Correspondence.

EFFLORESCENCE AND OXIDATION OF SODIUM SULPHITE.

To the Editor of the SCIENTIFIC AMERICAN:

I inclose the different results that were obtained here in the laboratory on the efflorescence and oxidation of sodium sulphite.

These results were obtained by taking ordinary commercial sulphite and grinding it to a coarse powder, and then spreading it in a layer of a quarter of an inch on a glass plate protected from dust.

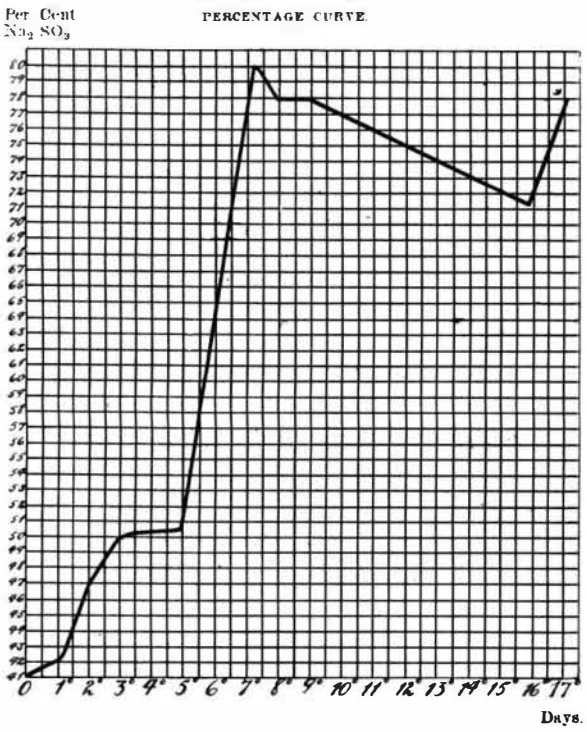
At the end of the first day a sample was taken and weighed, then dissolved in a beaker with some water and titrated with $\frac{N}{10}$ iodine which had been standardized before. A burette of 50 c. c. capacity was filled with the standard iodine solution. Everything now being ready, the iodine was run in on the sulphite, starch indicator being added beforehand, when the blue color of starch iodide made its appearance, this being shown by the last drop of iodine producing a deep blue coloration, the stop cock was shut off and the number of c. c used read off.

The calculations were very simple, being based on this reaction:

$$\underbrace{Na_2SO_3, 7H_2O}_{20)\overline{251{\cdot}6}\ \overline{12{\cdot}58}} + \underbrace{I_2}_{20)\overline{254}\ \overline{12{\cdot}7}} = 2NaI + H_2SO_4 + 6H_2O$$

= grm. in 1000 c. c. of standard solution.

The results from the analysis are all combined in the form of a table or curve seen in the illustration.



EFFLORESCENCE AND OXIDATION OF SODIUM SULPHITE.

When the sulphite was first exposed its per cent was 41. The first day of exposure the sulphite lost water enough to reach 43 per cent real sulphite, next day it jumped to 48 per cent, and so on until it reached 80 per cent. It was evidently at this point that all the water had been lost by efflorescence. Then oxidation started and oxygen was taken up from the air to lower the percentage of real sulphite down to 71½ per cent, but here, again, the loss of some more water was sufficient to overcome the loss by oxidation and run the percentage up to 78, but this would only be a temporary gain, as oxidation would begin to lower it.

RANDOLPH BOLLING.

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A Solar Magnetic Engine.

To the Editor of the SCIENTIFIC AMERICAN:

I find your paper here on the table, and in looking over it is revived the memory of 1845, when at Philadelphia I first commenced to read it as a system of education in science and invention, in which I had engaged when only eighteen years of age—1840. Born at Philadelphia in 1821, sound and healthy yet, due to my discoveries in medical chemistry. A few days since I was examining several of your papers of 1850, containing a description of my solar magnetic engine, which was a continuous rotary motion derived from the alternating action of horseshoe magnets. I then gave it to the world, through your paper, The Franklin Institute Journal, and London Mechanic's Magazine. Now I ride in the cars here, propelled by its power. I had it running in Philadelphia in 1850, and now the world knows not whence it came. Such is the fate of science and invention when not accompanied by the grasping greed of gain. My prediction that it would become an engine of power to the world has been verified, and that is my satisfaction. I was far ahead of the electric age in 1850 when I made it. I hope some of my old friends of that time among you are still living. WILLIAM WHEELER HUBBELL.

