Artificial Cold.

(*Concluded from our last.*)

Where saline substances are cheap, the more powerful mode of refrigeration has been the use of the frigorific mixtures. Some of these mixtures are capable of producing the most intense cold known to philosophy. Dissolving salt petre in water creates a very useful degree of cold; and where the salt is plentiful, as in India, it has long been employed, for this purpose. It was the peculiar duty of one domestic to cool beverages for the table by this means, who received the impregnated solution for his perquisite.—Where, however, snow or ice is procurable the intensity of the freezing mixture rises to its higher points. Snow and salt produce a mixture which was deemed by Fahreheit to be of the greatest possible degree of cold. This was the temperature of his zero. Our confectioners are in the habit of using for their craft, pounded ice and salt. The substance known as chloride of calcium, mixed with snow, produces a most severe cold, sufficiently great to freeze mercury. Mr. Walker, to whose interesting experiments upon this subect, we stand much indebted, was on one occasion able, by successive coolings, to attain a depth of cold equal to 91 degrees below Fahrenheit's unhappy zero. In the laboratory of the chemist, great degrees of cold are procurable by the use of highly volatile liquids for evaporation. Every juvenile chemst's ears have tinged with the startling enunciation of the possibility of freezing a man to death in the height of summer, by wetting him constantly with ether—which is, however, a fact undemonstrated. The sulphuret carbon; and, more recently, liquid sulphuous acid, both of them exceedingly volatile fluids, create intense cold by their evaporaion. The almost magical experiments of M. Boutigny, in which water was frozen in a red-hot crucible, were effected by the assistance of sulphurous acid in the liquid form. The remarkable substance, liquid carbonate acid, takes the highest rank as a refrigorific agent known. Mr. Addams of Kensington, actually manufactures this curious liquid as an article of commerce, and has occasionally as much as nine gallons of it in store. In drawing it from its powerful reservoirs, it evaporates so rapidly, as to freeze itself, and it is then a light porous mass, like snow. If a small quantity of this is drenched with ether, the degree of cold produced is even more intolerable to the touch than boiling water; a drop or two of the mixture producing blisters, just as if the skin had been burned. Mr. Addams states, that, in eight minutes he has frozen in this way a mass of mercury weighing ten pounds.

There have been some mechanical contrivances for the manufacture of ice. Evaporation may be accelerated mechanically to a degree so great as to produce ice in considerable quantities, and this is the principle of Sir John Leslie's celebrated freezing apparatus. In conducting some experiments on the rarefaction of air, he was led to conceive the idea of manufacturing ice on a large scale from a little phenomena observed in the receiver of his air pump. Introducing a watchglass full of water, and in contact with sulphuric acid, into the receiver of his airpump, and on making a few strokes with the piston, the water was converted into a mass of solid! With a body of parched oatmeal, instead of the acid as the absorbent of moisture, he froze a pound and a quarter into ice. Experiments on the large scale followed, powerful machines were constructed, and various improvements were adopted in the apparatus, all tending to facilitate its application to the wants or luxuries of mankind. Several of these machines have been exported into hot climate. Dr. Ure suggested steam as the vacuizing power, and the idea has been conceived, that wherever a steam engine is employed. there an ice apparatus might be erected and sustained at a trifling cost, with great prospect of productiveness.

The most recent ice-machine, is "Master's Apparatus," the principle feature of which is, that a metallic cylinder is made to undergo rapid rotation in a freezing mixture, the motion appearing in a singular manner to expedite and facilitate the process.

Some account of the applications of artificial cold may, perhaps suitably conclude our paper. For some time the ingenuity of men in this particular developed itself no further than in simply cooling wine and other beverages, but a more refined and even elegant mode of doing so, was afterwards discovered. In Boyles "History of Cold," it is stated that he was accustomed to make wine-cups of ice, by means of tin moulds, for use in hot weather, pleasant trifles, as he calls them, which imparted a delicious coolness to the wine poured into them. In an old romance, named the "Argenis," a dinner in summer is described, at which fresh apples half-incrusted with ice, and a basin of ice filled with wine, were among the curiosities upon the table. Then came the invention of waterices, by one Procope, an Italian, who had an immense sale for them at Paris. Cream ices, and the iced juice of fruits, were then made, and found a rapid consumption. More recently, the art of the confectioner has applied this process to imitate many kinds of fruit and peaches—apricots and nectarines of ice—copying the originals with very curious fidelity.

For the Scientific American.

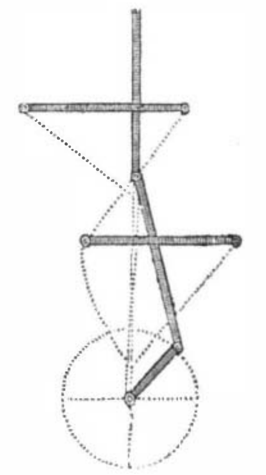
Art of Dyeing.—Drab Color.

