



For the Scientific American.
Poisonous Metals.—Lead.

Poisoning by carbonate of lead not unfrequently happens among painters and white lead manufacturers. The poison finds its way into the system in very minute quantities, causing the complaint known as Painter's Colic—and Paralysis. Dr. Thompson considers that the carbonate of lead is the only compound that possesses evil properties, but this is an error, and Dr. Christisson is of this opinion. The carbonate of lead turns black by being exposed to the fumes of sulphuretted hydrogen.

The most important forms of poisoning by lead, is by the action exerted on it by water. The injurious properties of water conveyed through lead pipes were known in the days of Julius Cæsar. Drs. Lamb, Guyton Morveau, Drs. Thompson and Christisson, likewise Colonel Yorke and Mr. Taylor, have made considerable research into the nature of lead and the action of different waters upon it. Different conclusions have been arrived at by some of these gentlemen, but from their discoveries, it would appear that distilled water from which all gases were expelled by boiling, when excluded from the atmosphere, exerted no action upon lead. But if air which is free from carbonic acid have access, a quantity of white matter is soon formed, which settles at the bottom in the form of a white powder, and is found to be the hydrated oxide of lead. Dr. Christisson says that if the surface of the distilled water be exposed to the air in a leaden vessel, the substance formed consists of minute brilliant scales, which consists of two equivalents of neutral carbonate and one of hydrated protoxide.—Distilled waters therefore cannot with safety be kept in leaden vessels, and the distilled waters of fragrant herbs exert a powerful action upon lead. All neutral salts possess in a greater or less degree, the nature of lessening the corroding power of water; 1-4000 part of the sulphate of lime, 1-3000 of the phosphate of soda, and 1-2000 part of the muriate of soda prevents the carbonate of lead being formed by the action of the air and water. Mr. Taylor asserts, that if 1-5000 part of the sulphate of lime be combined with the water, no carbonate of lead will be formed. Rain and snow water act upon lead almost as quick as distilled water. Water collected from leaden gutters should never be used for cooking. It has been found that most spring waters contain muriates and sulphates and their action upon lead is therefore very small, but prudence would suggest to every one the propriety of submitting all waters to a careful analysis, before conducting it through leaden tubes for domestic purposes. The Croton water that supplies this city is generally considered safe, and no fears of any bad consequence need be entertained from lead pipes if the water is allowed to flow freely before using. It is not prudent, however, according to the analysis of Dr. Chilton, to use the Croton water, if it has stood a considerable time in a lead pipe, or leaden vessel. We believe that there is no substance equal to cotton wool as a purifier of water impregnated with lead. It would be well to use it in the small filters in place of felt. It is peculiar in its purifying nature. The carbonates of lead unite with it chemically, not mechanically, and we need not be surprised at this, after the discovery of gun cotton. In summer the cotton would make a very cheap and easily renewing filtering material, and we would like to see it generally introduced for this purpose, as we are confident that it would be a public benefit.

Dyeing Catchecun Colors on Cotton.

To 10 pounds of cotton goods, boil up 2½ pounds shumac, and steep the yarn or cloth (every dyer knows the manner,) in the liquor for 8 or 10 hours, then squeeze or wring them out and run them through a tub of the black

oxide of iron at 3°, after which, wring them out and clear with soda ley, then wash, wring up, and put the goods through hot liquor of catchecu, at the rate of 2 pounds to the 10 and 2 pounds of logwood, some more, and some not quite as much; there is a great difference in the quality of this eastern drug. Afterwards, run the goods through a solution of soda ley to blue down, as the dyer calls it; that is to take away the brown shade of the catchecu.

Catchecu is most extensively used in dyeing browns and drabs. It is an astringent substance, used in chewing with the betel nut, by the Hindoos.

BROWNS.—To 10 lbs. goods, give 2 lbs. of catchecu as warm as it possibly can be handled, allowing 1½ of catchecu at each run, or giving the goods two dips and 1 gill of the nitrate of copper in tubs, at each dip by itself, then run through a solution of the chromate of potash.

Drabs are done in the same manner as the browns; but sometimes, (as the shade is wanted,) get some sulphate of iron in tubs separate, before getting the chrome, and they are cleared up, first, by running the goods through a tub in milk warm water in which there is about a gill of muriate acid, then washed and run through a tub of soda ley, and then washed and finished.

MADDER BLACK.—The old fast black was done by first immersing in shumac 2½ lbs. to the ten of goods, washing them out and then giving them a dip in the blue vat, afterwards a mordant of the oxide of iron, cleared with soda ley, washed and dyed in a madder bath at the rate of 70 or 80 pounds to the 50 of goods.

Iodine—Bromine—Fluorine.

These substances are not much employed in the arts. Iodine produces, when united with different metals, some of the most beautiful colors; yet, with very few instances to the contrary, it cannot be employed in the art of dyeing, as all these colors are fugitive. Its use is chiefly confined to medicine, as it is found to promote in a remarkable degree the action of the absorbents; in over-doses, however, it is an iritant poison. It is also used in the *Daguerreotype* and *Talbotype* processes.

Bromine is the only simple body besides mercury that exists as a liquid at the ordinary temperature. It is about three times as heavy as water, and of a red color; the only application of this substance in the arts, is for the quickening of the process in taking photographic portraits, by *Daugerre's* system, and fixing the impression in *Talbot's* method.

