

Correspondence.

Molasses in Mortar.

To the Editor of the Scientific American:

In see in your issue of February 27 a letter from Big Stone Gap, Va., in regard to sugar in mortar. In repairing and modernizing a residence, my plasterer had occasion to tear off a plastered ceiling that had molasses spilled above and run through on plastering. The rest of ceiling came off easily, and he had to take off the laths to remove the part that had been soaked with the molasses. Hence I am sure that his discovery is a very useful one, and will prove a success when it comes into common use.

W. T. HANES.

Eminence, Ky., February 29, 1892.

Visibility of the Proposed Odd Fellows' Temple.

To the Editor of the Scientific American:

In a recent copy of your excellent journal, I find the statement—presumably indorsed by you—that the proposed Odd Fellows' Temple, in Chicago, 556 ft. high, will be visible for 60 miles.

Is not this statement rather deceiving? First, because inland, where there might be hills or other elevations, the atmosphere is always too hazy (especially near Chicago) to see that distance. Secondly, out on the lake, supposing the atmosphere to be perfectly clear, an observer at 32 miles distance would have lost sight of the building below the horizon, while to see it at 60 miles distance one must stand at an elevation of 2,166 ft. above the level of Chicago.

FLORENCE B. LINING.

Philadelphia, March 6, 1892.

[Our correspondent is correct, and the statement we copied from is wrong.—ED.]

Occupation for Old People.

To the Editor of the Scientific American:

Perhaps a suggestion from an irrigating district on this subject would be in order.

It is my opinion that about eight out of ten of the old men, and ladies too, would take kindly to a small garden, could they have a wind mill and pump for irrigating.

I would suggest that they begin, not for a livelihood, but for the purpose of enlivening others. Grow all they can, and sell everything at the very highest price possible.

This they can conscientiously do, when the object ahead is pleasure for others.

Let the proceeds be divided: First, for the happiness of others; second, for enlarging or perfecting operations; third, for the "rainy day."

Of course, each particular person could decide as to the per cent to be set aside for each particular purpose.

Could the above suggestion be the means of giving one day's happiness to one person, I will, indeed, be amply repaid, and would take pleasure in giving any hints or help to any one taking an interest in such a project.

D. D. SMITH.

Gila Bend, Arizona, Feb. 29, 1892.

Webb's Wonderful Test Plates.

To the Editor of the Scientific American:

In an article by President Morton, in your issue of this date, page 133, on "Magnitude of Molecules and Light Waves," a reference is made to Webb's "test plates," which called up recollections of "old times" in my mind that may be of interest to some of your readers.

The reference is to a "test plate" on which the Lord's Prayer, containing 227 letters, is written in the $\frac{1}{16}$ of a square inch, or at the rate of eight Bibles to the square inch, the Bible containing 3,566,480 letters.

Now I have had in my possession since, I think, about 1868 one of these "test plates," on which the Lord's Prayer is written in the $\frac{1}{16} \times \frac{1}{16}$ of an inch, or the $\frac{1}{256}$ of a square inch, and at the rate of 74,115,500 letters—being more than twenty Bibles—in the square inch.

Webb has, however, produced them up to twenty-seven Bibles to the square inch.

If not taking up too much of your valuable space, I would like further to say that I feel especial interest in these "test plates," as they were, I believe, written by Webb with a machine invented by a Mr. Peters and exhibited by him in the "great exhibition" in London, 1851, where it caused intense excitement in the scientific world. It was purchased by the Microscopical Society of London, now Royal Microscopical Society, for, I think, £500.

I was elected a Fellow of that society in 1866, and at that time there was only one of the Fellows practically acquainted with its mechanism—Mr. Virtue.

He took a fancy to me, and offered to teach me how to write with it. No less than three appointments were made for that purpose, all of which, unfortunately, fell through; and shortly afterward he died.

A few years afterward I left London, and do not know how matters now stand.

