed of white sand called "water vein." In this bed of sand the water is found, it will in many places fill the discharge pipe several feet above the surface, which may be conducted to any part of the farm by pipes. Onargo is 92 feet above Lake Michigan and higher than the surrounding country, and these wells are found on every farm, flowing a constant stream at an even temperature. The question is, where does this water come from? Some of these wells throw 20 gallons per minute, others 120. A gentleman well acquainted with this country and the numerous wells, estimates the amount of water brought to the surface in this district at 53,400,000 gallons per day; this is allowing but 50 gallons to a well per minute. Where does this water come from? It cannot come from the lake, as we are so much higher than that body of water. It cannot collect in reservoirs from the surface, because it is impossible for water to penetrate the stratum known as hardpan, that overlays the sand or water vein. In this vein, where the water is found, there are no vacuums, or lakes, or veins of water, or currents, but a hard and compact bed of sand, almost pure white. Now if this water does not come from the lake or surface in this vicinity, but its source is a body of water some distance away, would it not be necessary for it to be at a great hight to overcome the resistance it meets in traveling through this bed of sand? Say this old theory is correct, say that the source is 200 miles away and 200 feet higher than the discharge, would not the resistance it meets in traveling through this compact bed of sand so overcome the power it receives from the fountain head that it would fail to reach the surface? Or do you consider that this water is conducted through this sand on the capillary principle? and if this is true why is it that beyond a certain radius they bore to the bed rock and fail to procure water?

A great many other things I would like to ask, but I know I must be brief. We find peculiarities in every section of this great artesian well country, most of them worthy of note, which if collected would fill your paper a dozen times. If you want a map of this section, with number of wells and location, size of streams, etc, I will forward the same.

Ed. Rumley.

[We would be glad to receive from our correspondent any further information he may deem interesting.—Eds.

Turbines and Water Power.

Messrs. Editors.—For some time I have watched with peculiar interest for items relating to Hydraulics, especially in reference to the most economical use of water power, as I am about fitting up a mill where I have a fair water power. In your issue dated October 5th, I notice two statements purporting to be made by parties using the "Leffell wheel," which seem to me to be extremely improbable, viz., in one case where a turbine wheel of only 6 inches diameter had replaced two 20 feet overshot wheels and was doing more work on less water than they had been able to, and the other where a 10-inch wheel was running 3 pairs of large flouring burrs. Now I am pretty well acquainted with the amount of power required to do the work therein stated and that acquaintance leads me to believe that this is impossible, that it is impracticable for any such wheels to accomplish these results, especially with the small amount of water said to have been used.

Now if the Leffell or any other wheel can do what is there claimed, it is certainly important for all millers and manufacturers to know it, but if as we think, it cannot be done, it is doing much injury to allow such statements to pass unchallenged, as they may mislead many, who, like myself, contemplate improvements, but who have neither the means or inclination to experiment on uncertainties or to take risks on the assertions of manufacturers of this or that article.

Allow me accordingly to ask your opinion or that of some of your multitude of readers, who are experts in the theory and practice of Hydraulics as to the possibility of a 6-inch turbine doing more work than two 20-feet overshots and as to the best way of applying water power generally. A discussion of this subject cannot fail to be of great advantage and may save much trouble and expense to many, as all through our country new water powers are being developed and brought into use, and even more attention would be given and capital invested in them, were there a more general knowledge of the subject. F. Wilber.

Philadelphia, Pa.

Our correspondent refers to an advertisement. Probably the parties whose names are appended to the document can furnish him with the information.—Eds.

End of the Comet Discussion.

Messrs. Editors:—The kindly manner in which Prof. Wilhelm, of Philadelphia, has taken exception to some features of my explanation of the philosophy of comets' tails, commands admiration; and yet I think he errs.

Comets, when in a fit condition for the production of a tail by aid of the sun's rays, are opaque and self-luminous, and are not "transparent gas," as generally supposed; hence all those rays from the sun, that strike the comet within the circumference of the opaque substance, are absorbed. Only those rays that impinge upon the luminous margin become reflected. Or, possibly, as the rays pass through the luminous envelope, they become surcharged with cometary light, and are thus made luminous and visible. Once the rays have passed the luminous margin, they again become obedient to the same law and power of transmission by which the same rays were originally conveyed from the sun to the comet.

That part of the professor's diagram marked "shadow," is shadow within the comet's tail. It is well known to astronomers that the tail is a hollow cone, with the apex at the head, and that the surface of the cone only is luminous. Now, I do know, that the tail expands as it lengthens, in obedience to the law of reflected or transmitted light; whereas a transparent sphere would refract rays like a double convex lens to a focus in opposition to the sun. Hence the tail can hardly be refracted light.

To Dr. Fullerton I beg to say that I fully believe in the "all-pervading ether theory;" but the "secular acceleration of Encke's comet" is owing to an entirely different cause.

New York. Geo. M. Ramsay.

Gravitation.

Messrs. Editors:—In reply to the inquiries of your correspondent, J. D. Caton, on page 194, current volume, I wish to say that Bassnett was not the first to propose a "mechanical explanation" of gravitation, while my hypothesis is anything but a mechanical one, in the sense of a transference of force from body to body by actual contact.

