

the issue of National Bank currency through the year has superseded the circulation of State Banks, converted into National Banks or wound up altogether, so that it is safe to assume that the volume of paper money of all kinds in circulation has been materially lessened since Sept. 1, 1865. The compound interest legal tender notes have ceased to circulate from hand to hand, as money, and have now no other function to perform in our financial system, except that they are held as a reserve by the National Banks. On the whole, we think we have reached the maximum amount of paper money circulation.—*Shipping and Commercial List.*

#### POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, Sept. 21, 1866, the President, Prof. S. D. Tillman, in the chair.

#### LIME IN THE PURIFYING OF COAL GAS.

When the approach of cholera was apprehended many complaints were made against the gas works of this city on account of the noxious odors arising from their premises, caused by emptying, for removal, the lime which had been used for purifying the gas. The evil was apparently remedied by inclosing the lime and conducting the odor through a pipe into the upper air.

The paper on this subject proposed the more effectual plan of thoroughly incorporating dried peat with the lime, thus absorbing the odors, when the composition might be sold as a fertilizer. It was remarked by the members that in London, during the prevalence of cholera, the workmen in the gas houses preferred taking their families there for safety, as no case of cholera had ever occurred among any employed there.

#### DYEING OF WOOD.

A communication to the Institute was read, describing a process for expelling air from the tissues of common pine wood, and injecting any of the aniline dyes. By this means lumber can be uniformly dyed throughout, in imitation of the valuable woods, and then wrought into articles of furniture.

#### VENTILATION AND RESPIRATION.

This was the regular subject for the evening, having been continued from the last meeting. The principle was then stated, that the rising of a balloon, and the draught of chimneys were owing simply to differences in gravity.

When the air comes in contact with the fire, the oxygen unites with the carbon, the nitrogen is released, it expands and becomes the vehicle by which the products of combustion are carried off, and this produces the draught of the chimney.

In the same way, the air is taken into the lungs, the increase of temperature expands the nitrogen, and this, again, carries off the products of the internal combustion. When the thermometer stands at 98 degrees, the difference between the external and internal temperature is not sufficient to produce breathing except under difficulty from the necessity of making use of some muscular exertion, and this causes the difficult breathing, particularly noticeable in young children.

In relation to ventilation, the trouble was not so much how to get the foul air out of a room, as how to get the fresh air in without incommencing any by having a current blowing upon them.

Where the top of the window is lowered, a comparatively solid body of cold air comes in and mingles with the heated air only to a limited extent; by dividing up this column of air, the mixing would be much accelerated, while no decided current would be produced. To accomplish this it was proposed to insert into the open window a board having a number of tubes connecting with the air outside. The subject was discussed pretty fully, but the hour for closing having arrived, further debate was adjourned till the next meeting.

By an imperial edict, native Japanese artisans wishing to visit any of the various countries beyond the sea, for the purpose of learning any science or art, will receive permission from the Government on application.

[From the American Journal of Photography.]

#### Porcelain Process and Developer.

BY WILLIAM HADDOCK.

**PORCELAIN PROCESS.**—Some time since, I sent for this Journal an account of the use of a chloride collodion for negatives; and I now make another application of this chloride—for porcelain, that I wish you would try, and if it suits, give it to the fraternity.

Ether, 4 ozs; alcohol, 3 ozs; gun cotton, 40 grs; nitrate of silver, 32 grs.

Dissolve the silver salt in the water and add to the collodion; then add the chloride a few drops at a time, shaking until it becomes quite milky. Then add twenty-four grains of chloride of uranium, and eight grains of citric acid, dissolved in alcohol.

After coating the plate, and when dry, fume it, the same as paper, and you will find that it prints about as fast as paper, and is rich in tone.

I have an impression that it can be used for solar work in making large porcelain pictures. Why not?

For the preliminary coating, I use the following: Albumen, 1 oz; ammonia, conc., 2 drms; water, 12 ozs.

And by the way, should you want to use this for negatives, put five grains of iodide of potassium in it, and you have a fine coating for negatives that will keep a long time, and will dry as hard as flint.

**DEVELOPER.**—I see by the Journal, that a quick developer is wanted. I believe that the developer is one of the most important requisites of picture making.

I send you one, and also a print from a negative made with it. My aim has been to cheapen every thing I use, and at the same time to get good results.

I am using twenty-five grains of silver to the ounce for my paper.

The print sent was made with twenty-five grains. The paper had A. S. B. brand; you will see that the albumen is not affected in the least.

No. 1.—Water, 1 quart; sulphate of iron, 4 ozs; nitrate of potash,  $\frac{1}{2}$  oz.

Dissolve and add pure cider vinegar, 12 ozs., and 1 oz. sulphuric acid.

