

To prepare the solution of cuprate of ammonia, a concentrated solution of sal ammoniac is saturated with newly precipitated oxyd of copper; or the method of Peligot may be used, which I recommend to the photographers as very easy to execute. After the solid impurities have completely settled in this solution, perfectly white cotton is dissolved in the same in the proportion of 10 grammes to the litre. A thick liquid is thus obtained which is diluted with some water, so that the cotton is entirely dissolved. This liquid is mixed with a concentrated solution of iodide of potash, so that one litre of the solution contains from 5 to 10 grammes of iodide of potash. The liquid thus obtained (which may be preserved for any length of time) is spread on the glass plates. Upon the correct preparation of the solution of cotton in the cuprate of ammonia the beauty of the picture entirely depends. This solution should be thick, so as to spread slowly on the plate, and when dry the stratum should be perfectly transparent, without a dull appearance. Should the solution be too thin the picture is only superficial, and a stream of water is sufficient to obliterate it.

When the solution of cotton has thus been poured upon the glass plate, it spreads over it quite easily and, as it evaporates slowly, the liquid (by means of the end of a glass tube) can be brought to flow to those spots which, from the beginning, may have remained uncovered. The surplus liquid is made to drop off, and the plate is placed upright against the wall.

There are two different ways to proceed further:—

1 The plate is left to evaporate only for a few minutes; the surplus liquid collects at its lower edge and is removed by means of a piece of tissue (silk) paper, and the plate is now immersed in a newly-prepared bath of nitrate of silver which is diluted with acetic acid and with acetate of silver. The stratum becomes white, the same as with the usual mode of proceeding, by means of the iodide of silver formed in the same, and the plate is now exposed in the camera, and the picture fixed in the usual manner.

2 If the glass be left to dry entirely, the ammonia is expelled by evaporation, and the usual reaction of the iodide of potash on the copper salts takes place, and half-iodide of copper ($Cu^2 I$) is formed in the interior of the stratum of cotton, and iodine itself on its surface. Such a covering of the glass has a red appearance when dry, and if immersed in the nitrate of silver, a superficial picture is formed which is removed by the slightest washing, and besides, on account of the half-iodide of copper, metallic silver is formed below the picture. These difficulties I have removed by immersing the glass plate in pure alcohol, free of water, and saturated with a stream of dry gas of ammonia. The free iodine is transformed into iodide of ammonia and aldehyd is formed. An immersion of a few seconds is sufficient to render the glass white. After taking the glass from this bath, it is moved in the air, in order to remove the surplus ammonia by evaporation, and it is now, while still quite wet, immersed into the nitrate of silver, and the further operation is as usual. By this process very fine and extremely transparent pictures are obtained, and for this reason this process is peculiarly adapted for taking landscapes and buildings.

It is obvious that simple cotton will supersede, in future, the gun cotton or collodion in photographs; the preparation of the latter for this purpose being always attended with some difficulties. The process proposed by me is extremely simple, very economical, and it gives the finest pictures in a very short time, particularly by using the first method.

[The above-described process is the invention of D. Van Monkhaven, and we have translated the description from *Dingler's Polytechnic Journal*. The method of Peligot, mentioned in this article, for preparing the cuprate of ammonia, was published in the *Comptes Rendus*, in December, 1858, and it consists in running liquid ammonia several times through copper turnings inclosed in a vertical vessel. By applying heat the formation of the cuprate of ammonia is considerably facilitated. By adding to the liquid ammonia a few drops of dissolved sal ammoniac, and if, instead of using copper turnings, cement copper is used, the process is still further facilitated, and a solution of cuprate of ammonia is obtained which dissolves the fibers of cotton with great facility. If the solution should not be perfectly clear, it may be filtered over amianthus, as it would per-

forate paper in a few moments. According to Peligot, the liquid cuprate of ammonia dissolves an equal weight of cotton.—Eds.

FOREIGN NEWS AND MARKETS.

A little iron steamer of only 20 tons burden, named the *Helen Coran*, built on the Clyde for a railway company in Bahia, South America, has made the passage across the Atlantic, but not without fearful risk. The captain and crew numbered only five individuals. The little craft was frequently almost buried under the waves, as it encountered several severe storms.

The *London Engineer* says:—"Trade is, on the whole, favorably spoken of at Sheffield. The American orders for steel of late, have been, on the whole, more regular and satisfactory than they were; and it may be safely said that, in all the heavy branches, there is a healthy, steady trade being done by the firms of established name and reputation. From some cause or other, however, difficult to explain, the orders for sheets have rather fallen off, more particularly for pen steel. The arrival of the winter season has at last had a chilling effect on the demand for crinoline steel, so that, for a month or two, the manufacturers will have a little rest until the orders for the coming season arrive; these, the manufacturers predict, will be larger than ever—the *Empress Eugenie* and the press notwithstanding."

