Correspondence.

The Gold Dollar.

To the Editor of the SCIENTIFIC AMERICAN:

I inclose the following clipping from the SCIENTIFIC AMERICAN of May 19, 1849:

"THE GOLD DOLLAR.

"This beautiful coin has at last been issued. It is somewhat smaller than a five cent piece, and is very beautiful. It is our opinion that it is the most beautiful coin in the world."

Need I ask if you have found reason to change your opinion of the gold dollar, as expressed forty-seven years ago?

I found the clipping yesterday, and think it may interest you at this strange hour of our country's history. M. POWEL.

Newport, Rhode Island.

[We see no reason for changing our opinion in regard to the beauty and worth of the little coin.—ED.]

Nothing New Under the Sun.

To the Editor of the SCIENTIFIC AMERICAN:

Having just been looking over a bound volume of the SCIENTIFIC AMERICAN for 1846 and 1847, volume two, of your magazine, I beg to call your attention to two points therein, which are very interesting in view of, first, the discovery of the pneumatic tire, and second, the X rays of Roentgen. For the first, refer to bottom of first column, page 262, volume 2, issue of May 8, 1847. It shows that the exact principle of the pneumatic tire was in use at that early day.

Second, seventh article of third column, page 290, volume 2, issue of June 5, 1847, states that a Belgian savant has discovered that electric light makes human bodies so diaphanous as to make the arteries, nerves, etc., visible, and their action studiable.

Although Crookes tubes were not mentioned, it is possible that some similar device was used, in the then undeveloped state of electrical science. It would be interesting to know whom the Belgian savant was.

Standard, Florida. A. C. FIRTH.

[We reprint the items to which our correspondent refers.—ED.]

PNEUMATIC TIRES.

A number of cabs with newly invented wheels have just been put on the pave here. Their novelty consists in the entire absence of springs. A hollow tube of India rubber about a foot in diameter, inflated with air, encircles each wheel in the manner of a tire, and with the addition of this simple but novel appendage the vehicle glides noiselessly along, affording the greatest possible amount of cab comfort to the passenger.—SCIENTIFIC AMERICAN, May 8, 1847.

THE X RAY IN 1847.

A Belgian savant says he has just discovered that electric light directed on the human body makes it so diaphanous as to enable the arteries, veins and nerves to be seen at work, and their action to be studied.—SCIENTIFIC AMERICAN, June 5, 1847.

Absorption Photography and X Rays.

To the Editors of the SCIENTIFIC AMERICAN:

The scientific interest connected with the Roentgen or X rays has brought out, through a large number of investigators, a great variety of phenomena bearing directly or remotely upon the original methods and results. While studying the work of others on the X rays proper, the recollection of an accident which the writer had in some photographic work led to a series of experiments along a line which may or may not be connected directly with the Roentgen rays. The experiments were begun about the middle of March and are not yet finished. So far as the writer is aware, no work has been reported in just this line of investigation. The object of the experiments was to ascertain, if possible, if photographic negatives could be gotten similar to X ray negatives by the action of energy previously stored in certain bodies. The results of the experiments which are to be given seem to point very strongly to an affirmative answer.

Experiment No. 1.—From a newspaper was taken a cut of a pair of eyeglasses, and from a glazed paper was taken another cut. These were exposed for about an hour to sunlight and were then removed to a dark room, and after cooling were placed over a common sensitive glass plate and very carefully and thoroughly wrapped in white cloth and paper and then placed in a tight box and allowed to stand in a dark room for about one day. At the end of this time the plate was slowly developed and found to reveal the picture clearly, the one on the unglazed paper being slightly more distinct. A similar experiment was tried, using lamp instead of sunlight, and gave similar but not so strong results.

Experiment No. 2.—At the same time that No. 1 was being carried on, a figure cut from the inside leaf of a book which had been in the dark for the most part for a year or more was, without exposure to light, placed over a sensitive plate. No results were secured in this case.

