

Correspondence.

To the Editor of the Scientific American:

In your issue of July 4, in the article on "Florida Phosphate Deposits," Prof. Wyatt speaks in a very discouraging manner regarding transportation facilities in the phosphate district.

Knowing that you do not wish to convey an erroneous impression, I would call your attention to the fact that our company was incorporated by special act of the Florida Legislature on May 13, 1891; we have three surveying parties already at work, and it is intended to have our railroad in operation in one year. It will be the only standard gauge steel railway in South Florida traversing the phosphate districts and enabling the various phosphate companies to deliver directly from the cars to sea-going vessels at deep water. This will not only make traveling a comfort, but correct the present evils spoken of.

Prof. Wyatt, undoubtedly, was not cognizant of our enterprise at the time of writing his article.

As the Arcadia, Gulf Coast and Lakeland Railroad will do so much to overcome these impediments and difficulties Prof. Wyatt mentions, I trust that you will, in the interest of further enlightenment to your readers, give publicity to the facts here stated.

ANTHONY PETERS, Pres.

Boston, Mass., July 8, 1891.

Edison's Cosmical Telephone.

To the Editor of the Scientific American:

Your correspondent of last week, in his criticism of Mr. Edison's cosmical telephone, displays either a lamentable ignorance of the principles of physics or a total misconception of Mr. Edison's plans. His chief objection was that there was no interplanetary medium capable of transmitting sound waves. Now from the very construction of Mr. Edison's apparatus it is evident that the waves that he operates with are not sound waves, but electro-magnetic waves.

The solar tempests give rise to these electric waves, which cross space with the velocity of light, and cause magnetic disturbances on the earth. The object of the cosmical telephone is to change these electric waves into sound waves and render them audible.

Regarding the supposition that the sounds heard by Mr. Edison in the experiment with the long distance telephone were of seismic origin, I should say that Mr. Whitmore had confounded the electric with the acoustic telephone. No earthquake jars acting on a telephone line would be audible in the receiver unless they were accompanied with some magnetic disturbance.

It is hardly reasonable to suppose that Mr. Edison is ignorant of the elementary laws of physics, especially in the branches of acoustics and electricity. Whether or not his experiment is successful, his theory is perfectly sound.

R. W. WOOD, JR.

Jamaica Plain, July 3, 1891.

The Cosmical Telephone.

To the Editor of the Scientific American:

Referring to the communication of Mr. E. B. Whitmore, in your issue of July 4, on Edison's cosmical telephone, it would seem that the writer has misconstrued the meaning of the article to which reference is made.

Is it to be supposed that Mr. Edison expects anything like the direct transmission of sound waves from the sun by any material medium such as air? It is pretty thoroughly determined that there is a relation of some sort between the disturbances on the sun's surface and the electric and magnetic terrestrial disturbances. It has been shown that the existence of such disturbances, as evidenced by sun spots, is practically coincident with the electrical storms on the earth. It being assumed that the velocity of light and electricity are practically the same, there would seem to be no reason why Mr. Edison should not hear, in the cosmical telephone, sounds caused by electric and magnetic induction due to the activity of the sun. If a person should speak in a telephone in Chicago, he would not expect to wait hours for the sound to reach New York through the medium of the air when it could be transmitted by the inductive action of the telephone in a period almost infinitely short.

New York, July 4, 1891.

GEO. M. HOPKINS.

Edison's Cosmical Telephone.

To the Editor of the Scientific American:

In your issue of July 4 a correspondent comments upon Edison's "Cosmical Telephone," and, judging from his remarks, is evidently misinformed as to the theory upon which the experiments are based.

He supposes that Mr. Edison proposes to deal with sounds transmitted directly from the sun, which, as he correctly reasons, would indeed be impossible.

What the great inventor does take advantage of in his attempt to reproduce the supposed noises at the sun is the fact that that heavenly body produces, or is supposed to produce, magnetic disturbances in the iron mountain which he has surrounded by a number of turns of wire. The action then is the same in principle as the ordinary Bell telephone.

