Scientific Museum.

For the Scientific American.

Solar Influence.

"The sun's rays," says Herschel, "are the ultimate source of almost every motion which takes place on the surface of the earth. To the varying influence of this grand magazine of heat and light, our globe, in its revolutions and circumvolutions, is ever exposed; and herein have arisen innumerable agents which have continued through all time to modify the face of nature. These modifying causes may be divided into atmospheric, aqueous, igneous, and organic. The former two classes exert a degrading, the latter an elevating influence. The former, were they not counterbalanced by the latter, would eventually wear down the land to a level with the ocean. Atmospheric forces act mechanically and chemically. The degradation of solid constituents is greatly indebted to the abrasion of aerial currents. Frost, also, exercises a powerful influence in modifying the surface configuration of the earth—crumbling down the flinty cliff and giving rise to the ice berg and avalanche, while the receptive and emissive powers of rocks in respect to radiant caloric, lend a powerful aid to the work of decay, called weathering By heat, moreover, are produced those disturbances in the electric equilibrium of the atmosphere, which produce the phenomena of terrestrial magnetism. Aqueous agents exert a more obvious influence in changing this terrene crust. Their mode of action is mechanical and chemical; and their results are distinguished as meteoric, fluviatile, lacustrine, or oceanic. Water, acting through the atmosphere, or by running streams, first circulates in vapors through the air by the efficacy of heat. Igneous agency may exert itself chemically, as in the productions of new compounds, gaseous admixtures, etc., or mechanically, as when it elevates and fractures the superficial substance of the earth. The elastic power of subterraneous fires, relieved by degradation, breaks forth in points where resistance is feeble; and thus, indirectly, the phenomena of volcanic activity is brought under the general law of solar influence. Organic agency presents itself under two heads—vegetable and animal. From unorganized matter plants are elaborated by the vivifying action of solar rays, and become, in turn, the support of animals and the source of those great deposits of dynamical efficiency—coal strata. Animal accumulations are chiefly discernible in the exuvial of shell-fish and coral zeophytes. The construction of reefs is still owing, in a great measure, to the promiscuous aggregation of marine debris, conveyed by tidal currents."

J. W. O.

To Preserve Vegetable Matters for Exportation, &c.

Take potatoes, pare them, and cut them in slices, and immerse them in boiling water for ten minutes. After this, dry them in an oven at about 100 or 120 degs.; they are then submitted to the powerful pressure of a press, when they should be wrapped in tin foil and kept in air-tight vessels until required for use. Peas, beans, &c., may be treated in the same manner. Any vegetable may be dried in an oven at about 125 deg., then ground in a coffee mill, after which they should be pressed and kept in air-tight tin boxes; pumpkins, &c., may be treated in this manner. By these simple directions our farmers may wisely profit. The vegetables may be put into a cotton cloth bag and immersed in the hot water, and a screw or hydraulic press will answer the purpose for pressing. No family in the country need be without a variety of all kinds of vegetables throughout the entire year.

Charcoal.

Wood contained in a vessel entirely closed and exposed to a heat of 752° Fah., undergoes a real fusion; it runs, agglutinates, and adheres to the vessels. After cooling it is found to have lost all its organic texture, presenting only a black shining mass, resembling bituminous coal which has undergone the first stage of fusion. This experiment furnishes us with a simple explanatien of the formation of mineral combustibles. Red charcoal is produced when the wood is heated in a close vessel at 356° Fahr. This charcoal makes the best sporting powder.

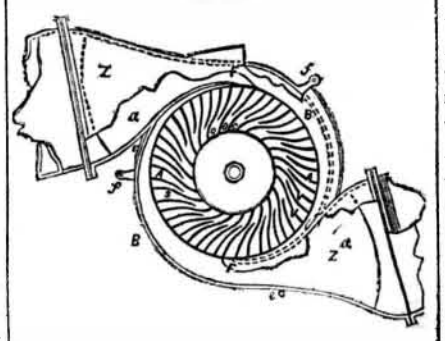
For the Scientific American.

Hydraulics.

(Continued from page 312.)