Experiment No. 3.—Over a pine board was placed a black woolen cloth, and to this were fastened fragments of zinc, copper, graphite, silver, glass, rubber, and wood. This was exposed to sunlight for an hour, and after cooling was placed over the sensitive plate, carefully wrapped in cloth, and placed in a tight wooden box and kept in the dark room for about one day. Upon developing, only the wood and rubber showed much.

Experiment No. 4.—On a small piece of pine board were fastened the following articles: muscovite, copper coin, mica, an iron key, and a piece of glass. The whole was then exposed to sunlight for an hour, taken to the dark room, and when cool all the articles were removed and the wood placed over a sensitive plate and thoroughly protected by wrapping in cloth and placing in a tight box in the dark room. After one day the plate was developed, and all the articles were revealed on the negative by light figures, but the iron key and the copper coin seemed best to shut out the light. Similar experiments were successfully performed by exposure to powerful incandescent gaslight and to incandescent electric light, though the results were not so intense as by sunlight.

Experiment No. 5.—A key was placed over one side of a common Kodak roll film and a piece of brass placed on the opposite side. These were placed in a dark box and connected with the two poles of a battery for several hours. When developed, a very faint shadow appeared.

Experiment No. 6.—A piece of mica and an iron key were heated in an alcohol flame till the edges just began to be red hot. They were then allowed to cool and were placed over a sensitive plate in a perfectly dark box in a dark room for twenty-four hours. When developed, there was revealed the shadow outline of each.

Experiment No. 7.—A current of electricity from a dynamo, sufficient to produce a small spark, was passed through an iron key. The key was allowed to cool and was then placed over a sensitive plate, in a tight box, for twenty-four hours or more. When developed, there was seen the shadow outline of the key.

Experiment No. 8.—A fresh fern stem was placed over a sensitive plate, and after being so kept for twenty-four hours, the plate was developed and there was revealed the outline of the whole stem, with a much darker central portion corresponding to the circulatory system, all of which was very clearly brought out.

In some of the experiments which have been mentioned there was contact with the plate, while in others equally good results were obtained without contact. Considerable skill and a rather long time were required in the developing process. The results described are but a few of those obtained along this general line of study. It will appear from these experiments that in no case did the light pass through the object to be photographed; and further, that light is not necessary.

All of these experiments, but especially those in which the objects were heated or exposed to an electric current, and subsequently cooled in the dark, indicate, first, that the photographic action is due simply to energy stored in the body to be photographed and afterward slowly given off, there being a great difference in the power of absorption and radiation in various substances; second, that this energy may be from other sources than luminous rays, if these only reach a maximum rapidity of vibration; and that when this rate of vibration is reached a molecular change in the silver salts of the photographic plate is started, with greater or less intensity, depending upon the character and source of the energy, and completed in the developing process.

From certain researches now being made, the writer would venture the suggestion that possibly certain phenomena connected with the Roentgen photography proper may be in part explained by these general statements. He hopes to present, at some future time, a series of experiments of such a nature as to confirm this statement. E. J. BABCOCK.

Chemical Laboratory, State University of North Dakota, July 21, 1896.

[We have examined the photographs made in the manner described. They clearly show that the objects represented must have stored considerable energy to have produced the results secured by Professor Babcock.—EDS.]

The Holtzer Projectile.

To the Editor of the SCIENTIFIC AMERICAN:

In the SCIENTIFIC AMERICAN of July 4 you give an interesting résumé of tests of the Harvey-Carnegie plates destined for Russia, in which you say:

"The plate was attacked in rapid succession by five 6 inch and three 4 inch Holtzer armor piercing shell fired at high velocities."

And farther on you add: "While its ability to keep out and completely pulverize a 6 inch Holtzer shell when fired at a striking velocity of 2,149 foot seconds, showed what splendid ballistic resistance it possessed."

We are thoroughly convinced of the excellence of the Harvey-Carnegie plates, but we must make some reservations in regard to the production of the shells used. In the first place, we have never made 4 inch projectiles for the United States. Further, if we delivered any 6 inch projectiles, they were made more than four years ago, and at that time the superiority of the Harvey plates had not been established.