This is a color that looks well on coarse goods, or rather makes coarse goods look well, and for country millers, or farmers that have no work among burnt and black logs, we cannot too strongly urge the propriety of having their home made clothes for many purposes, such as vest and pants, of this color. A drab color is just a light brown, but for a beautiful and fast color a very different stuff is selected to dye the drab, from those stuffs employed to dye brown. Crop madder, which is to be found at all the druggists, is the principal stuff. For any quantity of cloth or yarn that the dye kettle may conveniently hold, a small quantity of the ground madder is scalded with boiling water in a clean vessel and set aside to settle. A small dipper full of this along with a little (very little) fustic liquor, and sumac liquor, is put into the dye kettle and when at full boil, the goods are entered loosely (if cloth,) and well handled, (if yarn,) well turned and quickly. In about twenty minutes the goods are taken out, and some more of the dye stuff liquors added, and the same process repeated. This is done until what is called a "full body," is acquired by the goods, when they are taken out and a small quantity of the sulphate of iron added to the boiler, when the top of the boiler is skimmed of its dirty froth, and the goods entered and darkened, or saddened, as it is technically termed, then taken out and washed. If the drab is wanted on the yellow shade, the greater is the quantity of fustic used; if on the salmon, the greater the quantity of madder, and the sumac and iron according to their quantities so are the drabs made dark. Madder alone upon a white ground makes a clear salmon color and it will wash most beautifully, in fact soap seems to have a wonderful effect in beautifying all madder colors. For carpet yarn, a small quantity of fustic and camwood makes a very good drab and also salmons. A little sulphuric acid is used in the boiler to redden or *raise* the color. We do not expatiate on the philosophy or theory of dyeing, although we might, but we give the results of practice, a part in which few of the theorists dare indulge without some risk of scientific reputation. In some parts of our country, we know that there is very fine wool raised and made into large twilled heavy shawls by our farmers' daughters. We have seen some of them a good white and they looked well, others we have seen that were attempted to be dyed with the luck of the leopard's skin. To those who would dye their own woolen goods we say, be very careful to boil and handle well and do not have too great strength of stuffs in the boiler, rather have the liquor *weak* and take longer time to dye, by often taking out the goods and adding a little at a time of the dye liquors.

Madder colors have sadly gone out of fashion much to the injury of permanent colors, both on cotton and woolen goods. As there are various tracts of land and a suitable climate to raise this dye stuff in the United States, it is to be hoped that it will become both a cheaper and a greater favorite of a dye drug. This we hope will be the case for many reasons, two of which are, that it dyes fast colors and with various mordaunts, an endless number of shades from the red to the drab, and the deep purple.

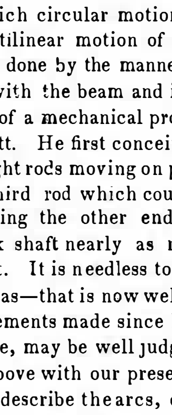
MECHANICAL MOVEMENTS.

Rectilinear Motion and Circular.



This cut exhibits a modification of the method by which circular motion is produced from the rectilinear motion of the old piston rod. This is done by the manner of connecting the rod with the beam and is the ingenious solution of a mechanical problem first applied by Watt. He first conceived the notion of two straight rods moving on pivots connected with a third rod which could turn freely and connecting the other end of the beam with a crank shaft nearly as represented in the above cut. It is needless to say how successful he was—that is now well known—and the improvements made since his day for the same purpose, may be well judged of by comparing the above with our present plans. The dotted lines describe the arcs, circular movements and motions of the crank and rods.

Regulator.



This is a contrivance for regulating the velocity of machinery, proposed by Mr. Brequet, an ingenious Frenchman. The lower wheel being driven in the direction of the arrow carries those above in succession, but the axis of the centre wheel is supported in an elastic piece which is fixed at its lower extremity and acts as a brake on the top wheel whenever the speed or force of the lowest carries the axis of the centre wheel out of a straight line through the three centres.

The Illuminated Vacuum.

Take a tall receiver that is very dry, and fix through the top of it, with cement, a blunt wire; then exhaust the receiver and present the knob of the wire to the conductor, and every spark will pass through the vacuum in a broad stream of light, visible through the whole length of the receiver, let it be as tall as it will. This generally divides into a variety of beautiful rivulets, which are continually changing their course, uniting and dividing again in the most pleasing manner.

If a jar be discharged through this vacuum, it presents the appearance of a very dense body of fire, darting directly through the centre of the vacuum without touching the sides; whereas, when a single spark passes through, it generally goes more or less to the side, and a finger placed on the outside of the glass will draw it wherever a person pleases. If the vessel be grasped by both hands, every spark is felt like the pulsation of a large artery; and all the fire makes towards the hands. This pulsation is even felt at some distance from the receiver, and a light is seen between the hand and the glass.

All this while the pointed wire is supposed to be electrified positively; if it be electrified negatively, the appearance is astonishingly different; instead of fire nothing is seen but one luminous appearance, like a white cloud, or the "milky way" in a clear star-light night. It seldom reaches the whole length of the vessel, but generally appears only at one end of the wire, like a lucid ball.

If a small phial be inserted in the neck of a small receiver, so that the external surface of the glass be exposed to the vacuum, it will produce a very beautiful appearance. The phial must be coated on the outside; and while it is charging, at every spark taken from the conductor into the inside, a flash of light is seen to dart at the same time from every part of the external surface of the phial so as to quite fill the receiver. Upon making the discharge, the light is seen to run in a much closer body, the whole coming out at once.

Glass and Milk.

Glass is very advantageous for milk pans, because it is a non-conductor of electricity. It is well known that the effects of electricity upon milk in tin pans during thunder storms turn it to acid. Milk sealed up in glass bottles will keep for a long time. This is done by filling the bottles with warm milk, turning them upside down in the milk basin and then sealing quickly, so as to allow no air to be in the bottle.

Galvanic Battery.

Alternate plates of zinc and cast iron have been discovered, by Dr. Allam of Maynooth, to constitute a cheap and effective battery, A full grown turkey was killed in half a second, on being touched with the wires, discs of iron, thick pieces of copper, and pieces of the hardest-tempered steel were ignited with the greatest ease.

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