Scientific Museum.

For the Scientific American.

The Climate of Michigan.

A person emigrating from the east or south-east to Michigan, is surprised to find the winters much milder, and autumn later than in the same, or even a more southern latitude, near the Atlantic coast; though settled spring is also somewhat later. The author of this once resided on the banks of the Susquehanna, twenty-three miles north of Harrisburg, and during six years crossed that river repeatedly with a horse and sleigh, on the ice, every winter, during a period of six or eight weeks, and when he came to Michigan, nineteen years since, it seemed strange that scarcely any stream of water here could be crossed on the ice at any time for more than a few days.

There is also a great deal more snow in Pennsylvania than here, notwithstanding that place is at least two degrees farther south than this. Here we seldom have more than from three to five weeks sleighing in any one winter, and very frequently only two or three days; there sleighing may be generally calculated upon for nearly three months every winter; here we have very much cloudy weather, the changes are more sudden, and a hard frost of from four to seven days' standing is invariably succeeded by mild weather and a thaw; there the atmosphere is often clear, the sun appearing to shine through a thin mist, every day alike, for two or three weeks, without making any impression upon the snow even on the sunny side of a house; here we generally have repeated break-ups every winter, there one is generally the limit, and often none.

My object here is to account philosophically for the differences just stated. Let it be remembered, then, that Michigan is nearly surrounded by lakes Michigan, Huron, St. Clair, and Erie, and that there is an immense number of small deep lakes, and many marshes partially covered with water, in the interior of Michigan; and these, as well as the large lakes, radiate heat until the water in them is cooled down to the freezing point, and when a hard frost produces ice, such an immense quantity of caloric is thrown off and becomes sensible heat, (as shown in a previous article on the formation of ice), as to sensibly warm the whole atmosphere, and the heavier the frost the greater the thaw. Besides the great quantity of water in the large lakes, which are 1600 feet deep, is scarcely ever all cooled down to the freezing point, and it therefore continues to radiate heat to the atmosphere all winter, and keeps it warmer than it would otherwise be. But in spring it requires some time to warm this large quantity of water, which makes vegetation late, except marsh grass, which generally furnishes feed early in May. There is, however, one circumstance, pretty uniform, for which I have not been able satisfactorily to account, viz., there is usually a warm spell of a week or two in the beginning of April or the latter end of March, which occasionally brings forward the buds of fruit trees to be destroyed by late frosts; but on the whole Michigan begins to furnish some excellent fruit in considerable quantities, except cherries.

It is well known that western coasts of both continents are much warmer than the eastern. For instance, in Great Britain and at the mouth of the Columbia river, the winters are as mild as they are six or eight degrees farther south on the Atlantic coast of the United States. May not this be accounted for by supposing that the prevalence of western winds brings in the heat radiated by the Atlantic and Pacific Oceans? H. R. Schetterly.

Howell, Michigan.

Moss.

The Louisianians, have by recent chemical improvements, converted the moss which grows in the south in great profusion in the swamps, and is also found hanging in natural festoons from the trees, into an article of high commercial importance. It is more valuable than hair for upholstery purposes.—[Exchange.

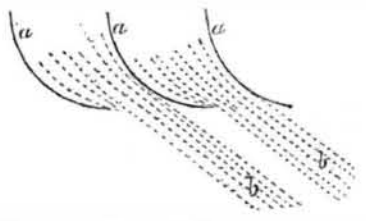
[This moss has been used in upholstering as long as we can recollect; and at the present moment is very extensively used as a substitute for hair; it is used fraudulently and in thousands of instances, by mixing it with hair, which is much higher in price. It is very inferior to hair, because it is more brittle and less elastic. Great quantities of this moss are sold in New Orleans by the Negroes who bring it from the swamps and sell it on Sundays for pocket money.

Hydraulics.

True Theory of the Action of Water on Re-Action Wheels.

[Concluded from page 400.]

Fig. 64.



The Best Mode of Applying the Principles Set Forth.—If water issue out at an aperture pierced through a thin plate, the discharge will only equal about ·62 of that assigned by theory; and if a tube of equal size throughout, whose length is twice that of its diameter, be applied to the aperture, the discharge will be about ·80; but if a cone-shaped tube, approaching in form the contraction of the vein be placed inside of the vessel, the discharge will be very nearly that assigned by theory.

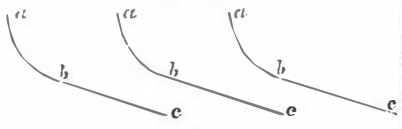
The velocity of water is impeded by short or sudden turns in its direction. Water cannot leave a re-action wheel at a tangent, or in a line with the plane of volition; the effect will be diminished by a deviation from this line, as the cosine of the angle of deviation is to the radius. If water pass through the spaces between vanes to change its direction, the thinner and less curved those vanes are the greater the change in its direction.

In figure 67, *a a a* are the permanent vanes or chutes; *b b b* is the space between the chutes and wheel; *c c c* are the bottoms of the vanes of the wheel; *d* is a cusp of a cycloid; *d e* is a cycloid; *c f* is a tangent to the vertex of the cycloid; *d c f* is a bucket or vane of the wheel.

Fig. 65.