Newton himself did not believe in the inherent power of matter to attract other matter, and put forth the suggestion that an elastic medium pervades all space, increasing in density as we proceed from dense bodies outward; that this "causes the gravity of such dense bodies to each other; every body endeavoring to go from the denser parts of the medium to the rarer." The objections to this hypothesis are well stated by Whewell in his Bridgewater treatise; first, that we cannot find traces in any other phenomena of a medium possessing these properties; second, we have to suppose an inherent *repulsive* power in the particles of the medium for each other, and for dense matter. This supposition requires accounting for quite as much or more than that of simple inherent attraction, and is, beside, more complex. A subsequent theory, which excited much attention at the time, was proposed by Le Sage, in a memoir entitled, "Lucrece Newtonian," and further illustrated by M. Prevost, according to which all space is occupied by currents of matter, moving perpetually in straight lines, in all directions, with a vast velocity, and penetrating all bodies. These currents would be intercepted by gross bodies, which would thus be driven toward each other.

Mossotti more recently advanced a theory in which he attributed gravitation, as well as the attraction of cohesion and other molecular forces to a resultant force produced by a repulsion between the particles of matter; an attraction between matter and the etherial medium, and a repulsion between the particles of the latter. When the material molecules of a body are inappreciably near to one another, they mutually repel each other with a force which diminishes rapidly as the minute distance augments, and at last vanishes. When the molecules are still farther apart, the force becomes attractive. The limits of distance, at which the nature of the force changes, vary according to the temperature and nature of the molecules, by which is determined whether the body they form be solid, liquid or aëriform. This hypothesis, with some modification, is the one which is most generally received among physicists at the present time; and a nearly similar one has been recently discussed at some length by Professor W. A. Norton, in Silliman's journal.

The view which I have taken is, it seems to me, more simple than either of these, in the respect that it involves but one assumption instead of three or four to account for the same results. It is simply that force exists as a distinct separate entity, possessing quantity and direction, and only becoming cognizant to us when associated with matter, and producing motion. We arrive at the knowledge of its *independent* existence by reasoning upon these witnessed effects when so associated.

My plenum is of force and not of matter. Matter is merely a vehicle for force, and its inertia or weight is measured by its carrying capacity.

To sum up, in a few words, the substance of the paper which I read before the American Institute, which will be published in full in their next volume of proceedings, matter has no properties except that of motion, when associated with force. Impenetrability, elasticity, &c., are the manifestations of *force*, and not the properties of matter. Attractions are the results of interceptions of force; repulsions those of the excess of momentum over attractions.

A recent writer in the *London, Edinburgh and Dublin Philosophical Journal*, under the head, "Conic Theory of Heat," advances a similar idea to one of those contained in my paper, and proposed by me two years ago, viz., that the three conditions of matter are due to elliptic, parabolic, or hyperbolic character of the molecular orbits, the first corresponding with the solid, the second with the liquid, and third with the gaseous form of matter. I have attempted to trace the forms of crystals to the elliptic (including the circular) character of their orbits, and to show that in the liquid condition the relations of the forces are such that the orbits would be parabolic in single pairs, and hyperbolic in the gaseous condition. Also, to show, that the "Clash of Atoms," so much talked about of late, is a physical impossibility, impenetrability not being one of the properties of atoms.

New York, Oct. 9, 1867. Henry F. Walling.

The Number "108."

Messrs. Editors:—I beg leave of presenting herewith a few words in addition to the article, "Extraordinary Coincidences," which I saw on page 227, current volume.

The number 108 itself is very remarkable. It is composed of the prime factors 2 and 3, thus: $2\times2\times3\times3\times3$. It is the product of the second power of 2 and of the third power of 3, and can be expressed thus: $1^1\times2^2\times3^3$.

Such a remarkable coincidence cannot be merely accidental; it must have some deeper foundation in the mysteries of astronomy, such as Kepler's law in relation to the radius of the orbits and the velocity of planets. I belong to the creed of those who believe that our planetary system has been formed of one great sphere of gaseous matter in such manner known as the hypothesis of La Place. The above remarkable number may have its foundation in the proportions in which the gaseous matter separated by centrifugal force into fragments, of which the earth, the moon, and other bodies of our planetary system have been formed.

At some future time I hope to publish something more interesting upon this subject, in connection with my hypothesis about comets mentioned on page 114, current volume.

J. G. Konvalinka.

Astoria, L. I.

How to Procure Information.

Messrs. Munn & Co., Gents:—To show the value of the Scientific American as an advertising medium, I give these facts: A gentleman from the interior came into my office recently and said he was anxious to possess a certain machine. He had spent a great deal of time fruitlessly in search of it and now desired my advice. I told him two lines in the "Business and Personal" column of your paper would bring him the needed information in a short time, if such a thing existed in the country. He wanted to return home in a day or two and if not successful by that time he would get me to attend to the matter for him. I drew up a statement of the facts, put it in your paper, and, sure enough, by the time your journal got to your readers and a return could reach me I had several letters giving all the information desired. My friend spent time and money in a fruitless search; a one dollar notice in the Scientific American brought it out at once.

A. W. M.

New York City.

Quick-Setting Cement.

Messrs. Editors:—I see that N. U. A., of Mass, enquires for a quick setting and durable cement. I can recommend Scott's Cement for that purpose, it is made into a paste with boiled oil and used in the same way as red lead, the joints are then warmed by putting on steam at a low pressure, which causes it to become quite hard in about three hours. It does not rust the faces of the joints like rust cement, and is much cheaper than red lead. It is much used in ocean-going steamers, and has been known on the other side of the Atlantic for twenty or thirty years. Yours truly, M.