These magnetic variations and disturbances set up a varying electric current in the wire surrounding the iron mountain, and passing through the helix of a telephone receiver, cause its diaphragm to vibrate corresponding to the undulations of the current, thus producing sound.

Thus it will be seen that the sounds heard at the cosmical telephone receiver are purely local, depending for their existence on the magnetic disturbance of the iron mountain, and are totally independent of any material medium existing between the sun and earth. It may be that the magnetic effects produced by the sun on the iron mountain are unaccompanied by sounds at the sun itself; nevertheless any magnetic disturbance at the mountain, no matter what its origin, will create sounds in the telephone receiver.

In conclusion, then, we may reason that the sounds heard at the cosmical receiver in no way depend upon material medium existing between sun and earth, or that the existence of sounds heard at the cosmical receiver need necessarily imply that corresponding sounds, or even any sound at all, exists or is created at or by the sun during its influence on the iron mountain.

FRANK McMILLAN.

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PHOTOGRAPHIC NOTES.

Photographs on Silk.—Those chemists who are practical photographers can well utilize silk for presenting their customers with souvenirs—sachets, almanacs, etc.—at Christmas time. Sensitized silk can now be obtained commercially, but there is not much difficulty in preparing it. China silk we have found to be the best, and there is a great variety of ground tints to choose from. The silk must be well washed to free it from dressing, and then immersed in the following solution:

Common salt.....	4 grammes.
Arrowroot.....	4 "
Acetic acid.....	15 cc.
Distilled water.....	100 cc.

The arrowroot is dissolved in the water by the aid of a gentle heat, and then the other ingredients added, and finally—

Tannin.....	4 grammes,
dissolved in—	
Distilled water.....	100 cc.

are also added, and the mixture filtered. The silk is allowed to lie in this salting bath for three minutes, hung up to dry, and afterward sensitized on a silver bath as follows:

Nitrate of silver.....	3 grammes.
Distilled water.....	25 cc.
Nitric acid.....	½ drop.

The silk is floated on this for one minute, then hung up till surface dry, and finally pinned out on a board till thoroughly dry. It is printed in the usual way, and washed and toned as usual, though we have found the mixed acetate and sulphocyanide bath give the best tones.

A New Silvering Bath.—M. Dagreve, in *Les Annales Photographiques*, suggests the following method of silvering old plated or copper articles, which may be useful to any chemist who has some old fixing baths and some worn electroplate: The articles to be plated are well washed with soap and water and then immersed in an old fixing bath which has been used for fixing plates. In a very short time a deposit of silver forms, and then the article should be taken out, rinsed, polished with a soft leather, and again immersed till the deposited silver is thick enough. When an extra thick coating is desired, a piece of wire is affixed to the object, and at the other end of the wire a sheet of zinc, allowing 1 square centimeter of zinc to every square decimeter of the article to be plated. It is not advisable to use old print fixing baths for this purpose, as the silver has a peculiar yellow tinge; but chloride of silver which has not been exposed to light may be used.

Iodides in the Developer.—Herr Lainer, of the Vienna Institute of Photography, has been examining the action of iodine and iodides in hydroquinone, eikonogen, and pyro developers, and has found that their action is precisely the opposite to that of bromides; the latter, as is well known, tending to the increase of contrast, whereas iodine and iodides tend to produce reduction of contrast, and, if used in excess, to very flat negatives. A 1 per cent solution of iodine in equal parts of alcohol and water is recommended, and the addition of 2 or 3 drops of such tincture to every ounce of developer has a striking effect.

Borax in Developing Solutions.—The addition of borax to developing solutions has often been noticed to retard development, yet borax is distinctly alkaline. The apparent anomaly has been explained by M. Aug. Lambert, who calls attention to the well known fact that borax reacts with the polyhydric alcohols, liberating boric acid. The same thing takes place with pyrogallol and hydroquinone. Thus, borax added in small quantities to pyrogallol converts it into a true acid which reddens litmus. It is the same with tannin and pyrocatechin, so that with these substances the addition of an alkaline borate is equivalent to the addition

of an acid, the salt in this case causing retardation. But this reaction is not produced with the isomers of pyrocatechin, *i. e.*, hydroquinone and resorcin. Neither is it produced with the ether-developing agents now in use. Here borax does not give rise to any acid, and acts merely by its alkalinity.

