## THE MADSTONE-...A DELUSION.

Our article the other day, in relation to the mad stone, las attracted the attention of Prof. David Christy, formerly of Cincinnati, but now of this city. In a note to us he says:-

When in Southern Illinois, a few years since, I had my aitention called to the subject of the 'madstone,' in consequence of a few cases of persons having been bitten in the neighborhood where I was stopping, by a dog supposed to have hydro phobia. Three madstones were said to be in that section of the country, at distances of twelve, twentyfour and eight miles, respectively. Being at leisure, I resolved to gratify my curiosity by an examination of these marvels. The first I found to be a cross section of a specimen of coral, of the structure presented in the annexed cut. It was about a half inch in thickness, and one inch and a half square. The second one was of the same species of coral, but of greater length. The third was a common pebble of the size of a small apple, and abou
the same shape the depre at the apple being represented by a corresponding one in the pebble, with the addition of a drilled hole, a fourth of an inch in depth, from which, it might be inferred, the stem had been pulled out. I had the good fortune also to obtain, when in Tennessee, a fine specimen of the 'bezoar' stone, taken from the stomach of a deer, killed in the Chilhowee mountain. It seemed to have formed in concentric layers. The outer layer had been broken by the hunter, and was somewhat rough on the outside, but the surface of the next one was as smooth as polished marble, as though worn by attrition against the inner surface of the outer shell from which it was detached-the surfaces of both being equally smooth. When divested of the outer layer, it was about the size and form of a common hen's egg. Its color was a light brown. It had not been used as a madstone, but was imagined to possess great virtues, not yet discovered. I presented it to Prof. Wood, of the Ohio Medical College, Cincinnati. I shall offer no comments on the coral and pebble specimens examined. The virtues attributed to them, of course, were imaginary. I may mention here, that I have witnessed the movements of a black snake in the supposed act of 'charming' birds, and that the facts, carefully observed, take all the poetry out of that popular delusion. At some future time I will endeavor to furnish an article on this subject for your columns."

## Popular Photographs.

An English writer, in speaking of the sale of popular photographs, says:-
" A popular singer or actor or a successful prize fighter will sometimes have a run entering into tens of thousands of copies; but the demand will suddenly collapse and thoir names will be heard no more. Public men, whose names are distin. guished in connection with the pulpit, with literature, science or art, or in the legislature, are in constant demand, notwithstanding that the especial rage of this collection of portraits has within the last twelve months considerably subsided. Royal portraiture is always popular, and perhaps nothing can more strikingly illustrate the loyalty of Englishmen than the constant demand for portraits of members of the reigning family. Just about the period of the marriage of the Prince of Wales, a photographer in Brussels had the good fortune to obtain sittings from the Queen and several members of the royal family, including the Prince of Wales and the Princess Alexandra, and the sale of these portraits exceeded two millions of copies. One photographer alone tn this country has, during the last few years, issued upward of half a million yearly of members of the royal family. After the royal family, the popular statesmen are the greatest favorites; Lord Palmerston, during his life and for some little time after his death, being in greatest demand. If the sale of men's portraits afford any indication of the popularity of their principles, it is tolerably manifest that liberalism obtains very strongly in this country, the circulation of the portraits being in the ratio of ten of Gladstone to one of Derby, who is, however, judged by this
standard, the most popular of the conservatives On the other hand, the portraits of Louis Napoleon and Garibaldi have about an equal popularity, the rage for the portraits of the latter being more spasmodic, and of the former more steady. After statesmen, popular literary men and clergymen are most in demand; and after these, men of science and artists; and lastly, popular actors and singers Bishops seem to circulate by virtue of their rank, the Archbishop of Canterbury having the most extended circulation, while clergymen and ministers are prized only in virtue of their popularity. Mr. Spurgeon was for a time in very large circulation Mr. Binney less extensively, but more constantly.