Cincinnati, O.

Plaster of Paris on Millstones.

Messrs. Editors:—Your correspondent, S. J. T., of Ga., asks how to make his plaster of Paris stick hard to his mill stones. The following I have used with success on other articles. First boil the plaster till the bubbling ceases or till quite dry; then mix in a little powdered alum, then mix with water; apply quickly, as it sets rapidly, becoming very hard. Penrose Chapman.

Brunswick, Me.

Recipe for Welding and Restoring Steel.

Messrs. Editors:—For welding cast steel that has been repeatedly overheated, and restoring the same to its former nature, such as machinist's tools, chisels and all other articles, take of nice fine sand, 5 lbs., salt, 3 oz., copperas, 2 oz., as much blue vitriol as will stand on a quarter of a dollar, the same quantity of rosin as vitriol. Use as borax.

Portland, Me. George Jones.

The Science of Ballooning.

A French writer, M. F. Marion, has just issued a work on balloons and aerial voyages, giving a popular history of ballooning from the earliest times to the present day. M. Marion has taken the experiments in aerostatics in chronological order, and bestowed a good deal of pains in presenting his readers with an intelligible view of the improvements which have been made since the first voyage of M. Pilâtre des Roziers, who in 1783 ascended with the Marquis d'Arlandes in a Montgolfier balloon inflated by hot air produced by the burning of straw. An authentic account of the voyage was drawn up on the safe descent of the balloon in the environs of Paris, and was signed by Benjamin Franklin among other persons of distinction. When questioned as to his opinion concerning the utility of the invention, which many there present thought to be already in a state of perfection, Franklin replied, "'Tis the child that has just been born."

Although a great deal has been done, as far as the construction of balloons is concerned, and the method of inflation, we are very much in the same condition now as were our forefathers in everything that relates to steering them. Indeed, it is acknowledged that, with the exception of the possibility which accurate observations may afford of calculating upon and taking advantage of currents of air, there is no hope of our ever being able to control the direction of a balloon in the air; and it remains to discover some method of aerial navigation without balloons.

The services rendered by balloons to science are, however, by no means inconsiderable, and we at least in America know how valuable has been their aid in warfare. It was in 1794 that the French republic first established a corps of military aeronauts. The Committee of Public Safety had accepted a proposition of Guyton's to avail themselves of the services of a young doctor named Coutelle, who had offered to take observations in a balloon. Coutelle experienced much difficulty in carrying out his project. Sulphur being much wanted for powder, the government prohibited the production of gas by sulphuric acid, and Coutelle was obliged to have resort to Lavoisier's process for making hydrogen by the decomposition of water. Ordered to report his invention to General Jordan at Maubeuge, he was at first unable to make himself understood by that officer, who ordered him to be shot as a suspicious character. He managed to explain at length the real purport of his visit. Subsequently he made several ascents with two or three assistants in his balloon, the cords of which were held by the corps under his command. The Austrians repeatedly fired at the balloon, which escaped unhurt, and was subsequently successfully employed at the battle of Fleurus, and for taking observations at the siege of Mayence.

Napoleon does not appear to have favored the use of balloons in military affairs to any great extent, a fact which M. Marion is inclined to impute to the ominous circumstances attending the descent of a balloon which, under the direction of Garnerin, the Emperor's aeronaut, was sent up in Paris on the day of his coronation by Pope Pius VII., in 1804. At dawn on the second day it was hovering over Rome, and the inhabitants viewed with consternation the strange body which they saw sailing between the cupolas of the Vatican and St. Peter's. Suddenly it fell and touched the earth twice, and then impelled by the wind rose again, and was finally submerged in Lake Braciano. The place it had touched was the tomb of Nero, and before it had succeeded in regaining its free flight a portion of its crown had been torn from it and left on the tomb.

On the eve of the battle of Solferino an ascent was made by one Godard; but ballooning, as applied to warfare, first began to receive real attention in the war in the United States, where Mr. Allan, of Rhode Island, conceived the idea of communicating with the earth by means of a telegraphic wire. Shortly afterward Professor Lowe sent the first message by this means from the balloon "Enterprise," above Washington, to the President, and an ascent which furnished valuable information to the army of the Potomac was made in September, 1861, under the direction of Mr. Allan. Ballooning is at the present time extensively practised in Paraguay with a great deal of success, and has afforded great aid to the Brazilian commanders in overcoming the difficulties attending the manœuvres of an army in that flat and densely wooded country.

The plates in this volume are by M. P. Sellier, and are as well executed as they are curious and appropriate. The simple unsightly machine of the present day, which we know as a balloon, is a very different thing to the gorgeously decorated and magnificently colored globe in which the Marquis d'Arlandes and Pilâtre des Roziers made their first voyage.—*Evening Post.*

A Musical Prayer Book.