A New Platinum and Gold Toning Bath.—A well known amateur, the Rev. H. B. Hare, has suggested the use of the ordinary gold and borax toning bath and then a platinum bath for ordinary albumen prints. The prints are just wetted, then immersed in the ordinary borax bath A:

(A)

Chloride of gold.....	2 grains.
Borax.....	90 "
Water.....	12 ounces.

The prints are allowed to remain in this till they assume a warm brown color, are then removed and placed for a minute in clean water, and then placed in the platinum bath B:

(B)

Chloroplatinite of potassium.....	24 grains.
Citric acid.....	60 "
Salt.....	96 "
Water.....	12 ounces.

When they quickly assume a fine purple black. Reducing Over-dense Negatives.—Belizki recommends the following formula. It must be mixed in the order given:

Water.....	200 parts.
Potassium ferric oxalate.....	10 "
Sodium sulphite (neutral).....	8 "
Oxalic acid.....	3 "
Sodium hyposulphite.....	50 "

It will retain its working strength if kept in the dark, and may be used over and over, so long as it has a green color.

Photographic Perspective.—Very few photographs of landscapes are correct in perspective. Mr. A. Mallock has been discussing in *Nature* the optical factors which determine this, and in the course of his article he says that any photograph taken with a lens of less than about a foot focal length must exaggerate all the distances or make objects in the picture look smaller than they should. The only remedy for this, in his opinion, is to enlarge the picture until the right distance to view it from becomes also the convenient distance. Even if this be done, however, there is still a tendency to view the picture too far off; for few lenses, except those for portraits, embrace an angle so small as to be taken in at a single glance, and people are naturally inclined to stand far enough from a picture to see the whole of it at once. Still, a proper amount of enlargement offers the best means of making a photograph give a true idea of the scene which it represents; and this is especially true of the small pictures taken by so-called "detective" cameras, having lenses varying from four to six inches in focal length; and it is for this end, and not, in general, to enable more detail to be seen, that the enlarging process is most useful.—*Chemist and Druggist.*

Direct Positives.—At the Royal Society's soiree recently, Professor Emerson Reynolds exhibited a series of new derivatives and had a paper on the subject at the Chemical Society, on May 7, where the photographs were also exhibited. It is tetrathiocarbamidammonium bromide (H₂N₂CS₄), H₂NBr, which is the most effective agent, the presence of only one-hundredth of a grain per ounce of "eikonogen" developer causing the negative image that first appears to change into a rich colored positive. The series of six small photographs show the process of reversal interrupted at different stages, so that the transition from a negative to a positive can be traced. At the Chemical Society, Mr. Groves drew attention to the curious fact that the silver deposit, which, in the early stage of development, apparently behaves like that forming an ordinary negative image, in the later stage becomes soluble. It will be a splendid thing, says the *Chemist and Druggist*, for lantern photography if this process is perfected; but as yet it can only be considered to be in the experimental stage.

Design for a Very Fast Steamer.

Messrs. James and George Thomson, Glasgow, have modeled a new steamer guaranteed to steam at the rate of 23½ knots an hour, which will enable the vessel to cross the Atlantic within five days. The vessel is to be about 630 ft. long by 70 ft. beam. The lines are very fine. The new vessel will have twin screws 22 ft. or 23 ft. in diameter, well supported. There are four funnels, and about 200 ft. of the length of the ship is left for the boilers and bunkers. The engines are to be triple compound, with four cylinders working four cranks. They will probably indicate 33,000 indicated horse power. Accommodation is provided for 700 first and 300 second class passengers and about 400 emigrants, and all the arrangements worked out in the plans are far ahead, as far as regards luxury and comfort, of anything yet produced. The plating of the ship is carried up to the promenade deck, which runs from end to end, and a width of about 20 ft. on each side is left for walking. On the promenade deck are twelve machine guns, and in other respects the vessel is made suitable for an armed cruiser.