## MISCELLANEOUS SUMMARY.

Mr. eorge Peabody has given one hundred and fifty thousand dollars to found and maintain a museum and Professorship of American Archælogy and Ethnology, in connection with Harvard University. A like sum has also been donated to Yale College for the foundation of a museum of natural history, especially of the department of zoology, geology, and mineralogy. Of this sum, a part, not exceeding one hundred thousand dollars, is to be devoted to the erection of a fire-proof building, planned with especial reference to its subse uent enlargement, when the bèquest of a building fund of twenty thousand dollars shall have accumulated to one hundred thousand dollars. The remaining portion of this donation is to be invested, and the income from it to be expended, for the care of the museum, increase of its collections and general interests of the departments of science alseady named; the part of the income remaining, after providing for the general care of the museum, to be apportioned as fol lows: three-sevenths to zoology, three-sevenths to geology, and one-seventh to mineralogy.
Old Collodion.-Humphrey's Journal says that old-collodion may be rejuvenated and made useful in the following manner: "Add alcohol and ether in equal parts, or a mixture of one-third alcohol and two-thirds ether is still better-untid the collodion flows easily and is thin enough to coat the plate without streaks ; furthermore, to each quart of col lodion add sixty grains of bromide of cadmium, and put the mixture, after frequent shaking, in a cool, dark place. This collodion probably will become colorless and work as well perhaps as the best new collodion that can be made."
The Michigan Southern and Chicago and Rock Island Companies, jointly, are erecting an immense depot, probably the largest in the country. The length of the building is six hundred and ten feet, width one hundred and sixty feet, and the hight from the track to the highest portion of the roof is about seventy feet. The total cost will be about $\$ 300,000$.
The turpentine product of Butte county, California, where three companies are now engaged in the distillation of that substance, amounts to about four thousand gallons per month. Another product of the coniferous forests of this country, is an oil distilled from the hackmatack,colorless and light as camphene, and valuable as a detergent, cleaning grease spots from the most delicate fabrics without leaving a stain.

A French savant has lately discovered that certain fish contain eggs enveloped in veritable silk cocoons. Each egg measures 35 centimeters long by 13 broad, and weighs 240 grammes, and is covered with silky filaments, which may be employed in weaving.
IT appears from recent experiments conducted by the London Pneumatic Co., that one hundred and twenty tuns of goods can be sent through their eighteen miles of tubes every hour at a cost less than $1 d$. a tun per mile.
The total amount of tobacco produced throughout the world is estimated as follows :-Asia, 309,900,000 pounds ; Europe, 281,844,500 ; America, 248,280,500; Africa, 24,300,000 ; Australia, 714,000 ; making in all $995,039,000$ pounds.

Trie wool clip of Buenos Ayres the present year is estimated at 160,000 pounds, and will be worth twelve millions of silver dollars.
M. H. Micolon, of Paris, proposes a new alloy for the manufacture of all metal articles-bells, hammers, anvils, rails, and non cutting tools. The alloy consists of 20 parts of iron turnings or tin waste, 80 parts of steel, 4 parts of manganese, and 4 parts of borax ; but these proportions may be varied. When it is desired to increase the tenacity of the alloy, two or three parts of wolfram are added. When the cupola is ready, the iron and steel are poured in the manganese and borax, and the vessel is filled up with coke.
A company has been organized, with a capital of $\$ 400,000$, to develop the valuable water-power of the Housatonic River, by constructing a dam 20 feet high, and 600 feet long, near the northern line of Birmingham. A canal is also contemplated on the Birningham side, 50 feet wide, to that village, and another on the west side of the river, 100 feet wide and 7 feet deep, extending from the dam to a point opposite the mouth of the Naugatuck. This one is to be furnished with locks, thus enabling vessels to go up the canal and land or receive freight from the factories on its banks. The company expect to receive a rental of $\$ 80,000$ a year, or twenty per cent on the capital invested.
Krcpp's great steel works at Esseh, Prussia, cover 400 acres of ground, consume 750 tuns of coal daily, use the steam of 120 boilers, burn 7,000 flames of gas, and give employment to above 8,000 men and boys, whose wages amount to nearly $£ 400,000$ a year. The establishment last year turned out upward of 50,000 tuns of cast steel, one-third of which was made into guns, the rest into bars, shafts for engines, axles, railway bars, tires of wheels, plates for boilers and ships.