Thomson's Re-action Wheel.—The accompanying engraving, fig. 54, is a vertical section of a re-action water wheel, for which a patent was enrolled on the 3rd of last July (1851) in the London Patent Office. The buckets are curved. A is the wheel; B is a fixed case with joints. The wheel runs water-tight in this case; *v v* are vanes in the wheel, placed between the top and bottom plates forming radiating passages. The water enters at the periphery, and the wheel is what is known here at a "centre discharge." The whole, along with the shaft, may be cast at once. The inner ends of the vanes are turned

Fig. 54.



backwards, as represented, so that when the proper average quantity of water is flowing through the orifices, *o o*, it may be sent backwards from these orifices with nearly the same velocity as that with which they are moving forwards, so that the water, on leaving the vanes, may have little or no velocity of rotation, but only a motion towards the axis of the wheel. Some of the vanes, it will be observed, stop short and do not run to the centre; "this," the patent says, "is to prevent them from occupying too much space, and impeding the flow of water." [A very erroneous idea; why not have less of them? The point of water discharge should be that of the greatest contraction in a re-action wheel]. The water coming to the wheel flows through one or more of the entrance orifices, F F. Z Z are nozzles, terminating at one end in the entrance orifice, and at the other in the supply pipe. After flowing into the case, the water passes along the inside of its circumference, which is of a spiral form, so that the water is made to enter the wheel with a whirling motion. The water has nearly the same motion in direction and velocity as the circumference of the wheel. The patentee is Mr. John Thomson, engineer, Glasgow, Scotland. It will be observed that the spiral to give the water a whirling motion was employed by Parker, in 1829, in the American patent of that date, only this wheel is a centre discharge, the old American patent was an outward discharge. The form of the buckets of this wheel, has also long been known and used in America. In fact the whole of its features are old in America, but it appears to be a good wheel, and without a knowledge of our American ones, it does the inventor a great deal of credit. He employs a regulator, *a a*, but this is also known here and we have seen wheels with one, two, three, and four water trunks. The sluices are connected to the ring, *e*, which can be raised or lowered by vertical rods attached to it at the ears, *f f*.

[Erratum.—In No. 37, page, 304, at the 38th line from the bottom for *four* times, read *twice* the velocity.]

Cotton Factories South and West.

It has been estimated that there are now in operation in Georgia forty cotton mills, employing near sixty thousand spindles and consuming forty-five thousand bales annually. In this estimate which seems to be below the true mark, no calculation is made of the paper mills, bucket factories, iron establishments, flouring mills, etc. In Tennessee, it has been reported to the Secretary of the Treasury, that there are thirty factories, containing 30,500 spindles and seven hundred looms, consuming fifteen thousand bales per annum. He estimates the capital invested in these establishments at about one million of dollars, and the number of operatives they give employment to at one thousand six hundred. There are in Alabama twelve factories, with a capital of five hundred thousand dollars, containing fifteen thousand five hundred and eighty spindles and about three hundred looms, and consuming about five thousand bales of cotton annually. It is said that machinery for others has been contracted for, sufficient to make the number of spindles twenty thousand and the looms five hundred and fifty. In these three States there are ninety-eight factories and one hundred and forty thousand spindles.

The Screw for Steamers.

In his examination before Lord Jocelyn's steam navigation committee, England, Captain Claxton, whose connection with the construction and sailing performances of the Great Western and Great Britain screw-steamer has gained for him a deservedly-earned reputation, gave evidence in favor of iron steamers and of the screw, which he avers, must, ere many years elapse, be applied universally as the motive power of sea-going vessels. To iron-built vessels Captain Claxton gives a decided preference, the advantages which he ascribes to them being durability, inexpensiveness in repairs, greater capacity, in proportion to tonnage, than wooden vessels, for cargo, healthiness, and in swift sailing. As regards durability, he described the state of the Great Britain, when lying for many months exposed to a series of heavy gales in Dundrum Bay. It was also mentioned that, although the quantity of cockles accumulated on the bottom of the Great Britain since lying in still water at Liverpool was so large as to sell for $27 in the market, no ill effects were apparent when they were scraped off.

Immense Coal Bed.

Mr. J. Dill has communicated to the Family Visitor a brief account of a wonderful deposit of mineral coal at Straitsville, Perry county, Ohio.