No. 2.—Water, 1 quart; white of two eggs; and four drams ammonia conc. Shake up thoroughly and mix with No. 1.

Give about half the time you generally do in the camera; you can push a negative as far as you want without fogging, and it comes out promptly.

In using it for ambrotypes, I add a few grains of acetate of soda to four ounces of the solution, which takes out the free acid and removes the tendency to metallic luster.

It should be made about twenty-four hours before using it; then filter through cotton six or eight ounces at a time.

Circleville, O., Sept. 6, 1866.

#### The Throttle Valve.

Romancers are fond of contrasting the power of the locomotive with the apparently inadequate means of managing and governing that power. It is popularly supposed that a child can start and stop a locomotive. Possibly it may be so; but it is not the belief of those who have occupied the driver's position. Apart from the immense responsibility of the engineer of a train, a responsibility greater and more exacting than that of the conductor, there is a large amount of hard labor to be performed. Even the starting of a train is a labor. It requires something more than the "weight of a child's finger," as we have heard it expressed, to pull the throttle of a locomotive. It requires the exertion of considerable muscular power; and it seems as though the throttle valve might be balanced, so that it would not demand such a strain upon the wrist and the biceps muscle, to open the passage to the steam chests. The subject is worthy of attention, although it may appear trifling. It is no easy job to run one or two hundred miles every day, on a route where the stations are but a few minutes apart, as every engineer of a train knows.

THE expenses of the London and North Western Railroad are 67 cents per mile, those of the Great Western, 70 cents. There are 150,000 men employed upon the railroads of the United Kingdom.

#### MISCELLANEOUS SUMMARY.

A GREAT fire is reported from Corsica, where the magnificent forest of Vizzabona caught fire a week before the last advices, and had been burning ever since. The vast forest, consisting chiefly of pine trees, celebrated for their immense yield of rosin, is now one vast sea of fire. Millions of valuable trees are destroyed, and as yet the efforts of the neighboring population have been ineffectual to arrest the progress of the flames. The damage is estimated at several millions of francs.

M. AUDIGER, a French chemist, has invented or discovered a new mode of embalming, which dispenses with all the repulsive details of the ordinary system. It consists in pouring down the throat of the corpse two glasses of a liquid, whose composition is still a secret. The operation lasts but twenty minutes, and in two or three months the corpse becomes as stone. Experiments have been made with this new method at Marseilles, Algiers, and in the public hospitals, with complete success.

At the recent meeting of the British Association, a paper was read upon the introduction of a new gunpowder for heavy ordnance, in which nitrate of barytes is substituted for saltpeter in composition, the consequence being that the powder, when ignited, consumes more slowly, and the gases are developed less rapidly, while the same effect is produced upon the projectile as regards its ultimate velocity.

THE small crabs found on our Northern Atlantic shores, which are so largely used for bait for the blackfish and bass, are allied to the blue upland crabs of the tropical regions. They are said by some to be a delicious morsel. They seldom reach over one-and-a-half inches in length, and are known by the fishermen as "fiddlers."

At present the copper mines of Arizona are attracting abroad more attention than the deposits of more precious metals. At Williams' Fork on the Colorado river, many valuable copper leads are located and a great deal of work has been done.

THE oil of the menhaden fish, which is caught in immense quantities on the coast of Rhode Island and the southern shores of Massachusetts, is coming largely into use as a substitute for the dark whale oils for carriers' use.

MATRICES for punches originally cut by William Caslon, in 1725, are now in daily use, as the old-fashioned type has again come into fashion.

THE stock and gold reports by the Atlantic cable to London, are first sold to subscribers, and only published in the papers two or three days after.

THE inventor of the needle gun has constructed a new rifle, a fac-simile of the old, but three pounds lighter, and made wholly of iron.

A RAILROAD is about being constructed between Chicago and Port Sarnia, C. W., to connect with the Grand Trunk Railroad at the latter place.

NEARLY five million letters and papers came to the United States from Great Britain in 1865.

A NEW iron truss bridge is to be erected at Pittsfield, Mass., across the Housatonic River.

A VESSEL has recently been constructed in Oregon having but one knot in her whole structure.

#### Submarine Photograph.

A French artist, M. Bazin, has been experimenting lately, with the design of obtaining photographs of sunken vessels, so that in attempting to raise the same positive knowledge can be had of their relative positions. To accomplish this M. Bazin descends to the necessary depth, in a strong sheet-iron box, which he calls his "photographic chamber." Thick glass windows afford every facility for making the necessary preliminary observations, and the picture is taken by the aid of a strong electrical light.

An unpleasant feature of the apparatus, and one which would not recommend it to pleasure seekers, is, that the operator is absolutely hermetically sealed, for no means are provided for supplying air, the chamber being constructed of a proper size to contain the quantity required during the ten or twelve minutes occupied in obtaining a negative.