Scientific Museum.

To Dye Ivory.

In many branches of business it is very desirable to know how to color ivory. The red balls of the billiard table, and the red colored chessmen, are evidences that the art of coloring ivory is known to many, but the number is not numerous, and we have not been able to find anything said, satisfactorily, on the subject, in any printed work. The Chinese appear to be the most eminent in making fancy ivory articles, and they color them with great taste, but red appears to be the only color for which they are distinguished, and it is the predominant one—the red and white forming the varieties. We have had our attention called to the subject lately, and we present the following as the result of experiments:—

Red Color.—The hands should be washed in soap and water to free them from any grease that may be on them; the ivory should be washed in some cold strong soap-suds, and then well rinsed in cold water. A clean copper or brass dipper, or any small copper vessel, filled with soft water, should be placed on a fire and kept boiling, with some ground cochineal, for about ten minutes, (about two tea-spoonsful of the cochineal will dye three billiard balls). After it has been boiled for this length of time, add a pinch of cream of tartar, between the fingers, and six drops of the muriate of tin, (if the tin cannot be obtained a little alum will answer); this is all stirred about and the ivory put in. After the ivory has boiled about one minute, it is taken out and dipped in a vessel of clean cold water, and then put into the boiling cochineal for the same length of time, and taken out again. It is thus dipped in and taken out of the boiling cochineal, until it attains a beautiful red color, when it is well washed in warm water, and rubbed over with a white cloth which has been lightly greased. Care must be taken not to use too much cream of tartar or the chloride of tin, for these substances injure the surface of the ivory. Those who do not care about the price of the cochineal, may use four tea-spoonsful, and the ivory will be colored quicker. The greater the amount of dye stuff used the deeper will be the color.

Black.—For this color the ivory should be cleansed the same as for red. An iron or tin vessel may be used to dye this color. Take about four ounces of ground logwood, and boil it for fifteen minutes, then add one-fourth of an ounce of copperas, and put in the ivory and boil it gently for about ten minutes, when it may be taken out and washed. If the color appears slaty (light), more logwood should be added, and the ivory boiled some time longer. The ivory can also be dyed black by boiling it for about ten minutes in the same quantity of copperas as that mentioned, and a little of the bichromate of potash, then airing the ivory and boiling it in the logwood afterwards. When the color is deep enough it must be washed and rubbed with a greasy cloth, when it will appear jet black.

These two colors are the most common in ivory articles, especially the red. Ivory is bleached white by exposing it to the sun, after being washed in soap suds and moistened from time to time, with clean soft water. A little whitening and soap, used together, is a good composition for cleaning the ivory handles of knives. We may refer, at some other time to the mode of dyeing other colors on ivory.

Water Gas.

The discovery of Water Gas, we understand, was made several years ago, and resulted from joint experiments by Dr. Charles T. Jackson, of Boston, and Cornelius Mathews, Esq., of this city—gentlemen who have, in many ways and on many occasions evinced extraordinary inventive faculties, but whose modesty has generally prevented the exposition of their triumphs until others, obtaining intimations of them surreptitiously, have indecently brought them forward as their own.—[Mirror.

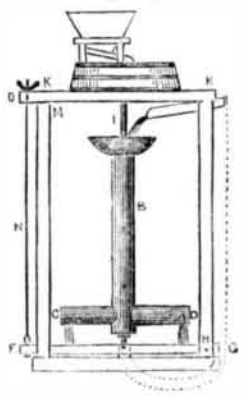
[Did Mr. Mathews, author of some novels, inform the author of the above that he, along with Dr. Jackson, discovered water gas, or did Dr. Jackson do so? Surely neither of them. No man would propagate the above, who had read the most simple elementary work on chemistry. Water Gas was discovered by Lavoisier more than sixty years ago. The whole of the above, we have no doubt, is a joke of the Mirror's.

For the Scientific American.

Hydraulics.

(Continued from page 152.)

Fig. 23.