An artesian well of 26 inches bore—the largest in the world—has been completed at Birmingham for the supply of a large bath house. The machinery employed to bore this well is similar to that used by the Chinese, and was found very efficient. It consisted of a heavy bar of cast iron, armed at its lower end with a number of cutting chisels, and was suspended by a rope, which received an up-and-down motion from a small steam engine at the top. The torsion of the rope was sufficient to vary the position of the chisels at each stroke. The apparatus of most well-borers consists of a cylindrical chamber secured around the cutting chisels, which, by means of valves, receives and retains the abraded portions of the rock as cut. The new apparatus invented by Mr. Greenly, the engineer of this well, consisted of a long cylinder, nine inches in diameter, with a valve and piston fitted in it like a pump. The cylinder was lowered down whenever the boring was to be cleared, and it was filled full of the debris by the sucker or piston being raised, when the whole was then drawn up.

The directors of the *Great Eastern* have borrowed £40,000, on the security of the vessel, to complete the whole work. It is stated that the company have claims against J. Scott Russell of £60,000 for the work not being done in a proper manner and in the exact time to go to America, according to contract. As a whole, this steamer appears to be a failure in a commercial and engineering sense, if the directors are to be credited.

A new method of inhaling chloroform has been introduced into the hospitals in Paris. It consists in inhaling the chloroform by one nostril only, the other being left to draw in air, so that a mixture of air and chloroform is thus taken into the lungs together. The chloroform is placed in a bottle with a narrow neck, the upper end of which is inserted in the nostril; the mouth must not be opened during the operation. By this process the patient feels no sensation of suffocation, nor is there any congestion of the brain. It is stated to be a safe and very simple plan in comparison with the common mode of chloroform inhalation.

A blacksmith, named James Sharples, of Blackburn, England, has just produced an elaborate steel engraving from an equally elaborate painting by himself. The artist is self-taught, both as a painter and engraver. The subject of the painting is a sturdy smith at the forge, swinging his hammer and making the sparks fly. The production is stated, by distinguished critics, to be a wonderful effort of genius, skill and perseverance. The painting is his own conception, and he labored at it for three years during his spare evening hours; and he then spent five years more during such hours in executing the engraving. Such perseverance deserves the highest praise.

At a late meeting of the Manchester Philosophical Society, Dr. Joule stated that the common method of testing the strength of steam boilers by hydraulic pressure, and by admitting steam into them, was not fair, because such conditions were not similar to those under which a boiler was commonly used. He had adopted a

plan and had employed it for two years, which was free from all objections. It consisted in filling the boiler entirely with water, heating it to 90° Fah., then loading the safety valve up to the point it was to be tested. The gage is constantly observed, and if the pressure occasioned by the expansion of the water increases continuously up to the testing point, it may be safely inferred that the boiler has stood it without strain or rupture. This method of testing the strength of a boiler by the simple expansion of the water, occasioned by heat, is very simple, and can be executed by any person who has a boiler.

The prices of the English metals have somewhat changed since our last issue. Rails continue steady, with some more orders in the market. They are quoted at £5 12s. 6d. at the Welsh ports; wrought iron fishing rail chairs at £7 per ton; cast iron chairs at £4. A large business has lately been done in Glasgow with Scotch pig iron, and an advance of 2s. 6d. per ton has been made, the price being £2 17s. 6d. Spelter, £21 10s. Banca tin, £141 per ton. Straits, £138—a rise of about £3. Tin plates have also risen. On the whole, the British metal market has greatly advanced.

NEW YORK MARKETS.

CANDLES.—Sperm, city, 35c. a 40c. per lb.; sperm, patent, 50c.; wax, paraffine, 50c.; adamantine, city, 18c. a 21c.; stearic, 27 a 28c.

COAL.—Anthracite, \$4.50 a \$5; Liverpool orrel, per chaldron, \$11; cannel, \$12.

COPPER.—Refined ingots, 25½c. per lb.; sheathing, 26c.; yellow metal, 26c.

CORDBAGE.—Manilla, American made, 8½c. per lb.; Rope, Russia hemp, 12c.

COTTON.—Ordinary, 8½c. a 8½c.; good ordinary, 9½c. a 10c.; middling, 11½c. a 11½c.; good middling, 11½c. a 12½c.; middling fair, 11½c. a 12½c.

DOMESTIC GOODS.—Shirtings, brown, 30-inch, per yard, 6c. a 7½c.; shirtings, bleached, 26 a 32-inch, per yard, 6c. a 6c.; shirtings, bleached, 30 a 34-inch, per yard, 7c. a 8½c.; sheetings, brown, 36 a 37-inch, per yard, 5½c. a 8½c.; sheetings, bleached, 56-inch, per yard, 7½c. a 15c.; calicoes, 6c. a 11c.; drillings, bleached, 30-inch, per yard, 8½c. a 10c.; cloths, all wool, \$1.50 a \$2.50; cloths, cotton warp, 85c. a \$1.27; cassimeres, 85c. a \$1.37½; satinets, 30c. a 60c.; flannels, 15c. a 20c.; Canton flannels, brown, 8½c. a 13c.