Illustration.—If water pass through the vanes, *a a a*, figure 64, its direction on leaving them will be that of the dotted lines, *b b b*; but if it pass through *a a a*, fig. 65, its direction will be that of *b b b*, a much greater change in its direction. Although the volume of water discharged will be as large, yet the quantity discharged will not be as great at fig. 65 as at fig. 64, in consequence of the contraction of the vane as above. Let the vanes be formed as in fig. 66, the top part, *a b*, cycloidal, and the bottom part, *b c*, plain, tangental to the vertex of the cycloid, and the greatest possible quantity of water with the greatest possible change of direction and velocity, will issue.

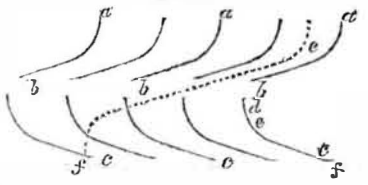
Fig. 66.



To construct a re-action water wheel in accordance with all these principles, form and situate the vanes of the chute and wheel, as in diagram fig. 67. If the water stand with its full height of head above the chutes, *a a a*, it will pass through them into the space between them and the wheel, *b b b*, and be given a direction of that of the wheel with a velocity of ·7, and will issue out between the vanes of the wheel at *c c c* in a contrary direction, with equal velocity as relates to the wheel, but, as the wheel is moving with the same velocity, without actual velocity.

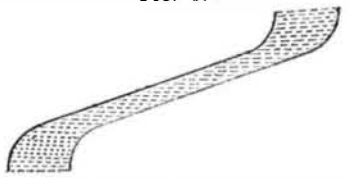
The water, in this case, will move on entering the wheel as near in the direction of the plane of its rotation as possible, and will leave it as near in an opposite one. Its velocity will be the greatest possible, and its change of direction will be such as to impede its motion as little as possible. The actual course of the water will be that of the dotted line, *a c b f*.

Fig. 67.



At *a* its motion will be very slow downwards; at *e* its motion will increase and its direction gradually change; at *b* its motion will commence decreasing and its direction changing downward; at *f* its direction will be down with a velocity only sufficient to give place to the succeeding water. The area of a horizontal section of the collection of water, and its downward velocity will not change during the whole descent from *a* to *c*. (See diagram, figure 68).

Fig. 68.



As the motion of the water is entirely arrested by the motion of the wheel, and as this is done in the most simple and least complicated manner possible—the ratio of effect to power will be as great as it is possible to obtain.

I was somewhat amused on reading the description of "Sawyer & Gwynne's Pressure Engine," in No. 43 of the Scientific American. What is it but the same principle contended for—but carried further—that is said to actuate the re-action water wheel? Where is the difference between this "new motive power" and the centrifuge of Mr. Parker? Or the centrifugal force that we are taught at school actuates the re-action water-wheel?

The term centrifugal being applied to an imaginary force which does not exist, has led many persons into error; there may be such a force as centripetal, as the attraction of the sun on the earth in its orbit; but what is called the centrifugal force is merely inertia—the indifference to motion or rest—the continued resistance of the earth to having its direction changed by the attraction of the sun, and has no relation whatever to a centre, only so far as the centripetal force tends to draw the earth to one. J. B. Conger.

Jackson, Tenn., August 1, 1851.

[We can assure Mr. Conger, that although Mr. Parker uses the term centrifuge, he does not believe there is such an independent power as centrifugal force.—Ed.]

Electro-Magnetic Clocks.

This discovery has been patented at Berlin, by M. Siemens, Lieut. of Engineers, who has associated himself with the astronomical watch maker, M. Ziede, for that purpose. As there exist already at Berlin, electro-telegraphic wires for signalizing fires, the same apparatus will also be used for the clocks. There will be established several leading clocks in the different parts of the town, which, being connected with the wires, will indicate the time on simple dials. The cost of such a clock and wires will be twenty-eight thalers, the subsequently yearly expenses only four thalers. Such apparatus can be applied at any private house, and an additional advantage would be, that all these watches would keep an uniform and exact time.

[The above we take from an exchange, and from its phonetic lingo, it, no doubt, was originally selected from a German periodical. We have seen the same story in a great number of our exchanges. The electro-magnetic clock is not quite, a recent invention. Bain obtained the first patent for one in 1841, and we saw some of his clocks in this city, three years ago. In 1847, one of his clocks moved others 40, 50, and 60 miles distant.

A rich bed of iron ore has recently been discovered upon the land of Major Daniel Bitting, Cumru township, near Lancaster road, about 1½ miles from Reading. It has been tested at several furnaces of Reading, the Gazette says, and is found to flux with more than ordinary ease, without the admixture of other ores, and to yield a heavy per centage of pure metal of superior quality. The deposit is apparently very extensive.

Application for Extension of Patent.

U. S. Patent Office.—On petition of Charles Porter, of Lynn, Massachusetts, administrator of the estate of E. S. Curtis, late of Boston, Massachusetts, deceased, praying for the extension of a patent granted to the said E. S Curtis for an improvement in grist-mills for seven years from the expiration of said patent, which takes place on the twenty-third day of November, 1851.

It is ordered that said petition be heard at the patent office on the second day of November next, at twelve o'clock M.; and all persons are notified to appear and show cause if any they have why said petition ought not to be granted

Persons opposing the extension are required to file in the patent office their objections specifically set forth in writing at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Thos. Ewbank, Com. of Patents.

Voyage Around the World.

The Swedish Government has determined to fit out the corvette Eugene, for a voyage of circumnavigation, and have invited the Royal Academy of Science at Stockholm to nominate a scientific commission to accompany the expedition. A zoologist, botanist, and physician have been appointed by the Academy.