Re-action Wheels.—In the last number, the experiments of Newton and Ewart, on the re-action of water, were briefly described. It is to be regretted that so much difference of opinion exists upon the subject. The great cause of this must be owing to incorrect experiments—experiments founded on a wrong basis. A great number of experiments, upon a large scale, and these conducted by different individuals, keeping a correct register of every minute circumstance, and the most minute arrangement, would lead to correct conclusions, and establish true principles.

The subject of Re-action Water Motors, Turbines, and this class of machines, is one of great importance, because this class of motors is so numerous in America, and so applicable to the propulsion of machinery in situations where other wheels could not be employed so economically, at least. General information on this subject is too limited and very varied, as may be judged from the single fact, that no less than about thirty patents have been granted for improvements on this kind of wheels. We will present, however, a great deal of what may be new to a great number, and, at least, what may be considered the best illustrated and arranged information to be found in any work on the same subject. We will begin first with the oldest Re-action Wheel, namely, the well-known Barker's Mill. This wheel is represented as driving a grist mill. A is the water pipe to bring the water to the upright tube, B, into the horizontal arms, D C, where the water discharges. These orifices had slides on them, to increase or diminish their diameter. Those wheels which have been constructed in latter years, with moveable buckets for regulating the discharge, have no new application in such an arrangement; I is the spindle of the wheels, it is secured to the tube and arms to turn with them.

The lower end of the spindle is secured in proper bearings—an oil box, or otherwise. The top of the spindle goes square into the eye of the upper mill stone to drive the stone along with and at the same velocity as the wheel. The nether mill stone is secured on the floor, K, and the ground meal may fall through a spout placed at about M. It will be observed that the bearing of the spindle gudgeon, below, is in a bridge tree, G F, which has a pivot, H, on which it moves; and it is supported by an iron rod, N, which passes through the bracket, O, and it has a screw-nut on its top, which, by screwing, raises or lower the mill stone at pleasure. A pulley or a bevel wheel, on the top of the spindle, to drive other machinery, may be applied. While the tube, B, is kept full of water from the pipe, A, and the water continues to run out from the ends of the horizontal arms, the water will revolve, carrying round the millstone. If we suppose four, or six, or more arms to be cast on this motor, and these arms to be curved, instead of being straight, or the two arms to be curved, we shall have almost all the modifications of modern re-action wheels. Far more credit should be given to the Barker Mill than is in general awarded to it.

If the discharging orifices were stopped, no motion would ensue, even though the tube and arms were full of water; the pressure would then be equal against all parts of the sides within.

As early as 1775, Mathon de la Cour, a Frenchman, instead of bringing in the water by the upper spout, A, brought it in by a spout (shown by dotted lines) at the bottom to the horizontal arms. James Rumsey, of Virginia, our ingenious countryman, adopted the same plan about the same time. This was a great improvement, as it relieved the lower gudgeon of the spindle, greatly modified the vertical pressure, and consequently gave the machine a greater centrifugal effect.

Smoky Chimneys and Fire-Places.

The Editor of the Wheeling (Va) Luminary, gives the following as the result of his study of the principles of chimney draught and the application of the principles to practice.

"There are many theories on the subject of chimney building, and many devices to remedy bad construction. Many of the theories are wild, and many of the devices exceedingly unphilosophical. Now there is only one general theory essential in all chimneys, and that is the apportionment of the *throat* to the opening or *draught* of the room, the closer the room the less the throat; always keeping the throat less than the compass of atmosphere admitted into the room. It would be well also to have the fire-place large enough to build in a false wall &c., which will always place the difficulty under control.

Let the chimney be high enough not to be interfered with by adjoining buildings.

Let the fire-place be large enough to admit filling in.

Let the offset in the back-wall be at least one foot above the upper part of the fire-place opening.

Let the throat be contracted, leaving it largest in the centre, until the difficulty is remedied.

If these conditions are met, it matters little about the size or shape of the flue above. This is proved in the building of furnaces when heavy draught is required.