DYEWOODS.—Barwood, per ton, \$13 a \$30; Camwood, \$150; Fustic, Cuba, \$35 a \$50; Fustic, Tampico, \$22; Fustic, Savanilla, \$19 a \$25; Fustic, Maracaibo, \$18.50 a \$19; Logwood, Liguana, \$3 a 23; Logwood, Tabasco, \$1; Logwood, St. Domingo, \$3 a \$3.50; Logwood, Honduras, \$16 a \$17; Logwood, Jamaica, \$12.50 a \$12; Lima wood, \$35 a \$75; Sapan wood, \$45.

FLOUR.—State, superfine brands, \$5.25 a \$5.20; Ohio, common brands, \$3.35 a \$3.40; Ohio, good and choice extra brands, \$5.96 a \$6.75; Michigan, Indiana, Wisconsin, &c., \$3.40 a \$5.55; Genesee, extra brands, \$5.55 a \$7.50; Missouri, \$5.40 a \$7.50; Canada, \$5.50 a \$6.75; Virginia, \$6.25 a \$7.25; Rye flour, fine, \$3.75 a \$3.90; corn meal, \$3.75 a \$3.80.

HEMP.—American undressed, \$120 a \$150; dressed, from \$160 a \$300. Jute, \$57 a \$50. Italian, \$275. Russian clean, \$190 a \$200 per ton. Manilla, 6½c. per lb. Sisal, 5½c.

INDIA-RUBBER.—Para, fine, 55c. per lb.; East India, 50c.

INDIGO.—Bengal, \$1 a \$1.55 per lb.; Madras, 70c. a 95c.; Manilla 60c. a \$1.15; Guatemala, \$1 a \$1.25.

IRON.—Pig, Scotch, per ton, \$24 a \$25; Bar, Swedes, ordinary sizes, \$25 \$26; Bar, English, common, \$23.50 a \$24; Refined, \$22 a \$24; Sheet, Russia, 1st quality, per lb., 11½c. a 11½c.; Sheet, English, single, double and treble, 3½c. a 3½c.; Anthracite pig, \$24 per ton.

IVORY.—Per lb., \$1.25 a \$1.80.

LATHS.—Eastern, per M., \$2.13½.

LEAD.—Galena, \$5.50 per 100 lbs.; German and English refined, \$3.65 a \$5.70; bar, sheet and pipe, 5½c. a 6c. per lb.

LEATHER.—Oak slaughter, light, 20c. a 21c. per lb.; Oak, medium, 20c. a 22c.; Oak, heavy, 22c. a 31c.; Oak, Ohio 29c. a 30c.; Hemlock, heavy, California, 19c. a 22c.; Hemlock, buff, 15c. a 18c.; ordovan, 50c. a 60c.; Morocco, per dozen, \$18 to \$20; Patent enameled, 16c. a 17c. per foot, light Sheep, morocco finish, \$7.50 a \$8.50 per dozen; Calf-skins, oak, 57c. a 60c.; Hemlock, 56c. a 60c.; Belting, oak, 22c. a 24c.; Hemlock, 22c. a 24c.

LIME.—Rockland, 80c. per bbl.

LUMBER.—Timber, white pine, per M. feet, \$17.75; yellow pine, \$35 a \$36; oak, \$18 a \$22; eastern pine and spruce, \$14 a \$15; White Pine, clear, \$15 a \$40; White Pine, select, \$25 a \$30; White Pine, box, \$14 a \$18; White Pine, flooring, 1½ inch dressed, tongued and grooved, \$24.50 a \$25; Yellow Pine, flooring, 1½ inch, dressed, tongued and grooved, \$29 a \$32; White Pine, Albany boards, dressed, tongued and grooved, \$20 a \$21; Black Walnut, good, \$45; Black Walnut, 2d quality, \$30; Cherry, good, \$45; White Wood, chair plank, \$12; White Wood, 1 inch, \$23 a \$26; Spruce flooring, 1½ inch, dressed, tongued and grooved, each, 22c. a 24c.; Spruce Boards, 15c. a 17c.; Hemlock Boards, 12½c. a 14c.; Hemlock wall strips, 10c. a 11c.; Shingles, cedar, per M. \$28 a \$25; Shingles, cypress, \$12 a \$25; Staves, W. O. pipe, light, \$55 a \$50; Staves, white oak, pipe, heavy, \$75 a \$80; Staves, white oak, pipe, culls, \$30 a \$35; Staves, do. hid., heavy, \$70; Staves, do. bbl. light, \$20 a \$35; Staves, do. bbl. culls, \$20; Mahogany—St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c.; Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut, 3½c. a 3½c. per lb.; American clinch, 5c. a 5½c.; American horse-shoe, 14½c.

ONIONS.—Olive, Marseilles, baskets and boxes, \$3.40 a \$3.50; Olive, in casks, per gallon, \$1.12 a \$1.25; Palm, per pound, 9c. a 9½c.; Linseed, city made, 57c. a 58c. per gallon; linseed, English, 57c. a 60c.; whale, fair to prime, 49c. a 52c.; whale, bleached 59c. a 60c.; sperm, crude, \$1.27 a \$1.41; sperm, unbleached winter, \$1.45; lard oil, No. 1, winter, 87½c. a 92½c.; red oil, city distilled, 65c.; Wadsworth's