The marvel is accomplished by writing in a rectangle about 6×9 in a large clear hand. This is reduced by a series of levers, and reproduced at an infinitesimal point on the glass cover.

Could any society, college, university, or the exhibition commissioners obtain the loan of this machine for the World's Fair? It would prove an immense attraction to thousands of "scientific Americans," and I do not doubt that for such a purpose, and under proper guarantees and guardianship, the Royal Microscopical Society would be willing to further the interests of science by loaning it.

STEPHEN HELM.

Roselle, N. J., Feb. 27, 1892.

The Papyrotint.

BY J. HUSBAND.

This process has been named papyrotint, being a modification of Captain Abney's improved method of photo-lithography named papyrotype.

It is specially adapted for the reproduction of subjects in half tone, such as architectural drawings in monochrome, or subjects from nature, and it is inexpensive. Its advantages over other methods of half tone photo-lithography are that a transfer can be taken in greasy ink for transfer to stone or zinc, direct from any negative, however large, without the aid of a medium, the grain or reticulation being obtained simply by a chemical change. The transfer paper being in direct contact with the negative, the resulting prints are sharper than those by processes where interposed media are used, while the same negative will answer either for a silver print, platinotype, or a transfer for zinc or stone.

The method of manipulation is as follows: Any good surfaced paper is floated on a bath composed of—

Gelatine (Nelson's flake).....	1½ oz.
Chloride of sodium (common salt).....	½ "
Water.....	13½ "
Chrome alum.....	6 gr.

Great care should be taken that the solution is not overheated and that the paper is coated without bubbles.

The paper is coated twice with the above solution, dried and floated in a 25 per cent solution of bicarbonate of potash. It is then dried in a temperature of 60° F. The film will take about ten hours to dry, and in this state will keep for years. The paper is very hygroscopic, and must be kept in a dry place. When required for use it should be sensitized by floating, or immersing in a bath of—

Bichromate of potash.....	1 oz.
Chloride of sodium.....	½ "
Ferridcyanide of potassium.....	100 gr.
Water.....	30 oz.

This need not be done in the dark room, as the solution is not sensitive to light.

The paper after sensitizing is dried in a temperature of 70°, and in a dark room. When dry it is exposed under any half-tone negative in the ordinary printing frame. It is preferable to print in sunlight, and for negatives of medium density an exposure of three minutes is required, but the exposure will vary according to the density of the negative. The correct time of exposure can best be judged by looking at the print in the frame. When the image appears on the transfer paper of a dark fawn color, on a yellow ground, the transfer is sufficiently printed. It is put into a bath of cold water for about ten minutes until the soluble gelatine has taken up its full quantity of water, then taken out, placed on a flat piece of stone, glass or zinc plate, and the surface dried with blotting paper.

The action of the light has been to render the parts to which it has penetrated through the negative partly insoluble and at the same time granulated; a hard transfer ink is now used, composed of—

White virgin wax.....	½ oz.
Stearine.....	½ "
Common resin.....	½ "

These are melted together in a crucible over a small gas jet and to them are added 4 oz. of chalk printing ink, and the mixture reduced to the consistency of cream with spirits of turpentine. A soft sponge is saturated with this mixture and rubbed gently over the exposed paper (in this stage the nature of the grain can be best seen). An ordinary letter-press roller, made of "Acme" composition, charged with a little ink from the inking slab, is then passed over the transfer, causing the ink to adhere firmly to the parts affected by the light, and removing it from the parts unacted upon. It will be found that with practice, rolling slowly and carefully as a letter-press printer would his form, the ink will be removed by the roller according to the action that has taken place by light, leaving the shadows fully charged with ink, and the high lights almost clear, the result being a grained transfer in greasy ink. The transfer is next put into a weak bath of tannin and bichromate of potash for a few minutes, and when taken out the surplus solution should be carefully dried off between clean sheets of blotting paper.