In Philadelphia, one pleasant Sunday evening, an old lady whose failing eyes demanded an unusually large prayer book, started for church a little early. Stopping on the way to call on a friend she laid her prayer book on the center table. When the bells began to chime she snatched what she supposed to be her prayer book and started for church. Her seat was at the chancel end of the gallery. The organ ceased playing. The minister said: "The Lord is in his holy temple, let all the earth keep silence before him." In the effort to open her supposed prayer book, she started the spring of the music box which she had taken instead. It began to play—in her consternation she put it on the floor—it would not stop—she put it on the seat, it sounded louder than ever. Finally she carried it out, while it played the "Washing Day," an Irish jig tune.

The dollar weighs $412\frac{1}{2}$ grains; of these $41\frac{1}{4}$ grains are copper. The copper is one ninth of the silver.

The Profession.

The true engineer is so imbued with the faith in the greatness and abstract goodness of his profession, that he can hardly believe there can be too many engineers. The essence of all engineering is thought, and that of the most valuable kind, not only when regarded in its material aspect, but valuable also when considered in relation to its beneficent and Christianising tendencies. Half the world, possibly nine-tenths, still believe, and will always believe, in mental apprenticeship, and in the routine of mental impartation; in other words, that a youngster of average dullness can, by pupilage, become a good routine engineer, and thus gain a a living for himself, as the be-all and the end-all of his profession. As well might we apprentice a youth to Tennyson that he might become a poet, or to Gustave Doré that he might become a painter of the grand and the terrible. Engineering has its thousand formulæ, and these any studious mind, of a practical turn, may master; but the mastery of all of them will not make the engineer, in the higher sense of the term. With their knowledge alone he may become a private, or even a non-commissioned officer, but never a captain, still less a general, in the great army of engineers. True, as in all other armies, engineering must have its rank and file, and there will be men who can only know and can only do what they are told, and whose whole idea of duty lies in obedience to command, and we would speak with all respect of these men. The engineer whose own mind is all alive with origination and expedients, and who can gain a given end by a dozen different roads, must always respect his faithful assistant, who, with an undying devotion to duty, will scrupulously carry out his orders, working day by day, and, if need be, night after night, copying, filling in details, tracing, taking out quantities, measuring up work, calculating strains and resistances, performing, in short, all the routine of design, and that contentedly at from 30s. to three guineas a week, and who, even with a wife and a little constellation of children, subsists honestly and decently upon his salary, and has generally, if not always, something between him and want. How much the great engineers owe to the conscientious care, the persistent industry, and critical and accurate habits of thought of their assistants can never be fully known; but those who are deep in the experience of our profession know how truly this assistance is indispensable to the success of every great master of our art. To him such assistants—and there are many yet, after all that is said and all that must be admitted of professional degeneration—are what brave and faithful soldiers of the line are to the great general, the victories of whose army are individualised in his own name. None who realize the triumphs of British engineering should forget how much of the brunt and hard drudgery that won them has been borne by the engineering assistants of this kingdom; many of them noble fellows, recruited both from this side and the other side of the border, and from the sister isle. It is these poor fellows, just now, who, while their "governors" are racking their wits to discern the direction of future investment, when new companies will float, and what new phase of engineering will pay, are wondering whether the clouds will ever lift, and whether the great offices in Westminster will ever again be alive with the cheery hum of paying work. The assistant has his own thoughts, and he knows full well that all our modern periodical accesses of national prosperity have been based upon the development of some great material discovery, and that we are not just now in want of new railways, new harbors, new steamships, nor monumental engineering of the grander sort. Even the bolder and original flights of engineering have become tame. There are plenty now who can float a railway over a fathomless bog, or tunnel two miles under a lake, or span a chasm half a mile wide at a single leap, or unwater a mine drowned to its uttermost depths, or take a railway and its rolling stock up an Alpine steep, or put in a pier in a hundred feet of water and mud, or stop a rushing torrent where a sluice has burst in treacherous ground, or perform any one of the hundred miracles which have given such lustre to our profession. We would be glad indeed could we foresee the direction and results of the next great campaign of engineering in the unknown. For the sake of the thousands of our rank and file, who have chosen our profession for life, and who have before now taken its overwork in honest earnestness, incurring all the risks of premature decay, of breaking down long before the allotted time of nature, we would, if we could, point out the precise direction from which they may expect fresh and profitable employment; for the heart always jumps with the nimble and prosperous hand. We can only say, broadly, that great future prosperity must be looked for in fresh discovery and invention, and in this British genius has been too long fertile to allow us to doubt that new and still unexpected sources of wealth will be found. As it has been before, so it will be in time to come, that the improbable and unlikely of to-day, or rather that which but few far-reaching minds can recognize as likely or propable, will nevertheless give the greatest return in general prosperity.—*Engineering.*

The Names of Coins.

At the present time, when the acts of the "International Committee for a uniform currency," have excited so much interest in all parts of the world, and particularly in the United States, perhaps a few words in reference to the names of the coins now, or formerly in use, may be of interest.

The American dollar is derived from the German "thaler" (literally, "Valley piece," the first thalers having been coined in Goachimsthal, in Bohemia, where there are extensive silver mines). The same name is also used in Sweden and Denmark, where the unit of currency is called a rixdale or royal dollar. As for the sign or abbreviation of dollar ($), authorities are divided as to its origin, but it is generally admitted that $ was originally written with the S on the U; but for the sake of celerity, it was considered to be expedient to change the U to two strokes through the S, which has remained the accepted sign.

