Zincography.

Mr. Mantel, director of the stereotype foundry of Dupont's printing house, describes as follows the process of converting a lithographic or copper plate print into a typographic block. The composition to be reproduced is drawn with a crayon or pen upon a lithographic stone, which undergoes all the preparation necessary for a proof upon transfer paper. It is then transferred to a plate of properly planed zinc, which has been washed with a solution of soda or potassa and dried with a rag. The transfer is made just as if it were a question of an impression upon stone. Care is taken to see that the fine lines of the drawing are all reproduced, and, if they are satisfactory, gum water, alone or with the addition of a decoction of nutgalls, is passed over the surface of the zinc. The gum combines with the zinc, and renders it proof against the contact of fatty matters.

After the plate has remained under gum for a little while, it is washed and then inked with thick ink by means of a lithographic roller, just as would be done for pulling a proof from stone. Then, by means of a cotton dabber, resin in impalpable powder is dusted over the entire surface—although finely powdered bitumen may likewise be used This resinous dust adheres to the oily parts, solidifies them, lodges in all the interstices formed where the inking has been slight, and forms a protecting envelope against the penetration of the acid. Care is taken to remove all the superfluous resin.

The edges and bottom of the plate are now covered with lac varnish or a solution of bitumen, after which it is immersed in a bath of water containing five per cent of nitric acid. After remaining in this for twenty minutes, it is taken out and gently rubbed with a piece of soft charcoal—an operation which, by removing the first layer of ink, allows the beginning of the conversion of the drawing into a typographic plate to be seen.

This first biting in is usually very slight. If it has proceeded regularly, a second inking is given before immersing the plate in the bath again for another twenty minutes. Upon being taken out the second time the ink is removed as before, and the plate is examined to see whether the acid has done its duty. Then a third inking is given, and the plate is immersed again for from twenty to twenty-five minutes.

At every biting in, the strength of the bath is increased two or three degrees by the acetometer. It is rarely the case that a fourth biting in is necessary. The trough containing the bath is of oak lined with either gutta percha or sheet lead. It is fixed upon a pivot that allows it to be given a continuous rocking motion while the plate is immersed. This agitation is indispensable in order that the acidulated water shall constantly flow over the plate and carry away the salts of zinc that are formed.

The transfer of the drawing from stone to the zinc plate is affected in a lithographic press. Only line drawings are treated by this process.

The zinc plates are prepared by specialists. Moreover, if it be desired to write, draw, or make a transfer upon a zinc plate, it is essential that the latter shall undergo various preparations, such as polishing, scouring, etc. If these operations have been properly performed there will be obtained good typographic plates that it will be only necessary to mount upon wood after the whites have been routed out. Finally, the blisters are removed with a graver, all the inequalities are straightened out, and all the small defects observed are remedied. As for typographic plates derived from an engraving on steel or copper, instead of making a drawing upon stone, the engraving is transferred thereto, and from this is pulled a proof upon India paper, which is transferred to the zinc plate.—*Chronique Industrielle.*

American Shipping.

The Maritime Exchange of New York city recently met to take action on the report of a special committee appointed to suggest a plan for the revival of the merchant marine. The committee was in favor of Congress enacting a law, based on the French bounty act, by which all steam and sailing vessels built in the United States and in the merchant service should be entitled to a bounty of 30 cents per ton for every 1,000 miles sailed. It also suggested that the bounty continue in force for ten years, and that at the end of that time the amount be reduced ten per cent each year. The wording of the suggestion is a trifle ambiguous. The Exchange, having had its purpose strengthened by favorable communications from Philadelphia, Boston, and San Francisco, and from the Commissioner of Navigation, passed a resolution instructing the committee to draw up a bill to be introduced into the next Congress.

At the present time the shipping business is greatly depressed in all parts of the world. In this country many vessels are idle, tied up to the docks, no cargoes to carry. In England hundreds of steamships are laid up, the ship building industry is greatly reduced, and thousands of workmen thrown out of employ. An additional act of Congress that would bring business for our present fleet would not be a bad project.