Fire-Places.—In the construction of these there is, especially in cities, a great want of judgment. There are several points to be considered: neatness, or beauty, economy and comfort. In building a house, undoubtedly the first consideration should be comfort, the second, economy, whether we build for ourselves or to rent to others. We regret to say that there seems to be an utter disregard of these in nearly all the houses in the city, and too many in the country pattern after our city fashionables. Small fire-places are all the rage; a little square, deep, low, narrow hole in the wall, hemmed in on all sides with iron casements, is all that is left to be called a fire-place: the result is, 1st, the heat is thrown into the room in a straight line agreeing to the width of the opening, and those only who sit immediately in front of the 8 by 10 opening get the benefit of the fire on one side, while those who sit right and left might as well be some other place. 2nd—An insufficient quantity of heat to warm the room, is thrown out. One-half or two-thirds passing up the chimney, to the disadvantage of comfort and economy.

The next question is, how should they be built? Answer:—high, wide, and deep, so as to admit of filling in with a circular back-wall, presenting a large opening and surface from which to reflect the heat to all parts of the room, and at the same time secure the draft."

The mammoth printing press of the New York Sun, manufactured by Col. Richard M. Hoe, is now in operation, printing 20,000 copies per hour. It is the largest printing press in the world.

The Committee of the New York State Agricultural Society have appropriated $400 to be awarded to such of those members as may successfully compete at the approaching World's Fair.

Wanted,

A copy of the "Digest of American Patents," which was published by the Patent Office about 4 years ago, containing a list of patents granted from 1790 to 1848. By sending a copy of the above to this office, a bound volume of the Scientific American will be sent in exchange, or a reasonable sum will be paid in cash.

LITERARY NOTICES.

"A Guide to the Scientific Knowledge of Things Familiar," by Rev. Dr. Brewer, Master of King's College School, Norwich, England, carefully revised and adapted for use in families and schools of the United States. Published by C. S. Francis & Co., 252 Broadway. The preface to this admirable work truly says, "no science is more generally interesting than that which explains the common phenomena of life." There are hundreds of facts which have become familiar to the world, yet in a majority of instances the reasons cannot be given. This work makes us readily familiar with these facts. We take, by way of illustration, and to more fully explain the character of this "Guide," the following question and the answers given. "Q. What produces electricity in the clouds? A. 1st, The evaporation from the earth's surface. 2nd, The chemical changes which take place on the earth's surface; and, 3rd, Currents of air of unequal temperature, which excite electricity by friction, as they pass by each other,"—and thus it goes on through almost the entire range of the sciences, rendering them comprehensible to the humblest capacity. We say, unqualifiedly, that this is one of the most useful books that has appeared for many years, and while we thank the publishers for a work so intrinsically valuable, we sincerely hope that parents and teachers will use their efforts to introduce it extensively as a text book in schools and families.—Throw the novels into the fire and give place to Dr. Brewer's Catechism of the Sciences. It will do good, and we can but hope that our young friends will reap much benefit from its careful study.

Brown's Angler's Almanac, for 1851, contains many interesting facts and anecdotes for anglers, and is calculated for all parts of the United States. Price 12 1-2 cts. Sold by J. J. Brown & Co., 103 Fulton st.

We have received from Messrs. Dewitt & Davenport the February numbers of Graham's and the Ladies' National Magazines; each is beautifully embellished, and contains choice reading matter. Graham's Fashion Plate is one of the prettiest we have ever seen.

Nos. 32 of Phillips, Sampson, & Co.'s beautiful edition of Shakspeare's Dramatic Works, is issued and for sale by Dewitt & Davenport. It embraces the play of "Cymbeline," and an elegant steel engraving of Imogene. Six more numbers complete the work.

The Photographic Art Journal, Vol. 1, No. 1.; edited by H. H. Snelling, and published monthly at $5 per annum, by W. B. Smith, No. 61 A n st. This number of the journal contains 64 pages of clearly printed matter relating to the Photographic art; also a portrait of M. B. Brady, the accomplished daguerrian artist, 205 Broadway. The subjects treated of cannot fail to interest and instruct all who take an interest in the photographic art. The work, entire, is highly creditable to the editor and publisher, and we wish it success.