The American mill, cent, and dime, the French centime and decime, the Italian centesimo, the South American centaro, are terms derived from the Latin, denoting the thousandth, the hundredth, ard the tenth part of the unit of currency. When the Italian cities were at the hight of their power in the middle of the sixteenth century, their coins naturally spread over the world, and their names were taken for the coins of many other countries, thus the world-renowned Florentine *florin* (in Italian florino, so called from the flower, the lily of Florence, being on the reverse of every coin) was adopted by the French and English, who also give the same name to the German coin *gulden*—derived from geld money. The Venetian *sequin*, in Italian zecchino—from *zecco*, a mint—was adopted by most of the Oriental countries with which the Venetian merchants trafficked.

The Milanese ducat was taken into France and Naples when the armies of these countries overran Milan. The Neapolitan *carlino* is a small coin, with the head of Charles on it. The Roman *scudo*—in French—took *écu* its name from the *shield* originally placed on this coin.

Another Italian coin which spread over Europe was the Roman *grosso*, called in England a grote, in France a *gros*, in Bremen a grote, and still retained in Prussia and Saxony as a little groat or *groschen*. The French *sou* is evidently derived from the Italian *soldo*, or piece with which one can solde or pay one's debts.

The Hanseatic towns also furnished coins, witness the *mark*, so called from the Government *mark*, that it was of good weight. The *schelling* of Hamburg was adopted in England, where it is called a *shilling*, and also by Denmark and Sweden, where they call it a skelling.

Many coins derive their names from the marks or signs, printed on the reverse, and retain the name, although the sign may have been disused. Thus, a coin which has a crown on the reverse was called an *écu* in French, a *crown* in English. A piece which had a cross on it is called a kreuzer in Germany (from the German word kreutz—a cross); although no signs of a cross can be discovered on the modern kreutzer.

The English "pound" was originally a pound of money; but it has been gradually reduced to present form, and called a "*sovereign*," from the sovereign's head being on its face.

In France, during the reign of Louis XVI., there was a coin called a *livre*, or pound, which the republic adopted as the unit of currency, changing the name to that of *franc*, which it still retains.

When the Kingdom of Italy, and more recently the Papal States adopted the French system, they retained the old name of *livre*—in Italian, *liva*, and made that the unit of currency, so that the *franc* of France, and the *liva* of Italy are of exactly the same value.

The "Napoleon" or "Luis," of the French is simply a conventional name given by the French to a twenty franc piece; in the same manner as the Americans call a ten dollar piece an "*eagle*," and as the Prussians have a "*Frederick*." The English guinea derived its name from the fact that the gold from which the first guineas were made came from the Guinea Coast. The English *farthing* is so called from its being the *fourth* of a penny; the derivation of the Spanish *cwarto* is the same, the cwarto being the quarter of a *real* or royal piece.

The names of the South American coins are mostly of Spanish or Portugese origin; the peso, or Reru, is a piece that *weighs*, from *pesar* to weigh; the *centaro* is the hundredth part of the unit of currency, and the *rei* of Brazil is a royal piece. From the above mentioned facts it will be seen that the tendency of all nations has been to adopt the coins of other nations; witness the groat which traveled from Italy to England, France, and Germany.

Sometimes the value was altered, for instance there is a florin in Bavaria worth 40 American cents, and divided into 60 kreutzers, while in Austria there is one of the value of 50 American cents, divided into 100 kreutzers.

To give an idea of the difficulties a merchant doing business with Germany has to encounter, it must be remembered that there are five distinct coinages in use in that country, namely: Prussia and Saxony who use *thalers*, worth 75 cents, divided into 30 groschen; Hamburg, with marks of 30 cents, divided into 16 schillings; Bremen, with its *groten*, and Austria and Bavaria before mentioned.

In Italy the same state of things existed until the establishment of the Italian Kingdom in 1860. Several years ago the French Government proposed to the States whose coinage was the same as hers, namely, to Belgium, Switzerland, and Italy, that the coins of one should pass without dimunition of value in the territory of each of the others. This proposal was immediately accepted by these countries, and by Rome some time after. It is this arrangement, called in Europe "La Convention Monetaire," which is is proposed to extend so as to make a universal currency.—*Cor. Commercial Advertiser.*

Bronzes.

The art of casting in bronze is of great antiquity; it is stated to have been practiced by the Eastern nations long prior to its introduction into Europe. The Chinese historians say that Yu, who was associated on the throne with Chun, 2,200 years before the Christian era, caused nine brass vases to be cast, upon each of which he had engraved the map and description of the nine provinces of the empire. That the art was much practiced by the ancient Greeks and Romans, and that they attained to the greatest perfection in it, is well proved by the celebrated monuments of their work which remain. The finest collection of ancient bronzes is at Naples; among the specimens there are some showing the very curious manner in which the ringlets of hair, worked separately, were fastened on; many of them are the size of life. Bronze casting in Greece seems to have reached its perfection about the time of Alexander the Great (330 B. C.) The accounts given of the works executed about that time almost exceed belief. After Lysippus, the favorite sculptor of Alexander, who executed, according to Pliny, about 600 works—the art began to decline in that country.

