[ANTHONY'S BULLETIN.]

Preparing Silver Paper.

We have for some time past felt the need of a good silver printing process suitable for intermittent work, when silver printing may only be required at intervals of weeks or months. Albumenized paper, if kept in stock, is likely to be found spotted, when wanted, from the extreme damp of the rainy season; and, on the other hand, if the weather is at all dry, the prints curl up and are difficult to keep in good order unmounted. The varieties of gelatino chloride paper (P.O.P.) are very difficult to work in this steamy climate, the paper does not keep in good order, is expensive and not always obtainable when required.

We have latterly been using plain salted paper containing a good quantity of gelatine in the salting solution, but even with this it is very difficult to obtain bright prints except from very strong negatives, and the image was always more or less sunk and flat. Increasing the gelatine and adding a little chrome alum to harden it gave much better results, but it was difficult to prepare the paper with a good, even coating without a proper machine for the purpose.

I was very glad, therefore, to see in the British Journal of Photography for August 9 a paper, read by Mr. G. H. Moss before the South London Photographic Society, on "The Preparation of Plain Salted Silver Paper," and more so, on trying his formula, to find that it answered perfectly and practically solved the problem, so far as our work is concerned, and proved itself to be an effective, simple and inexpensive silver printing process, with many special advantages of its own. It is more suited for thick paper than for thin, and the prints show a rich tone, with plenty of brilliancy and detail in the shadow.

The main peculiarity of Mr. Moss' process is, that no colloid material, such as gelatine, albumen or starch, enters into the preparation of the sensitive paper beyond that already contained in the sizing, the advantage of this being that the unstable compounds, which gelatine and albumen form with silver salts, are absent or only present in very small proportion.

The difficulty was to obtain vigor and keep the image on the surface without the colloid, and after many experiments he adopted the following formula for the salting solution :

Sodium chloride in crystals, not table salt	150 grains.
Ammonium chloride	100 "
Potassium bichromate	4 "
Water to	20 ounces.

The bichromate gives vigor to the image, and may be increased for very thin negatives and lessened for hard and dense ones.

Whatman's drawing paper, or Rives' paper, is soaked in this solution for three to five minutes, and hung up to dry. If not required at once, the salted paper can be kept, and is said to improve by keeping, no doubt by the action of the bichromate on the sizing of the paper.

The salted paper is sensitized by floating for about two minutes on the following bath :

Silver nitrate	400 grains.
Citric acid	150 "
Water	10 ounces.

After sensitizing, the surface will be a light primrose, and care must be taken to avoid air bubbles.

The paper when dry is very sensitive, and should be printed rather deeper than desired. The toning can be done as for P.O.P., with a bath of about half the strength. We have found the borax bath in ordinary use answer well. The prints must be well washed after toning and then fixed in hypo solution, 1 to 10 of water, for about ten minutes for thin papers, or up to twenty minutes for rough and heavy papers. After fixing, the prints should be well washed for two hours in constant changes of water.

The paper keeps well after sensitizing, and this is a further great advantage. The absence of colloid material or of any sulphur compounds, as in albumenized prints, tends largely to the permanence of the prints. With reasonable care in fixing and washing, and by using fairly pure papers for salting, the prints may be expected to resist outside influences for a considerable period, not so long, perhaps, as platinum or carbon prints, but certainly much longer than silver prints prepared with albumen or gelatine.

The process seems really a useful one, well worth attention, especially of residents in warm climates.

COL. J. WATERHOUSE.

Gold Beneath the Lava.

The great lava flow covers a section of country in Idaho four hundred miles in length by forty to sixty miles in width. It lies in the southeastern part of the State, on and along the course of the Snake River, and mostly on the north side of that stream.

After flooding the great plain lying to the southward, the lava turned and flowed backward to the north. There it flowed into the mouths of the valleys lying between the foot hills, filling all the streams that flowed out toward the south. The streams thus checked and dammed presently found passages beneath the porous lava, and now flow under it from thirty to fifty miles, to reappear as large springs or to burst forth in cascades and tumble down the walls of basalt that border Snake River. On the line of the back flow, up toward the northern foot hills, lies the most ragged and forbidding portion of the great lava plain.