The electrical power of the Atlantic cable is now furnished by a twenty-cell Daniell's battery. The two cables have been joined, making a line of 3,700 miles, and signals have been passed through this entire distance in a little more than a second of time. The only power used was that given by a battery consisting of a lady's silver thimble filled with acid, into which were placed a bit of zinc and a bit of conper.
The privilege of printing the catalogue of the Paris Exhibition was sold to a Parisian publisher for the sum of one hundred thousand dollars.
Lead Pipe fatal to Fish.-Mr. L. M. Crane, of Ballston, N. Y., who breeds a good many fishen states that it will not do to use lead pipe to conduct the water into the fish ponds. The fish soon die when lead is employed.
Great quantities of pencils are now made in England of a composition formed of sawdust and small pieces of lead, which are ground to an impal. pable powder, mixed with some cohesive medium In Keswick, 250,000 pencils are made in a week, or $13,000,000$ a year, and 12,000 cubic feet of cedar are annually consumed.
Eight million bushels of corn have been exported from New York the present year ; twenty-six million pounds of beef, seventeen millions of butter, sisteen millions of lard, nine millions of tallow and three mil. lions of tobacco.
Rolling Mill Wanted.-We are requested to call the attention of our readers to the advertise ment, in another column, of the Calvert Iron Co., for machinery for a rolling mill.

Dr. A. Hill, of Norwalk, Conn., has invented a simple process by which oil paintings. can be executed on marble, with the colors as permanently fixed as in stained glass.
Nearly twenty thousand boxes of eggs, of one hundred dozen each, arrived in Boston, from Maine, during the year, beside the large quantities received from Canada.
IT is reported that a company at Lyman, N. H., is getting out quartz which yields a larger per centage of gold than the California or Colorado mines. Specimens have been assayed yielding $\$ 36 \pm 40$ to the tun.

A petrified human hand was lately found in red sandstone at Memphis, Tenn., in a perfcet stato of preservation.
Monthly steam communication has been estab lished between San Fxancisco and New Zealand.

## Patent Hoiler Feeder

Force pumps for feeding boilers are not always reliable, and even when the adaptation of the principle and the workmanship of the pump can be depended upon, constant oversight and care is required. For these reasons an automatic feeder for steam boilers has been considered a great desideratum. There are some devices which have been used and are now employed for this purpose, which by many are considered improvements on the ordinary force pump. The engraving illustrates, in perspective, one of these plans which has received strong commendation.
It is an automatic boil er feeder which is oper ated by the live steam of the boiler. The chamber A, revolves on a spindle and is furnished with a toothed disk, B. The chamber is kept in posi tion by means of a nut and a steel washer which is hollow, or concave, and acts as a spring. The face of this chamber abuts on a plate to which the pipes, C and D , communi cating respectively with the steam and water space of the boiler, are connected, and also with the pipes, E and F, communi-
cating severally with the external atmosphere and with a water tank. The chamber, A, is furnished with two apertures, opposite each other, which, by its revolution, aire brought intermittently in contact with apertures in the pipes, C, D, E, and F.
The revolutions of the chamber, A, are produced by means of the pulley, $G$, and pinion, H: The pinion has a portion of its teeth on 'opposite sides cut away to allow the action of the chamber in taking the water to be forced into the boiler, and in expelling the steam contained in the chamber.
One of the apertures being opposite that, of the pipe leading from the water pipe, the other corresponds with the open air pipe, allowing the steam in the chamber to be expelled and the water to fill the chamber. A partial revolution closes these ports and opens those from the pipes, $C$ and $D$, by which the steam from $C$ forces the water through $D$ into the water space of the boiler. This process is repeated indefinitely.
Patented March 13, 1866, by J. R. Widgeon. For additional particulars address Frederick E. Frey, Bucyrus, Ohio.

## Vulnerability of Iron=clads

In our issue of Oct. 20 we briefly commented on the experiments at Shoeburyness, with the Woolwich nine-inch gun and the Palliser chilled shot, expressing the opinion that the London Times was not correct in deducing, from the penetration of the eight inches of iron plating with its eighteen inches of teak backing, the conclusion that the supremacy of iron-clads was ended. We stated that it was doubt ful if the Shoeburyness target was equal in resisting power to our monitor turrets of twelve inches of ron, which could be increased to twenty-four inches.
Mr. John Bourne, in a letter to the Engineering, substantially agrees with these remarks. He says "If the 9 -inch gun, with 45 lbs. of powder, can pierce an 8 -inch plate with 18 inches of teak backing, when furnished with the Palliser projectile, what effects may we not expect from the $13 \frac{1}{4}$-inch, 15 -inch, and 20 -inch guns when firing similar projectiles with from 70 to 120 lbs . of powder? In my opinion, the side armor of modern iron-clads should not be much less than 18 inches thick, backed by three or four feet of oak, and by the monitor system of construc tion this thickness is attainable on a displacement similar to that of the Bellerophon. The turret should be 24 inches thick, and should carry two 20 -inch wrought-iron guns. Such an iron-clad, it might fairly be expected, would remain secure from penetration for some years. But 8 -inch or 10 -inch armor cannot be expected to keep out the shot fired even