If these plates have been improved since then, we have introduced also improvements of our manufacture and we can now make projectiles capable of piercing (without being broken) Harvey plates, provided that the increased velocity is given to these projectiles required by the greater resistance of the new plates.

We would be greatly obliged if you would make your readers acquainted with the real condition of affairs by inserting a correction in an early number of your paper. JACOB HOLTZER & COMPANY.

Acieries d'Unieux Loire, France.

[We published the statements in regard to tests as furnished to us by the authorities in March.—ED.]

The Healthfulness of Sewage Farm Products.

Concerning the question of the healthfulness of crops grown on sewage disposal farms, the Hospital speaks as follows:

"This is a question which cannot be settled with a precision approaching to the mathematical, either in physiological laboratories or by means of statistics gathered from the experience of the community at large. But there is an old scientific method, now a good deal despised, whereby men of intelligence can arrive at trustworthy conclusions; and that is the method of careful observation, personal experiment, and an appeal to the court of common sense. By the use of this method many facts like the following have been accumulated by generations of experimentalists, and they settle the controversy in a practical sense. For example, if a cow is fed on turnips, within twenty-four hours her milk will taste of turnips, and if butter be churned from the cream, the butter will taste too. The intensity of the turnip flavor is the measure of the quantity of turnips taken. In like manner, if pigs be fed on horseflesh, as they often are, their bacon will taste of the horseflesh; if they be fed on fish, the bacon has a fishy taste. The same is true of hens and their eggs. Feed hens on decaying animal matter, which they will eat greedily, and both their eggs and flesh will be most unpleasant and unwholesome eating. In the case of ducks the facts are much more striking. Ducks are very unclean feeders. Give them abundance of garbage, and they will refuse corn and similar food. Their flesh is then most pungent to the taste, and in many people is so potently poisoning as to produce diarrhœa. Animals fed on sewage farms under certain conditions are liable to have their flesh and secretions changed in character by the sewage-produced herbs and grasses upon which they feed. If the sewage on a given farm be so managed that no more of it be put into the soil than any given crop can adequately deal with, then the crop will be sweet and natural, and the cattle or other animals fed on it will be sweet and natural too. But if the soil be gorged to repletion with sewage, then the crops will be surcharged with sewage elements, and unfit for food, and the meat and milk of animals fed on such crops will be like the crops, and very unpleasant to the taste as well as dangerous to health. It is in the last resort all a question of the intelligence and conscience of the managers of sewage farms."

Ground Moles in Sugar Beet Cultivation.

When farmers take upon themselves the destruction of ground moles, they little realize that they are working against their own interest. The animals live entirely upon insects and can devour in twenty-four hours several times their own weight, leaving all vegetable matter alone. If the surface of the soil shows indication of their presence, it may be declared in advance that they have found on their passage through the substrata the requisite food for their maintenance, which in the case of beet cultivation generally means white worms. These would have subsequently come to the surface and partially destroyed a crop of beets. That rows of roots have suffered from ground moles is insignificant in comparison with acres of beets that would have been victims of insect ravages. It frequently happens that the tiller prides himself upon the success of his beet crop, while his neighbor, suggests the Sugar Beet (journal), has been less fortunate when the real cause may have been that in the latter case the ground moles have been destroyed and in the former they were left to themselves.

The Largest Ship in the World.

According to Prometheus the largest ship in the world is building at the Vulcan shipyard in Bredon, near Stettin, Germany, for the Hamburg-American line. The same builders constructed the first large express steamer built in Germany, the Augusta-Victoria, of the same line. The new monster steamer has a length of 625 feet on the waterline, and is therefore considerably larger than the Campania, which is 600 feet in length between perpendiculars. The engines will have 27,000 horse power and a speed of 22 knots is expected. The engines and boilers will also be furnished by the Vulcan shipyards. Construction has been commenced already.