The taste of the ancients was still preserved in Italy in the fourth and fifth centuries, and many important works in bronze casting are recorded as having been achieved by them at that early period. In France, Germany, and England, objects cast in bronze have also been discovered in the tombs of the fifth, sixth, and seventh centuries. During the three following centuries this art seems to have declined, and been little practiced in the Western countries, for we read of no great works being produced by it until the beginning of the eleventh century, when it was revived in Germany under St. Bernard, Bishop of Hildesheim, who had the gates of his church cast in bronze, and who erected, in the year 1022, on the space of it, a bronze column about fifteen feet high, ornamented with bas-reliefs ascending spirally from the base, depicting the life of Christ, in twenty-eight groups.

In France, the revival of this art was of a still later period, the earliest evidence of it being the gates of the church of St. Denis, which were cast in bronze under the direction of the Abbot Suger in 1140, and were enriched with bas-reliefs illustrating Christ's Passion and Resurrection.

Italy furnishes no important evidences of the revival of bronze casting prior to the end of the twelfth century, when Bonano produced the bronze gates of the cathedral of Pisa, and soon after those of St. Martin of Lucca, the large gates of the cathedral of Monreale were also executed by him, and bear his name inscribed on them. Many of the objects used in religious services in Germany, France, and Italy, were made in bronze during the twelfth century, such as candlesticks, candelabra, baptismal fonts, and some of the vessels for the altar. Important specimens of the work of this period are still to be seen in the different churches. The Medieval and Renaissance periods also produced for the same purposes numerous specimens of bronze casting; but as these pieces were always more or less enriched with precious materials, they belong more especially to the goldsmith's art.

Italy possessed, in the sixteenth century, a great number of celebrated artists, who designed and executed with incredible rapidity, statues, groups, monuments, and fountains in marble and in bronze. There were many also who reproduced in bronze, miniature bas-reliefs and statuettes, either from the antique or from the works of cotemporary masters. Florence was most renowned for these works. The pupils of John of Bologna reproduced, in bronze, statuettes of the numerous works of their master. Many of these beautiful statuettes and fine bas-reliefs are found in the collection of the present day, and are much sought for by amateurs. These artists did not disdain to employ their talents on the improvement and decoration of objects of ordinary domestic use; in the museums and private collections of the present day there are many beautiful specimens of their work, such as candlesticks, firedogs, knockers and handles for doors, inkstands, etc., which are justly valued as objects of art.—*London Builder*

The Pickpocket's Art.

If we are to believe a writer in the *Revue des Deux Mondes*, the art of picking pockets has been carried by the thieves of Paris to a perfection which must excite the envy of the rascality of London. It should be observed, by the way, that the English word "pickpocket" is now naturalized in the French language; perhaps because this particular form of plundering was, until lately, a comparatively rare crime in Paris, or more probably because it was comprehended in the class of thieving in general. At any rate, we should imagine that picking pockets must now be set down as an art requiring the most laborious practice for the achievement of its highest flights, if the skill with which it is accomplished in the Parisian omnibuses is to be taken as a sample of the perfection already attained. We are told that the thief, of course well dressed, enters the omnibus armed with a very small morsel of lead attached to a very fine thread of black silk. The extremity of this thread he holds between his forefinger and thumb, and as soon as his nearest neighbor takes out his or her portmonnaie for the purpose of paying the fare—which is paid in Paris on entering the omnibus—the thief, his eyes of course apparently fixed in contemplation on some far-off object, dexterously launches the bit of lead into the port monnaie just as the owner is closeing it. The purse is then returned to the pocket of the unconscious owner, who never sees the thread, by which it is now in the power of the thief. As soon as an opportunity offers, or is provided by the thief himself, who tumbles, apparently clumsily, against his neighbor at the first stoppage of the omnibus, the purse is gently withdrawn from its owner's pocket, and transferred to that of the rogue, who as soon as possible leaves the conveyance, with a polite salutation to his victim and the rest of the travelers. The feat certainly does seem to border on the incredible. Nevertheless, it is vouched for on the most respectable authority, and after all is not more wonderful than the feats of Indian jugglers of common skill.

THE models in the Paris Exposition show that Denmark was the first to adopt the principle of breech-loading, and also of rifling. The oldest rifled gun dates from the middle of the eighteenth century. It is made of gun metal, is a muzzle-loader, and has a length of five feet. It has eleven grooves of a partly circular form, and nearly an eighth of an inch deep.

Convenient Appendage to the Cooking Stove.

The device represented in the engraving is intended for the convenience of the cook, and appears well adapted to save many unnecessary steps and much time now wasted. The engraving very plainly shows its construction and appearance when in use. It is simply a series of shelves arranged around the stove funnel within easy reach of the cook, and designed to hold cooking utensils, table ware, and stove implements. A cast-iron ring, either whole or in parts, is attached to the pipe by rivets or other means, and fastened and resting on it are several annular plates which can be rotated. To these the shelves are secured, which may be made sufficiently strong to support any weight it may be desirable to place upon them, although they may be further supported and strengthened by braces. The shelves may be circular, polygonal, or of any form desired, and may be furnished with hooks for suspending such articles as skimmers, shovels, etc. The advantages of this device are sufficiently obvious.

It was patented July 23, 1867, by John Turner, who may be addressed relative thereto at Marshalltown, Iowa.

TURNER'S STOVEPIPE SHELF.