PHOTOGRAPHIC NOTES.

Graphic Method of Determining the Speed of Shutters.—Prof. L. H. Laudy, of the Columbia College School of Mines, in this city, recently exhibited before the Society of Amateur Photographers a simple apparatus for showing the speed of shutters. It consisted of nothing more than a common tuning fork, which can be purchased for five dollars, having fastened at one end, by glue or cement, a fine delicate style or hair. Upon the outside surface of the shutter was secured a narrow strip of glass, mica, or other transparent, smooth material, by means of four or five drops of melted paraffine. The exposed surface of the glass was smeared with lampblack, obtained by holding the glass over a candle or smoking lamp before adhering it to the shutter.

The lens, with the shutter set, is next placed in front of the tuning fork in proximity to the delicate style on the end, so that the same gently scrapes against the glass strip. With a common violin bow, vibration is imparted rapidly to the tuning fork, and immediately the shutter is made to fall, carrying along with it the glass strip. Taking the glass strip off of the shutter afterward, and examining it by transmitted light, a fine wavy transparent line is seen, the length of each wave increasing as the speed of the shutter was accelerated.

Knowing that the fork makes a certain number of vibrations per second, it is easy to count the different waves on the glass, and thereby determine accurately the time it took the shutter to fall.

When it was desired to maintain a constant vibration in the fork, a battery was provided which, by means of a make and break current, operated a magnet alternately. By careful experiment it was proved that the friction of the delicate style on the glass surface did not in any way affect the vibration of the fork. An ordinary gravity shutter was found to fall in about one-twelfth of a second.

Prof. Laudy stated that Mr. Muybridge, experimenting for the University of Pennsylvania, had succeeded in making a shutter which would operate in the one five-hundredth part of a second. He believed this was the fastest speed yet attained.

The advantage of the tuning fork method over the ordinary chronograph for recording the speed of shutters was its cheapness.

Specimen strips of glass made by operating the shutters of different speeds before the audience were immediately thrown upon the screen by the optical lantern, showing very plainly the remarkable simplicity and advantage of this graphic method. Some of the shutters, with two or three elastics attached, went off with a report as loud as a pistol.

Toning Lantern Slides.–The following useful method for imparting rich blue-purple tones to lantern slides was recently given by Mr. Ayres before the London and Provincial Photographic Association in a report in the *British Journal of Photography.*

He used bichloride of platinum, and could obtain a blue tone, and reduce any shadows which might be too heavy. Three baths were made, as follows:

No. 1.

Water	10 ounces.
Bichloride of platinum	2 grains.

No. 2.

Water	10 ounces.
Chloride of gold	2 grains.

No. 3.

No. 1	1 ounce.
No. 2	1 ounce.

It will be seen that No. 3 is a mixture in equal parts of No. 1 and No. 2. When the shadows of the slide looked too dense and heavy, he put it into No. 1; if, on removing, it then looked too cold in tone, he put it in No. 2 to warm it up. If he doubted whether it wanted warming up, he put it in No. 3. By means of the three baths he had the transparency under complete control, and had no difficulty in turning out good slides. He stated that the plan would do for prints on gelatine as well as on collodion.

With iron development and slow gelatine plates, the tone obtained after fixing is usually a chocolate brown; after well washing, the plate is treated as above stated, when the blue tone is produced.

Bachrach's Method of Developing in Two Solutions.—For the past eighteen months the following plan has been in successful use:

No. 1.

Boiling water	16 ounces.
Crystallized sulphite soda	3 ounces.
Schering's recrystallized pyrogallic acid	1 ounce.
Sulphate of soda	¼ ounce.
To the above add:	
Salicylic acid	5 grains.
Dissolved in	
Alcohol	1 drachm.
Glycerine	¼ ounce.

This solution will keep for months, and may be held in an ordinary covered dipping bath similar to that formerly used to hold the silver bath.

No. 2.

Crystallized carbonate of soda	½ ounce.
Crystallized sulphite of soda	1 ounce.
Water	12 ounces.