"Reports of an immense structure of coal in the vicinity of this place, have long been circulated in Central Ohio. I first heard of it in the winter of 1848-9; it was then reported to be about ninety feet thick. Further examinations ascertained the thickness of the uncovered part, in the face of a deep ravine, at 112 feet. A few days since a gentleman of high standing informed me that an acquaintance of his, with some others, had stripped the upper surface of the bed, and bored through the coal stratum to ascertain its thickness, and found it to be one hundred and thirty-eight feet.

About ten miles south of that mine, I found a vein of carbonate of iron, implanted similar to a slate structure, with an easy cleavage, which is full of well preserved leaves of the coal formation. Some of them on breaking open, exhibit the green of the leaf. The ore, by analysis of Prof. Rodgers, contains 44 per cent. of iron."

Ingenious Invention.

M. Faas, an ingenious German of Philadelphia, has commenced the exhibition of an automaton Tyrolean band of instrumental performers. They are as large as life, and the inventor has succeeded in rendering their movements perfectly natural, while the music performed is admirable. They can be arranged to perform any piece of music in a shorter time than a living band can be drilled into a new overture or march. The figures are nine in number, two being flute players, one clarionette, three bass horns, two trumpets, and one tap drummer. It has cost the inventor ten years of study and labor. We hope when he has them completed, we shall have the pleasure of hearing the dumb whistle once more. We have seen three automatons as large as life discourse sweet music, but ten will beat all predecessors.

Sounding the Gulf Stream.

The United States Sounding steamer Hetzell, Lieut. John Rodgers commanding, has been engaged in efforts to sound the Gulf Stream. At about thirty miles southwest from Key West, bottom was obtained at 730 fathoms; but at another point, the sounding line, at the depth of 3,000 fathoms, was cut off, as was supposed, by a sword fish. The sounding was continued, unsuccessfully, with a line of twine. The Hetzell returned to Key West, on the 8th inst, after a short visit to Havana.

Area of the English Coal Mines.

The coal area of the British islands amounts to 12,000 square miles, being about 1-10th of the entire area of the country; the annual production being 32,000,000 tons.

LITERARY NOTICES.

Iconographic Encyclopedia.—Part 20 of this useful and beautiful work is now published and ready for sale by Mr. Rudolph Garrigue, No. 2 Barclay st., this city: it contains 20 plates of various celebrated architectural structures, both exterior, interior, and plan views; they are beautiful. As we have said before, so we say again, the plates alone of this work render it one of the cheapest and best books ever published.

Books for Railroad Engineers, &c.—We have received from Mr. John Wiley, publisher and bookseller, No. 8 Park Place, this city, "Salt's British Railway and Commercial Information;" "Salt's Statistics and Calculations necessary to Persons connected with Railroads and Canals," and "Bradshaw's Map of the Railways in France, Belgium and Switzerland." These works are valuable and interesting to those engaged on our Railroads and Canals.

Hydropathic Encyclopedia.—We have received the first number of this work, edited by Dr. Trall and published by Messrs. Fowlers & Wells, this city. It is to be issued in 8 numbers of more than 100 pages each: the entire work will only be $2. The object of the work is to bring together in a condensed form, the facts and principles in medicine and its collateral sciences pertaining to the philosophy of life and health. From the number before us, we believe this work to be of a most excellent character.

Dictionary of Mechanics and Engine Work.—No. 31 of this work, by D. Appleton & Co., N. Y., contains articles on the Printing Press, Pumps, Steam and Rotary Punching Machines, Railroads, &c.

Hunt's Merchant's Magazine, for June.—This Magazine has a world-wide reputation, and justly is it deserved. The articles in this number are excellent in every respect.

J. D. Norris, of the "Yankee Blade," will accept our thanks for his kind remembrance. The Blade is one of the best papers going, and we recommend it to all our friends. Mathews, Stevens & Norris, publishers, Boston, Mass., $2 per annum.

"Graefenberg Manual of Health."—By reference to an advertisement in another column, it will be perceived that the price of this valuable work is reduced from 50 to 25 cents. We have spoken in high terms of it several times, and we presume its sale will be very much augmented. We can send them by mail to any of our subscribers who may be desirous of obtaining a copy.