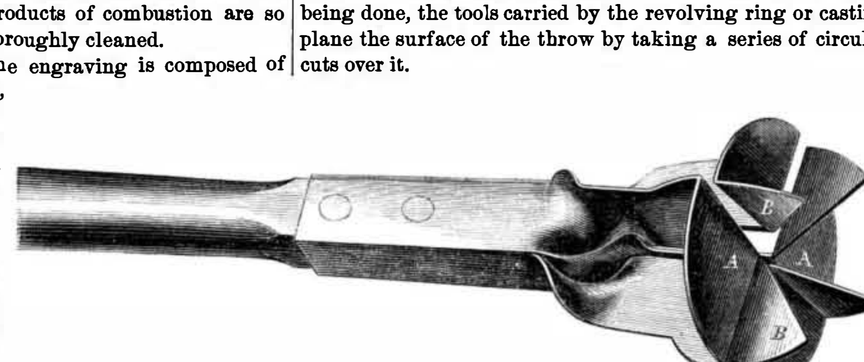
The Lucimeter.

The various ways of measuring the quantity or intensity of light have always been a matter of paramount interest to philosophers. The earliest contrivance, and certainly an excellent one, due to Count Rumford, consisted in intercepting the light received from a given source, by means of a certain number of plates of dulled glass; the smaller the number required to make the light disappear, the smaller, of course, was its intensity. This was called a photometer. Others have since been constructed on various principles, but they are not generally applicable to one of the commonest problems that occurs in trade —viz., measuring the quality of burning oils by their illuminating power. This, *Galignani* informs us, has now been satisfactorily accomplished by M. Guérard Deslauriers, whose apparatus, which he calls a "lucimeter," consists of two constant-pressure lamps, and a photometer constructed on a new principle. Its shape is triangular; it is made of sheet iron painted black, and varnished, and is divided into two equal compartments. The latter are turned toward the lamps; the observer stands on the opposite side, which presents nothing but a flat vertical surface pierced with a hole bisected by the partition. Each of the two lamps is so placed as to transmit its light to one only of the two compartments, and exactly to the part where the hole is. The latter is covered with a piece of transparent paper on which, therefore, the rays of light from the two lamps are contiguously depicted. If their intensity is the same, the eye of the observer will perceive no difference; if there be any, on the contrary, one of the lamps must be brought nearer or removed further off, until the same intensity be obtained. The difference of distance will then mark the relative qualities of the two oils; which, combined with the quantity burnt in a certain time, is sufficient to determine their marketable value.—*Mechanics' Magazine.*

Improved Implement for Cleaning Boiler Tubes.

The brooms of corn, or wire frequently employed to remove the depositions in the interior of tubes or smoke flues in steam boilers soon wear, and refuse to support the weight of the head and its appendages. Something more rigid and self supporting seems to be needed. In the flues of a horizontal boiler the ordinary brush bears mainly on the lower interior surface of the flue; the upper surface, on which the unconsumed portions of the products of combustion are so readily deposited, are rarely thoroughly cleaned.

The implement shown in the engraving is composed of three or more segmental disks, the arms of which are springs. The blades, A, are in this case quarter circles, each with a projecting lip, B, curved on its outer edge to facilitate its entrance to the tube or flue. These blades are made of steel, spring tempered, and twisted as seen in the engraving, so as to yield readily in two directions. They are made of such a size as to overlap each other, their united edges thus forming an entire circle. It will be understood that the spring of the blades allows them to pass readily all irregularities, as rivet heads, and at the same time to bear against the entire surface of the interior.



VAN AUKEN'S DEVICE FOR CLEANING BOILER TUBES.

Letters patent were obtained for this device, through the Scientific American Patent Agency, Dec. 18, 1866. Van Auken and Blanchard, manufacturers, Binghamton, N. Y., may be addressed for the article, or any further information desired.

Turning the Bearings of Crank Shafts.

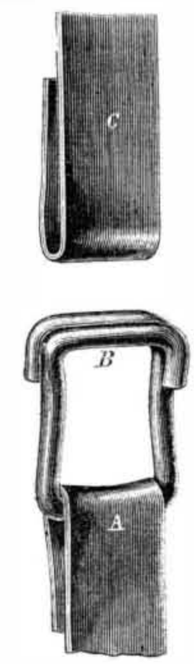
In an account in *Engineering*, of the Society of Engineers' late visit to the far-famed works of John Penn & Son, at Greenwich, occurs the following description of a machine for shaping heavy crank shafts, and turning the crank journals:

It consists of a massive bed—somewhat of a T form in plan —on which the heaviest crank shafts can be secured either transversely or longitudinally. This bed carries a large headstock, in which an annular casting revolves, being driven by suitable gearing. This casting, which is about 6 feet in diameter inside, is furnished with a pair of radial slides, to which tool-holders are fitted, these slides being arranged so that the tools can be set either radially or parallel to the axis of the revolving casting. The exterior of the revolving casting has a V formed on it, one side of this V fitting against a correspondingly shaped surface on the inner side of the headstock, and the other side bearing against a ring which can be adjusted to take up any looseness caused by wear. The headstock has a self-acting, traversing motion along the bedplate, in the direction of its axis, and the tool-holders have also a feed motion on the radial slides of the revolving casting. The manner in which a crank shaft is finished by this machine is as follows: The main body of the shaft is first turned in a lathe in the ordinary way, this being done to facilitate the setting of the work on the machine we have been describing. In this machine the throws of the crank are planed or shaped, and the openings of the cranks cut out, the crank journals or joint being also finished. For effecting the first of those operations, the shaft is placed on the bed of the machine transversely, so that one of the throws stands vertically opposite the headstock, the center line of the shaft being at right angles to the center line of the latter. This being done, the tools carried by the revolving ring or casting plane the surface of the throw by taking a series of circular cuts over it.