The transfer is hung up to dry, and when thoroughly dry, the whole of the still sensitive surface should be exposed to light for about two minutes. A weak solution of oxalic acid or phosphoric acid for zinc should be

used for damping the transfer (about 1 in 100), and this should be applied to the back of the transfer with a soft sponge. After it has been damped about four times it should be carefully put between clean sheets of blotting paper and the surplus moisture removed. A cold polished stone is then set in the press, and after everything is ready the transfer is placed on the stone and pulled through twice, the stone or scraper is then reversed, and again the transfer is twice pulled through. A moderate pressure and a hard backing sheet should be used, care being taken not to increase the pressure after the first pull through. The transfer is taken from the stone without damping, when it will be found that the ink has left the paper clean. Gum up the stone in the usual way, but if possible let the transfer remain a few hours before rolling up. Do not wash it out with turpentine, and use middle varnish to thin down the ink.

It should have been mentioned that varying degrees of fineness of grain can be given to the transfer by adding a little more ferridcyanide of potassium in the sensitizing solution, and drying the transfer paper in a higher temperature, or by heating the paper a little before exposure, or by adding a little hot water to the cold water bath, after the transfer has been fully exposed; the higher the temperature of the water, the coarser the grain will be. The finer grain is best suited to negatives from nature when a considerable amount of detail has to be shown.

The coarse grain is best for subjects in monochrome, or large negatives from nature or architecture, etc., where the detail is not so small. Even from the finer grain several hundred copies can be pulled, as many as 1,200 having been pulled from a single transfer, and this one would have produced a great many more if required.—*Jour. Photo. Soc. of India.*

Government or Municipal Ownership.

I have made a special effort, as evidence of our impartiality, to get together at this meeting some of those who believe in the abolition of private enterprise and in the surrender of all the ideas that make us crave for a home of our own and the accumulation of a few dollars for a rainy day. If we are wrong in the opinion that self-help is the best help, and that ten well-to-do citizens count more for the community than twenty superfluous officeholders, it is time we knew it. Some people want the government to run the railroads and some want it to buy up the telegraphs and telephones. Others want the municipalities to own street railways, gas works, and electric light plants. In Boston there is, I am told, a demand that the city shall collect more taxes and put into public coal yards. I am reminded of my reading, as a boy at school, when I learned that the foredoomed population of a great city once set up a howl for free bread and free tickets to the circus. Now, let me say right here that public franchises are a public trust. In return for them we are to do something or agree to something that the community wants. In my humble judgment, it has yet to be proved that such a way of introducing improvements and benefits is wrong or foolish. I am a busy man, and have been earning a livelihood all my life, but I have had time enough to observe that the whole vast industrial development that has added so enormously to the comfort and happiness of life has come from the investment, under public franchises, of private capital, skill, and enterprise. The public has thus been made the partner in all the great works of the age, and has thus gained infinitely more than it could have secured if it had raised an equal amount of money by taxation, and had placed the proceeds in the hands of a vast body of officeholders for the same purposes.—*Chas. L. Huntley, Nat. Elec. Light Convention.*

Explosive Power of Benzine.

An explosion of benzine vapor at the Baldwin Locomotive Works, February 16, killed two men and seriously injured a third. The dome of a boiler had been removed, and just before the noon hour the men applied a considerable quantity of benzine to bolt and rivet heads inside the boiler to soften the rust and scale. On resuming work one of the men got inside the boiler, and a boiler maker's lamp was lowered to him. A considerable quantity of benzine vapor had probably accumulated in the boiler and mixed with air, for an explosion took place, and the body of the man inside the boiler was fired like a projectile straight upward through the dome opening and lodged in the roof trusses overhead. The overhead electric crane had to be run underneath in order to reach him. Notwithstanding severe burns and other injuries, he lived after the accident for several hours. The workman who lowered the lamp into the boiler, and who was standing directly over the dome opening, is supposed to have been struck by the body of the man inside. He was also blown upward, struck one of the roof braces, and fell on a pile of iron plates. He died in a few minutes. The third workman was standing on top of the boiler between the cab and the dome. He was thrown to the ground and badly burned and bruised.