Fluorine has never been obtained in an insulated state, for its power of combination is so great that no body has as yet been found capable of resisting its energetic action. It may be obtained in combination with hydrogen from fluor spar (fluoride of calcium), by the action of sulphuric acid, heat being at the same time employed to raise its temperature to about 200°. A gas is then given off, which is this compound of fluorine and hydrogen—(hydrofluoric acid.) This gas is easily condensed into a liquid by refrigeration. The liquid acid thus obtained, is the most corrosive acid now known; it acts on metals energetically, but has no action on lead or silver. The retort from which it is distilled, as also the receiver and bottle intended to contain it, must, therefore, be made of either of these two metals. A glass vessel would be speedily dissolved by it. It is used for engraving on glass. In using the strong acid, great caution should be observed not to spill it on any part of the body, as its corrosive nature is such that fatal consequences might ensue were it not instantly washed off.

Floating Iron.

Dr. McCurdy, of Alabama, has lately been lecturing in Mobile and exhibiting iron rendered floatable by some recent chemical discovery.

We hope he will visit these quarters. It will not accord with theory, that a lighter body can support a denser body of equal bulk, and in that case, our opinions regarding floating solid iron, must remain in *statu quo* till we see for ourselves. Iron ships float, but the Dr. as we understand it, can rival the old witches that used to float horse shoes and cart wheels.

History of the Rotary Engine. Prepared expressly for the Scientific American.

WHEEL ROTARY STEAM ENGINE.
FIG. 48.



This is a kind of rotary about which there are some doubts respecting the author. It is claimed by one as a French and by another as an English invention of one Mr. J. White.—There need not be much war, however, about its value, as any person can see at a glance.—It consists of two broad fluted wheels confined in a steam tight case. A A, is the case, and B B, the fluted wheels. The wheels are made so as the teeth fit exactly into one another and the opposite sides of which in turning work steam tight in the case, which is made to suit the circle described by the wheels. At C, the steam is pressing on the extremities of the wheels. D, is a division to keep the steam from exerting its force when the rollers join at the middle. E, is the steam, and F, the exhaust pipe.

This rotary was also proposed for a pump as well as a steam engine and is described in *Ewbank*, also in the *Mechanic's Magazine* of 1825. It is very evident to any observing man that one wheel with the teeth for pistons, would answer a far better purpose than the two herein represented, there would be less friction. It has been the great fault of rotary engine inventors, to forget that steam is not of a nature to run round about like a cart wheel. It has a tendency to move in a straight line and exerts a force in a straight line like a projectile, when admitted from the boiler pipe.

Neutralization of Putrid Miasmata.

In 1773 the Cathedral of Dijon was so infected by putrid exhalations, that it was deserted altogether, after unsuccessful attempts to purify it.

Application was made to Mr. Morveau, the celebrated chemist, and at that time Professor of Chemistry at Dijon, to see whether he knew any method of destroying these exhalations.

Having poured two pounds of sulphuric acid on six pounds of common salt, contained in a glass vessel, which had been placed on a few live coals in the middle of the church, he withdrew precipitately and shut all the doors. The muriatic acid gas that came off soon filled the whole Cathedral, and could even be perceived at the door; after twelve hours the doors were thrown open, and a current of air made to pass throughout the place to remove the gas. This destroyed completely every putrid odour.

But the advanced state of science has shown that the disinfecting agent in the above experiment of Morveau was chlorine, and to effect the same purpose, chemists now make use of this gas, (chlorine), condensed by lime from which it can be set free as required, either by heat, or any dilute acid.

Horse Taming.

A horse tamer named Offut, has created quite a sensation in Columbus, (Geo.) by some of his feats. The Democrat thus records one of them:

"Col. James C. Holland has a wild foolish animal that would never suffer him while riding to come near the tap of a drum. He was slow to believe that Mr. O. could do anything with her, but it took only a few moments for the latter to enter the stable, saddle and bridle the filly, and cause her to follow him quietly out, he beating a drum a few paces in advance. He then mounted, with the drum in his hand, beat the same while on horseback, then dismounted and tied up the reins, causing this now docile animal to follow him like a well trained soldier at the sound of music, and obedient to every word! This and other

experiments were witnessed by several citizens, to their entire satisfaction."

Longevity of the Damask Rose.

There is a rose-bush flourishing at the residence of A. Murray McIlvaine, near Bristol, Pa., known to be more than a hundred years old. In the year 1742 there was a kitchen built, which encroached on the corner of the garden, and the mason laid the corner stone with great care, saying "it was a pity to destroy so pretty a bush." Since then it has never failed to produce a profusion of roses shedding around the most delicious of all perfumes. Sometimes it has climbed for years over the second story windows, and then declined by degrees to the ordinary height. The fifth generation is now reigned with its sweets. Not far from this venerable bush, is a tree, of the same age, now measuring 35 feet circumference—a Buttonwood

Another pretended Cure for Hydrophobia.

At Udina, in Friule, a poor man lying under the frightful torture of hydrophobia was cured with some draughts of pure vinegar, given him by mistake instead of another potion. A physician at Padua got intelligence of this event at Udina, and tried the same remedy upon a patient at the hospital, administering to him a pound of vinegar, in the morning, another at noon, and the third at sunset, and the man was speedily and perfectly cured.

Cure for the Bite of the Rattlesnake.

Dr. James Whitney, of Woodford, Co. Ill., states that he has successfully in a number of cases treated the bite of the rattle snake with the tincture of iodine of the strength sold by druggists. He painted the part that was bitten as far as the swelling extended with four coats of the iodine, first, four coats before going to bed, and four in the morning, and afterwards physiced well. He believes that the iodine being absorbed by the system, comes in contact with the poison and neutralizes it. The wound is kept open during the treatment.

Snow Balls in Horses Feet.

It is stated that soft soap, well rubbed into the bottom of hoofs when clean, and before the horse leaves the stable, will prevent the collection of balls of snow. This is no doubt true to a certain extent, that is, as long as the soap lasts.



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