WIDGEON'S BOILER FEEDER.
from existing guns, to say nothing of the more powerful guns which the next few years will be sure to bring forth. Why should we leave any thing in doubt in so vital an affair? Why should we, with our knowledge of the growing power of ordnance, so adjust our means of resistance as to be hardly able to withstand even its present force? With our present knowledge of what guns, even of moderate size and with moderate charges, can do, it would be quite inexcusable to allow ourselves to be again taken by surprise in this matter; and I
maintain that any thickness of armor, much less than what I have specified, would be futile, and should not be contemplated at this time of day."

## THE ANTHISTOMETER OR MEASURER OF RESISTANCE.

At a late meeting of the Polytechnic Association Dr. L. Bradley presented the following article in introducing his combined tangent galvanometer and rheostat, an instrument designed for conveniently and accurately measuring the resistance which conductors' of electricity oppose to the free transmission of currents.
The subject of a uniform standard of resistance has long engaged the attention of electricians, but without arriving at satisfactory results.


Wire of a given number, though often made use of, is open to objection, for it is apt to varyoin dimensions and resistance. The standard unit of this in strument approximates one mile of No. 8 iron wire. In construction it consists of coils differing in resistance from one-quarter of a mile to 150 ; which by means of switches, may be increased to 1,200 , and the graduated sliding bar subdivides the one-quar ter of a mile into hundredths. The true tangent galvanometer should measure the strength of a cur rent in circulation, as directly proportional to the tangent of the angle of deflection. Common gal vanometers do not fulfill the requisite conditions for
this, for the adventitious force which is sent through the galvanometer coil never acts with the same uniformity upon the needle in all its deviations as the terrestrial magnetism does, for wher the coil is narrow and the needle long, the inductive influence upon the needle is greatest when at or near the meridian ; but, as it deflects, its extremities pass away from the rays of induction, and its deflections grow less and less, so that the rule is no longer in force. To obviate this difficulty, he first made a coil of four layers whose width equaled the length of the needle; but now the difficulty was in the opposite direction. Upon reflection, the expedient presented itself of making a compound needle composed of several thin flat needles fixed upon a light flat metallic ring, so as to form a complete circular disk having indexes to show the degree of deflection. The compound needle polarized and mounted was found to move with great celerity, and being under the influence of the same number of convolutions in all its deflections, will fulfill the conditions required in demonstrating the theorem that the intensity of currents is propor tional to the tangent of the angles. The following is the verification: Let A M, in the annexed diagram, geometrically represent the force of the terrestrial magnetism which is made the unit of directive force. If an electric current be sent through the galvanometer coil, whose directive force, A B, equals the terrestrial force, the tendency would be to direct the needle in a perpendicular line. If this

force could now be suspended, the needle would point due east and west, but the combined action will direct it to the point, 1 ; this cuts the quadrant at 45 deg., the line M1 being the tangent of 45 deg . which is 1 . Increase the intensity to twice this force, and represent this by the line AC, then the force A M and A C will direct the needle to the point ; 2, applying the quadrant, we find this line cutting the circle at 63 deg. 30 min ., of which the tangent is 2. We may increase the parallelogram erected on A M at pleasure, and the combined forces will al ways cause the needle to point diagonally to the opposite angle, whose hight is the tangent of the angle of deflection. It is generally admitted that the correlation of forces in magnetism is the same as that of gravity, each within its sphere, the former finite, the latter co-extensive with the uni verse. Let us suppose that to a graduated wheel (Fig. 2) we attach a pound weight at $\boldsymbol{\alpha}$, it will take a position in the plumb line. We may consider this pound weight to be a constant unit of force corre sponding to that of terrestrial magnetism in Fig. 1. If we attach at $C$, a force equal to $a$, the two are then related the same as A M and A B, in Fig. 1, and will stand equally distant from the line of centers of gravity at $a^{\prime}$ and $c^{\prime}$, the wheel having turned iust 45 deg. By doubling the force, it will descend to $c^{\prime \prime}$ and the weight $a$ ' will ascend to $a^{\prime \prime}$, that is