House of Representatives, U. S., Washington, D. C.

The Tomb of Gengis Khan.

M. Bonin, vice-resident of France in Indo-China, has communicated to the Academie des Inscriptions et Belles-Lettres a very interesting note upon the historic monument designated by Mongolian tradition as the tomb of Gengis Khan, and which has often been described by travelers, although no one has up to the present been able to enter it and inspect it in detail. The following is what Prjevalsky, the Russian explorer, has to say of it:

"Legend teaches us that the mortal remains of Gengis Khan repose in the bosom of Ordos, in the district of Wan, which is situated at 200 versts to the south of Lake Dabasoun-Nor. These remains are inclosed in two coffins, one of silver and the other of wood, placed under a tent of yellow silk. The arms of the monarch are near him, and the other members of the royal family are buried at a distance of ten versts further along. A sheep and a horse are offered every evening to the royal manes, and the next morning the offering has disappeared. At his death, the conqueror predicted that he would come to life again in eight or, at the most, ten centuries. Consequently, it will be necessary to wait but a hundred and fifty or three hundred and fifty years for such resurrection. Then a war will break out between Gengis Khan and the sovereign of China. The former will be the conqueror and will lead the Mongolians from Ordos to Khalka, their own country. It has been impossible for me to ascertain the location of the mortuary temple of which this legend speaks."

This passage in Prjevalsky's book attracted M. Bonin's attention, and he conceived the idea of making some researches with a view to discovering the mysterious tomb.

In the month of July, 1896, says he, in the course of an official mission of which I had charge upon the frontiers of China, finding myself on the bank of the Yellow River, to the north of Ordos, in the center of which, according to the concordant narratives of explorers, the tomb ought to be found, I decided to verify the facts set forth in the tradition.

It requires a march of about a week, to the south of the Yellow River, through the territories of the kings of Djoungar and Wan, to reach the monument, which, in Mongolian, bears the name of Yeke-Etjen-Koro, or "the palace of the great lord," and which stands in the center of the desert surrounded by a village of tents. The tomb, which fronts the southeast, has for subbasement a vast platform of stones, and the posterior half is surrounded by a wooden palisade. This latter incloses the two large tents that cover the emperor's remains, and, to the left, a small tent, and, in the rear, a wooden booth where objects of worship are dispensed. It is entered through a gate provided with a shed in the Chinese style.

The two large felt tents that cover the tomb are exactly like the tents of the present Mongolians, but are of much greater dimensions. They are placed back to back, so that, from the first, one can see what is taking place in the second, and each is surmounted with a gilded bronze ball such as may be seen upon the roofs of the large Thibetan lamaseries. The front tent is used for religious exercises, and a dozen men can easily stand erect in it. In the center there is an altar covered with yellow silk, at the sides high red lacquered tables, and at the back a violet silk velum, ornamented with flowers, that seems to be very ancient and dates back, perhaps, to the time of the Conqueror. A red curtain separates the two tents, and is raised only for prayers and sacrifices. When this is drawn, there is seen upon the floor of the second tent the large, low and wide silver coffin, which contains the emperor's remains. It has the form of a huge chest ornamented with rosework chiseled in the metal. At the back of the tent and over the tomb there is a mirror with an inlaid frame of Chinese workmanship, and from the sides are suspended various objects that are said to have belonged to Gengis, especially his saddle and saber. In reality these are reproductions. The originals have been carefully concealed, on account of the sacrilegious thefts that have been attempted at different times, especially during the last Mussulman revolt.

The worship that is rendered to the memory of Gengis Kahn is purely laical. It is performed by officers who are hereditarily in charge of the tomb, and who receive from the court of Pekin regular titles of mandarin order. The external forms of the worship comprise three sorts of ceremonies: the petty sacrifice, the great sacrifice or sacrifice of the horse, and the great commemorative fete that takes place every year on the twenty-first day of the third moon, the anniversary of Gengis' death. On this day the Mongolians come from every part of the desert to pitch their tents at Yeke-Etjen-Koro and venerate the relics of the emperor, which are brought together and exposed around the tomb.

Miscellaneous Notes and Receipts.