These lava flows covered rivers, creeks, canyons, valleys, and even basin regions filled with low hills. Many of the streams, gulches, flats, and basins in the country surrounding the lava-covered section on all sides have been wonderfully rich in gold, wherefore it is reasonable to suppose that many of those covered by the lava are also rich in the same way.

The Snake or Shoshone forms the great center of the Idaho river system. It has a course of 850 miles within the State, and, with its branches, drains nearly the whole country. The Clearwater, the Salmon, the Weiser, the Fayette, the Boise, the Lembi, the Owyhee, and other rivers, tributary to the Snake, were wonderfully rich in gold. The Yankee fork of the Salmon and many other creeks were exceedingly rich in the yellow metal. Rich placers were found in the streams that formed the Boise River in 1862; in the year following in the tributaries of the Owyhee and many other places. The valleys of the Weiser and Fayette, constituting what was known as the "Boise Basin," was one of the richest placer regions ever found.

What are called basins in Idaho are not bowl-shaped depressions, as many suppose, but are sections of low country surrounded by large mountains. Within the basins are many hills and creeks. The Florence Basin was astonishingly rich and many others were little behind it as producers. Prior to 1868 these basins and other surface diggings in little flats and on gulches produced $45,000,000. Up to 1873, by which time most of the famous placers had been worked, the yield from the surface diggings amounted to $75,000,000. Then began the rich discoveries in quartz, but placer mining is still continued and occasionally rich finds are made.

From what has been said of the rich deposits of gold in the basins, valleys, gulches, flats and streams of Idaho, it is reasonable to suppose that under the great lava flow covering an immense area—not less than 20,000 square miles—in the heart of the auriferous region, must lie many exceedingly rich deposits of gold.

The gold placers of both California and Idaho are countless ages older than the lava flows. In California the channels of the ancient rivers beneath the lava are much richer than those of the modern rivers and placers. This is because the channels of the ancient rivers had served as bedrock sluices for untold ages before the disturbing lava flows began. The present rivers of California received the greater part of their gold by their cutting across and carrying away great sections of the rich channels of the ancient rivers. —Dan De Quille, in the Engineering and Mining Jour.

Our Defenseless Condition.

Senator Cullom, speaking recently on the Monroe doctrine, said :

In this connection I desire to call the attention of the Senate to a conversation which I see quoted here as having taken place in China between Mr. Curtis, a very able correspondent, and Mr. Li Hung Chang, the Chinese Viceroy. Speaking to Mr. Curtis about this government, Li Hung Chang said :

"Your government and your people are very unwise if they are not thinking of such things."

Referring to our naked condition of preparation for war.

"Particularly since the events that have occurred in China during the last year. The Japanese are a very aggressive people. They are a warlike people. They like to fight, and they are proud and arrogant. They do not care for the United States, except as a market for their silk and tea, and if your government ever interferes with their plans, either at home or in the Sandwich Islands, you will find that their friendship is only a pretense they keep up to encourage your trade. If President Cleveland had responded to my appeal for intervention during the late war, Japan would have sent her army and her ships from our harbors over to your country and would have taken possession of your Pacific States."

Mr. Curtis says he tried to explain the situation to Li Hung Chang, but "the Viceroy sneered in a contemptuous manner," and said :

"Japan has an army of over 200,000 soldiers and the best guns in the world."

I suppose he realized that from China's experience in the late war.

"She has a larger and better fleet of war ships than the United States. She has ten times as many torpedo boats as your government, and her sailors know how to use them, while yours do not. You have only five ships on the Pacific coast, with a coast line of 3,000 miles to protect, and several populous and wealthy cities with no defenses whatever. You have no forts at San Francisco that could keep out the weakest gunboat in the navy of Japan, and a single ship of the Japanese navy could destroy every city on Puget Sound without the slightest difficulty in a week."

Correspondence.

The Duryea Motor.