The plate is dipped in No. 1 for from a half to one minute, then removed and put into a developing tray containing sufficient of No. 2 to cover the plate. Should the plate be overexposed, a suitable restrainer is added to No. 2.

The plan of procedure is to develop the plates which are thought to be underexposed first, and finish with those fully timed, as it is found No. 2 acquires a little pyro from the plates.

The development of large batches of plates by this plan is not only rapid and economical, but also remarkably uniform in density and color.

With the whole amount of the No. 1 solution, two persons (one to dip in No. 1 and the other to develop) have frequently developed twenty-five 8x10 plates in half an hour, with results much more even and satisfactory than with the usual method.

The function of the addition of the sulphate of soda to No. 1 is to prevent the solution from attacking or softening the gelatine film, especially when plates are used prepared with a soft gelatine.

The Preservation of the Obelisk.

The New York Park Commissioners are taking the preliminary steps toward the protection of the obelisk in Central Park. They have decided to employ a paraffine process suggested by Prof. Doremus, and known as the Caffall patent process. The shaft is first gone over very carefully, and every loose particle removed from its surface. This is the most tedious part of the whole undertaking, but is considered absolutely necessary for a thorough treatment. The erection of the scaffolding required some little time, as it had to be built entirely independent of the monolith.

After this scraping, the surface of the stone, when thoroughly dry, is heated to a temperature slightly exceeding the melting point of the waterproofing mixture, about 140° F., by means of a series of small charcoal furnaces suspended from the scaffolding. The waterproofing mixture consists of paraffine, creosote, and turpentine, and is prepared as follows: One part by weight of creosote is mixed with five parts of turpentine, and the mixture boiled until clear. Twenty-five parts of paraffine are then added, and the whole brought almost to ebullition. The hot liquid is applied to the heated surface of the stone, and is absorbed to a depth of one or two inches, depending upon the depth to which the stone is heated. After treatment, the surface is hard and waterproof, the only visible effect being a darkening of the color. This, however, will improve the appearance of the monolith, as the syenite was originally darker than at present. The work will probably be completed some time during November, and is expected to cost about $550.

We publish on another page an interesting letter from a correspondent in Nashville, Tenn., who gives the results of practical experience in preserving stone structures.

The Explosion of Dynamite.

The chronoscope of Captain Noble showed that explosion is transmitted through trains of dynamite at the rate of 20,000 to 24,000 feet per second. At this rate the explosion of a cartridge a foot long must only occupy the 24,000th part of a second. A ton of dynamite cartridges of the usual size, about ⅞ inch in diameter, laid end to end in a line, would stretch a mile, and the whole train could be exploded in the one-fourth part of a second by firing a cartridge at either of the ends. If fired in the middle of the line, the explosion would be transmitted both ways, and would occupy only the eighth part of a second. The facility with which dynamite can be fired in trains offers great advantage in many engineering operations, such as where it is required to blow down an arch or a wall. It is enough to lay a train of cartridges along the crown of the arch, or along the bottom of the wall, and explode one cartridge in the usual way with a detonator. The whole train goes off instantly. The enormous velocity with which dynamite explodes explains the great violence of its action, and the tremendous local rupturing effects of even small quantities of it exploded in the open, and without being inclosed in a case of any kind. The detonation of a cartridge in the 24,000th part of a second must produce an enormous instantaneous pressure on the spot on which it explodes. For such a sudden explosion the pressure of the atmosphere itself is sufficient tamping.

Wind on Lake Erie.

During the prevalence of a strong east wind, the waters of Lake Erie were recently lowered two feet at the eastern end of the lake, and the work of loading boats in the Blackwell Canal had to be suspended. At Toledo the wind blew such a gale at the same time, but from the west, that the Maumee River dropped two feet below the accustomed level, and a steam barge could not leave port on account of low water. The two currents met in the lake off Port Stanley, Ont., and produced a noticeable elevation of the waters. Such an occurrence has never been known before on the lakes.