the issue of National Bank currency through the year has superseded the circulation of State Banks, converted into National Banks or wound up altoget her,so that it is sa feto assume that the volume of paper money of all kinds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 cirlation.—*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 incommoding 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, ½ 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 tho 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 curriers' use.

Matrices for punches originally cut by William Caslon, in 1725, are now in daily use, as the old-faced 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 Britian 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.

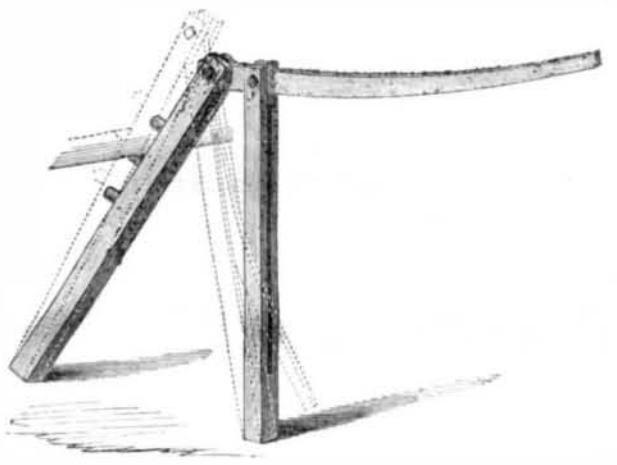
New Material for the Production of Gas.

A Mr. McKenzie, of Glasgow, Scotland, as we learn by Rylands' *Iron Trade Report*, has been experimenting by mixing the coal dust (bituminous) at the mines with crude petroleum, as a basis for the manufacture of illuminating gas. The result of his experiments is said to be very encouraging. The idea is that in the distilling of petroleum alone, a large quantity of the vapor is re-condensed into oil; but by combining the coal with it this waste is prevented, and a coke is left as a residuum which is superior to that from coal alone.

All this may be true, but as the same process has been fairly tested in this country without success, we take the liberty to doubt the professed result. What advantage there can be in the presence of the "coal gum," or siftings, for the production of gas, beyond that afforded by the oil alone, we cannot discover. If, as is stated, a portion of the vapor from oil in the process of distillation is re-converted into oil, "on coming in contact with a cool surface," the remedy is plainly a low distillation. As the oil alone is considered, in the article from which we derive these statements, as the gas producing material, the coal is no better than any other substance to retard the condensation of the gas to an oleaginous liquid.

DUNN'S IMPROVED WAGON JACK.

A lifting jack that is light, portable, and self-retaining, when the weight is imposed upon it, is a desideratum. Most, if not all, of those in general use, must be secured by a pin or otherwise, when the axle of the carriage is raised, but the jack shown in the engraving is in this respect self-operating.



The two uprights are pivoted to the lever, and when the lever is depressed the position assumed is that shown by the dotted lines, the lever shutting into the mortise or channel of the main standard, and the weight of the axle and carriage holding the jack in position. Pins placed at varying distances receive the axle and support the weight. The operation of the implement can be easily comprehended by the aid of the engraving.

Patented July 24, 1866, by Albert Dunn, Plainfield, N. J. For territorial and manufacturers' rights, address Albert Dunn & Co., as above.

[From our own Correspondent.]

FOREIGN SCIENTIFIC NEWS.

The scientific societies of London have now all closed their sittings for the season, after the performance of no inconsiderable amount of valuable work. The recent discovery in Egypt of another stone, with an inscription in three different languages and styles of writing, including Egyptian hieroglyphics, has proved a great boon to philologists. It consists of a vote of thanks from the Priests of Memphis to one of the Ptolemies, in which respect it resembles the Rosetta stone in the British Museum—the stone which first threw light upon the inscriptions upon the monuments of ancient Egypt. On the newly-discovered stone the inscription is longer, and proves that Eastern scholars have been right in the interpretations they have fixed upon many unknown characters, in the absence of direct evidence. Such is the advance in this branch of knowledge that, in past numbers of *Good Words*, *Chambers's Journal*, and other periodicals, may be found translations of fairy tales written in the time of the Pharaohs.

M. De Waldeck, an old gentleman more than 100 years of age, who served under the first Napoleon, has recently returned from Mexico and Peru, where, for a long time, he employed a staff of Indians in excavating some of the remains of the ruined cities of Central America. He has brought back and exhibited at the Ethnological Society many exquisitely-executed drawings and paintings of the grotesque pieces of sculpture dug up under his supervision. Some of the screll work of the sculptures is very Grecian in its style, and the head of the elephant is frequently reproduced. Mr. Mackie, one of the members of the Ethnological Society, is strongly of opinion that some of the characters cut upon these remains are of Assyrian origin, but is little supported in his views by his colleagues.