To the Editor of the SCIENTIFIC AMERICAN :

In your issue of December 14 you state that of the four gasoline wagons in the Chicago contest, "The Duryea, the Benz-Mueller, and the De la Vergne wagons used modified Benz motors." This is an error, in that the Macy wagon should have been reported as using a Benz motor, instead of the Duryea.

The Duryea wagon uses a motor of new and light design, and, like the wagon, thoroughly American. The Benz motor is a single cylinder, with a heavy fly wheel, and is supplied with gas from a carbureter.

The Duryea motor is a double cylinder, with balanced pistons, light fly wheel, and no carbureter at all. It was designed especially for the purpose, after several years of experimenting with wagon motors, and is not in any sense a copy of or an improvement on any foreign motor. CHAS. E. DURYEA.

Peoria, Ill., December 19, 1895.

Weather Bureau Reports on Envelopes.

We received a newspaper clipping from a Buffalo (N. Y.) correspondent advocating the use of the Post Office for disseminating Weather Bureau intelligence. We referred the matter to the Weather Bureau, and received the following reply :

SCIENTIFIC AMERICAN, New York City :

Sirs : In reply to your communication of the 16th instant, inclosing newspaper clipping and letter from your correspondent at Buffalo, relative to stamping weather forecasts on letters, I have the honor to inform you that the proposition is not to utilize the cancellation stamp, but the "back" stamp. The idea was suggested at the Convention of State Weather Service Directors held in Indianapolis, October 16-17, 1895, by Mr. Frank P. Chaffee, Local Forecast Official, Montgomery, Ala. As the plan was regarded with favor, efforts have been made to give it a practical trial. Should the tests which are now being made in a limited way result satisfactorily, it is possible that the plan may be put into general use. Very respectfully, WILLIS L. MOORE,

Chief of Weather Bureau,

United States Department of Agriculture.

The Bridge of an Ocean Liner.

Let us spend an hour with Captain Randle, of the American liner St. Louis, on the bridge in midocean. He first takes us into the wheel house. It is a room about ten feet long and ten feet wide, with a curved front. A wheel about three feet in diameter is placed in the center of the room, and you are surprised to see that the quartermaster keeps turning it almost constantly. You have always thought that he had simply to keep his eye on the floating compass in the box directly in front of him and hold the ship steady in her course. As you look at the compass you see the ship veering now this way and now that as she rolls and plunges, or as one screw turns faster than the other, and thus pulls the ship around. It is hard to make two independent screws go at exactly the same speed, and so this man at the wheel is busy all the time turning the ship straight. He has to fight the waves and the screws and the winds at the same time, and he is a busy man.

This steering wheel controls the ship by means of a small column of oil in a little tube. By turning the wheel this way or that the oil in the tube is forced up or down, and that opens or closes certain valves in the steam steering gear four hundred feet away, and the rudder is turned as easily as if a child had done it. In most steamships the steam steering gear is controlled by hydraulic power—that is, by water—but the use of a column of oil is an improvement.

As you look about, you see fastened to the cornice, directly in front of the wheel man, a little scale in black with white lines marked off on it. There is a dial on it, and as the ship rolls you see that this is a device to mark the degree of a roll. You may notice that it takes about a second for every degree of a roll. On each side of the room is another long black gage, and the dials point to certain figures, generally between ninety and ninety-five. These dials are little electrical devices, showing exactly how many revolutions the screws are making. The captain, at a glance, knows what is going on in the engine rooms.

Over in the corner of the room is another curious electrical device.* It is a little box with a clock in it. The captain tells you it is the machine that controls the whistle in time of fog. The law requires a long blast of the whistle at such times every two minutes. By pressing in a button on this little clock apparatus, and by setting the clock in a certain manner, the whistle is blown automatically for seven seconds every minute. There can be no error of man in that work. Just as sure as every minute comes around that whistle will blow seven seconds. Under the old way, when a man pulled the whistle cord, there was no exactness in the work. When the fog is over the button is released and the whistle stops.—Harper's Round Table.