To Thaw Out Water Pipes. — According to the Deutsche Hausbesitzer Zeitung, a simple remedy consists in shoveling away the snow from above the pipes, covering them one-quarter meter high with unslaked lime and pouring on water. In consequence of the heat generated thereby the ground and the pipes are thawed out.

Preserving Stone Monuments.—To retard the disintegrating of stone monuments, such as tombstones, etc., without painting them and covering up the natural color of the stone, it is recommended to dissolve one part blond shellac (as pale as possible) in eight to ten parts pyroxylic spirit, applying it with a rose. The shellac dissolves in pyroxylic spirit like in alcohol.—Leipziger Maler Kalender.

Extermination of Mould in Cellars.—Unslaked lime is best suited for this purpose. Same is blown, in the shape of a fine powder, on the walls of the cellar and into the joints and crevices by means of the bellows or else thrown on with the hand. The walls must be damp; dry walls have to be well moistened previously. The lime slakes with the adhering water and kills all organisms. On the day following the walls are washed off, and, as experience has proved, the cellar will remain free from mould for at least two years.

Production of Ground Glass.—Lainer recommends the following process in the Chemiker Zeitung: Mix 240 c. cm. of commercial hydrofluoric acid of 1·258 specific gravity with 600 grammes of pulverized soda crystals, then dilute with 1,000 c. cm. of water. After standing for some time a sediment is formed and over it a clear solution. The thoroughly cleaned glass pane is provided with a wax edge (prepared by kneading yellow wax with tallow, colophony and asphalt powder) and pre-etched with common hydrofluoric acid (1 : 10) for some minutes to obtain an absolutely clean glass surface. Then wash with water and wipe the plate with a clean, soft sponge until the surface is only very slightly moist. Stir up the paste of the etching acid and pour the mass ½ to 1 cm. high upon the pane. With this mixture a nice normal deadening is obtained after one hour. If the acid is old, having been used often, it may be made to act longer upon the plate of glass. The liquid is poured back into the vat and the glass is rinsed off with water. Then the water is allowed to remain upon the pane until a skin, formed from the surface of the glass, can be removed with the finger or a brush. The strong deadening obtained by this method can be fixed to any desired degree of transparency by etching with hydrofluoric acid.

Hardened and Washable Articles of Plaster of Paris.—For the hardening of gypsum a firm in Heidelberg has taken out a German patent on a process which apparently surpasses all those in existence and furnishes very satisfactory results. Either burnt gypsum is prepared and mixed with the liquid named below or else the finished articles of hot gypsum or of mixtures of gypsum and other bodies are impregnated by painting with the fluid. The same consists of a solution of ammonium triborate in water. For this purpose boracic acid is dissolved in warm water and a certain amount of ammonia is added, whereby a substance readily soluble in water and deviating much in its properties from known compounds results. The saturation of the gypsum or painting of the plaster of Paris articles is carried out in the cold. The objects are subsequently rinsed off and dried. The surface becomes very hard after two days and insoluble in water, while the induration in the interior advances more slowly. By means of the fluid described gypsum floors can be hardened and rendered more durable and impervious to the influence of the weather. Saturating with ammonium borate is said to be especially useful on exterior walls of buildings, barracks, etc.; on the latter, because experiments have proved an antiseptic action of the liquid.

To Test Ivory for Genuineness.—As ivory is extensively employed and costs about twelve marks (three dollars) per kilogramme, it has been attempted to substitute a cheaper substance having the same appearance. Since about twenty years an article has been worked up in this industry, which, in contradistinction to the genuine animal ivory, has its origin in the vegetable kingdom, being derived from the nut of a palm-like shrub called Phytelephas macrocarpa, whose fruit reaches the size of an apple. This fruit has a very white, exceedingly hard kernel, which can be worked like ivory. One hundred of these fruits only costing about four marks (one dollar), their use offers great advantages. Worked on the lathe, this ivory can be passed off as the genuine article, the resemblance being so great that it is sold at the same price. It also can be colored just like genuine ivory. M. Pasquier, of Liege, now gives a practical method in Science en Famille to distinguish the two varieties of ivory. It is the following: Concentrated sulphuric acid applied to vegetable ivory will cause a pink coloring to appear in about ten to twelve minutes, which can be removed by washing with water. Applied on genuine ivory, this acid does not affect it in any manner.—Journal der Goldschmiedekunst.