All the numerous telegraphic cables between England and the continent of Europe are constantly so full of work, that the experience thus gained created great fears that the Atlantic cable, when laid, would be choked with messages, and thus be a slower method of communication than by post. For this reason there is little or no complaint in England about the charges of the Atlantic Telegraph Company, since "high charges" are synonymous with "great speed." Again, the Company for twelve years has had to fight with great disappointments and difficulties, and sunk nearly £2,000,000 of capital, with interest, in the undertaking. As the iceberg season off Newfoundland begins in February next, and lasts till August, during the whole of which time the icebergs yearly ground on the banks off the coast, the public can scarcely complain that the shareholders try to reimburse themselves before the time of greatest danger to the cable begins. The "certainty" of the apparatus used for transmitting messages by the cable is now a matter of public interest. Mr. Varley, considering the delicate nature of the receiving instrument, produces wonderfully sharp and unmistakable signals; still they have not the certainty of the Morse telegraph, which prints its messages; or of the needle telegraph, where the ear assists the eye in the work of reading. The little ray of light, like a bright vertical tongue of fire, sways to and fro upon the ivory scale of the galvanometer, and from its vibrations the messages are read, yet it is very desirable to test the certainty of the apparatus by sending through it a large number of figures and proper names, so that no aid in reading may be afforded by the context, and the reliability of the method of signaling be fairly tested.

On reference to the map of Great Britain, your readers will notice that at the extreme west of England is a magnificent harbor, Milford Haven, opening to the Atlantic as if to welcome visitors from America. Yet its shores are deserted, the great tide of traffic passes outside the mouth of the harbor, and bears northward to Liverpool, to encounter all the dangers of channel navigation, and to add to the number of black spots upon the wreck charts. The natural advantages of Milford Haven have never been economized, because the counties in its neigborhood are poor, without power to develop its resources, and, till lately, there has been little railway accommodation in the district. Within the past five years, two new lines have crept down to its shores, and the direct railway from Milford Haven to Manchester is in progress. The country in the neighborhood of the harbor is rich in anthracite coal, and the steam coal from the great Aberdare carboniferous basin is within easy distance by rail. At present the only signs of life at the Haven are a Government dockyard, and the town of Milford, which is nothing more than a miserable village, with a large percentage of uninhabited houses. The late First Lord of the Admiralty, the Duke of Somerset, declared that the great want of Milford Haven was dock accommodations, which private enterprise is now taking some steps to provide. Some of the Panama line of steamships have been sent by their owners to coal in the harbor, which, from its natural advantages, will probably, in the course of years, prove a great boon to all engaged in trade between England and America.

In my last, it was mentioned that a great body of archæologists, headed by the Marquis Camden, K. G., the Bishop of Oxford, and other gentlemen, had just invaded London to examine its ancient ruins and antiquities. They visited Windsor Castle, where Queen Victoria threw open to inspection every part of the building of interest, including some subterranean passages leading from the interior of the fortress, through the chalk rock, to the bottom of a shaft 35 feet deep, opening in the park, outside the outermost walls of the royal residence. The date of construction of these passages is not known. The archæologists also explored the Tower of London, under the guidance of Mr. G. T. Clark, the trustee and manager of the Dowlais Iron Works. Mr. Clark proved a most efficient cicerone, and in the course of his remarks narrated an unpublished anecdote of the late Duke of Wellington. At the time that His Grace occupied the position of High Constable of the Tower, he kept the public records in a room above the powder vaults. A literary gentleman, on making this discovery, hastened to the Duke, and asked him, "Whether he did not think it a very dangerous thing to keep the records on the top of the powder magazine?" The listener, who regarded the question purely from a military point of view, seemed startled at the suggestion, and replied, "Oh, I never thought of that before." He then mused for a minute, and brightening up he told the querist—"Well, perhaps it is not so dangerous after all, for I really don't think they will hurt the powder!" Mr. Clark piloted his party all over the ancient building, and at last, in the chapel in the White Tower—the chapel in which William the Conqueror and his rapscallions once knelt at their devotions, such as they were—the archæological students listened to perhaps the most instructive and eloquent discourse ever delivered within its walls. He told how Lady Jane Grey, Sir Walter Raleigh, and many others, had knelt before the rude altar in that chapel, and afterward dared to suffer and to die for the sake of opinions which they believed to be true. On the Tower Green, just outside the door, the noblest blood in Englnnd had been shed, and beneath a neighboring staircase had been dug up the bones of the two murdered princes. The whole atmosphere of the place seemed heavy with crime. Mr. Clark concluded with a few remarks about the Tower as a royal residence of the Plantagenets, who having lived out their lives of virtues and crimes, were carried forth to Westminster Abbey, where now they lie upon their altar tombs, with their weapons by their sides and their hands uplifted to heaven, peacefully awaiting the final resurrection.

W. H. H.

London, Tuesday, August 28, 1866

The Bremen Rose-Wein.

A correspondent to the *Nation* gives an estimate of the value of the famous Bremen rose-wein, which, in the year 1624, cost $165 per cask, and is now two hundred and forty-two years old. Calculating the original outlay at ten per cent compound interest, he states that in 1865 the value of each cask was $231,883,905,000, or nearly ninety times the present debt of the United States, while each bottle was worth $161,039,499, very nearly the sum realized from duties on imports in the United States last year. Each glass was worth $20,000,000, and each drop $20,000. We should think that this wine had been kept almost too long, and the owners had better "realize" soon, unless they want to lose on it.

A NEW system of small coinage, invented by Mr. Hall, of Buffalo, is now under consideration by the Government, with prospect of being adopted for future coins. The plan consists in having upon the center of the one-cent pieces a raised star, the nucleus of which is represented by a hole through the coin, the two-cent coins are to have two perforated stars, the three-cent coins, three.

IN Turkey, the income of the sovereign absorbs ten and eight-tenths per cent of the entire revenue. In England six-tenths per cent are applied for supporting royalty.