The cutting out of the cranks, and the finishing of the crank pins is effected by placing the shaft through the hollow headstock, and adjusting it so that its center line is parallel with, and on the same level as, the axis of the latter, and is distant from it horizontally by the amount of throw of the crank. At the same time, the headstock is brought so that it surrounds the crank to be cut, and the tools, carried by the casting revolving within the headstock, are thus enabled both to cut the opening in the crank, and, when this has been done, to finish the crank pin. One crank having been finished in this way, the work is shifted until the other crank is brought within the headstock. It will thus be seen that the process of cutting out the cranks and finishing the crank pin is just the reverse of turning, the work remaining stationary, and the tools traveling round it. When such heavy masses as large marine engine crank shafts have to be dealt with, it is much more convenient to treat them in this way than to chuck them in a lathe; and in fact, in the case of the largest shafts, it would be almost impossible to finish them by the ordinary process of turning. The consequence is, that these "hollow lathes," as they are sometimes called, are being gradually introduced in most large marine engine works, particularly on the Continent, where they are, probably, more generally known than they are in this country.

TRUMAN'S PATENT COTTON BALE TIE.

It having been shown that iron bands are greatly superior to rope for baling cotton, their use has become quite general, the main difficulty being to procure a handy, convenient, and inexpensive link or tie for securing the two ends of the iron band, and one which will allow the band to be doubled to the required length before insertion in the tie. It is inconvenient to pass the band through a solid ring or a tie punched from a plate and then bend it, the rigidity of the band often preventing it from being thoroughly tightened. If the bearings of the tie where the band passes through are edged or not round, the band under heavy strain may be cut. Furthermore the tie should be complete in itself with no loose parts to be lost or misplaced. Such seems to be the one illustrated in the engraving.



It is simply a bent iron rod and may be likened to a "sister hook" used on shipboard. The loop, A, of the band is passed through the space between the two ends of the hook, B, when it is turned and the loop, C, passed through in a similar manner. The rounding corners of the hook or tie facilitate this operation and when once fastened the square ends hold the band securely.

This tie is certainly cheap, can be easily and rapidly manufactured either by hand or machinery, is readily attached, and sufficiently strong to withstand any strain required. Patented through the Scientific American Patent Agency, Sept. 24, 1867.

All inquiries relative to the device should be addressed to to J. W. Truman, Key Box 21, Macon, Ga. See advertisement.

The Egyptian Lotus.

Mr. William Barr, of Bovina, Warren Co., Miss., says that the Egyptian lotus is to be found abundantly in the lakes of Louisiana and Mississippi. "A beautiful specimen was brought to me during the past summer from a lake on Big Black swamp in this county, the leaf of which was fully two-and-a-half feet in diameter, with a deep, cup-shaped cavity. It bears the largest flowers of any plant grown naturally in this country, with the exception of the *Magnolia Macrophylla.* Barlow, in his *Compendium Floræ*, Philadelphia, 1818, speaks of it as being within ten miles of Philadelphia."

In our issue of October 5th, we published a communication stating that the lotus was to be found in the waters of the Southern and Western States. An old tradition represents that eaters of the lotus forgot all that they had experienced —in fact that wakeful memory was annihilated—and on this Tennyson based one of his most beautiful poems, the *Lotos Eaters.* He uses, as *dramatis personæ*, a company of Greek warriors returning, as Ulysses in Homer's *Odyssey*, from the siege of Troy, cast on an island inhabited by the lotus eaters. He says these lotus eaters, finding the shipwrecked mariners, gave them the lotus to eat.

Branches they bore of that enchanted stem,
Laden with flower and fruit, whereof they gave
To each, but whoso did receive of them,
And taste, to him the gushing of the wave
Far, far away, did seem to mourn and rave
On alien shores; and if his fellow spake,
His voice was thin, as voices from the grave;
And deep asleep he seemed, yet all awake,
And music in his ears his beating heart did make.

They sat them down upon the yellow sand,
Between the sun and moon upon the shore;
And sweet it was to dream of Fatherland,
Of child, and wife, and slave; but evermore
Most weary seemed the sea, weary the oar,
Weary the wandering fields of barren foam.
Then some one said, "We will return no more;"
And all at once they sang, "Our island home
Is far beyond the wave; we will no longer roam."

We doubt the statement made by the imaginative poet, and that which tradition brings us; but there are so many varieties of this plant that it is difficult to determine which was meant in the *Odyssey*, or Tennyson's *Lotos Eaters*, as the statements seem to refer to some narcotic plant which may be only the poppy. A shrub in Africa bears berries which taste like dates, and is called the lotus. Another in Barbary bears a very rich fruit. In the interior of Africa, Mungo Park found a large tree called the lotus, which bore berries having a delicious taste, that, when pounded and exposed to the sun in cakes, made a delicious food. The *Nelumbium Speciosum*, or Egyptian lotus, is an aquatic plant, regarded sacred in the Egyptian theology, and also so regarded in India. What the uses may be of the variety found in this country we are unable to say.