

(27) R. O. asks how to make a hair dye like that used by barbers. A. Cleanse the hair with dilute ammonia water. Then moisten it uniformly with dilute solution of gallic acid or ammonium sulphide, and go over it with a comb moistened with solution of one part nitrate of silver in nine parts of water, touching the scalp as little as possible. Stains may be removed by applying a little dilute solution of iodine in iodide of potassium dissolved in water, and then with solution of sodium hyposulphite.

(28) L. W. D. asks: Do you know of any material or process by which a fine gloss, white finish, on wood can be obtained without the use of damar varnish? A. You might try spirit copal or shellac varnish, and polish down with pumice stone or rotten stone and oil.

(29) G. W. S. asks: 1. Are not blinds that are used on horses' bridles injurious to their eyes? A. We think not. 2. When Paris green is sprinkled on vegetables will the dew and air draw the poison out so that it will be less fatal if eaten? A. No.

(30) C. C. H.—The "oiled tissue" you send is goldbeater's skin, prepared from the peritoneal membrane of the cæcum, which, as soon as it is detached, is stretched and dried, soaked in a weak solution of potash, and stretched on a frame. While in this position a similar membrane is applied to it so that the surfaces which adhered to the muscular membrane of the intestine come together. They unite perfectly and soon dry. They are then glued to frames, washed with alum water, dried, washed with solution of isinglass in wine to which spices have been added, and varnished with white of egg.

(31) A. U. asks: 1. How are opals separated from the matrix? Are there any machines that can be used for that purpose? A. Consult Traill's "Treatise on Quartz and Opal." Emanuel's "Diamonds and Precious Stones," and Byrne's "Handbook for the Artisan." The latter contains a good article relative to the best methods and machinery for such work. Address the booksellers and dealers in machinery who advertise in this paper. 2. Is there likely to be a market for these stones in America? The specimens are very brilliant fire opals, and I have seen pieces two inches in diameter and half an inch thick. A. Yes.

(32) E. M. asks: 1. Can Jupiter's great spot be clearly seen with the telescope described in SUPPLEMENT, 252? A. Yes, when an achromatic objective is used.

(33) C. B. C. asks: How is chloride of silver made? A. Although it may be formed by the direct union of chlorine with silver the easier and better way is to dissolve chloride of sodium (common salt) in water in one vessel, and nitrate of silver in another, distilled water being used by preference for the latter. Now pour the one solution into the other, and instantly there will be formed a dense, white, curdy precipitate. Next pour off the supernatant fluid and add plain water two or three times to wash the chloride free from the traces of the nitrate of soda, the other product of the decomposition. The combining equivalent of nitrate of silver being 170, while that of chloride of sodium is 58.5, these proportions should be adhered to when dissolving the salts. The proportion of water is immaterial.

(34) L. B. F. wishes a receipt for making an acid-proof cement. A. It would have been desirable had particulars of the object for which it is required been given, as acids act so differently upon different substances. A mixture of equal parts of pitch, resin, and dried plaster of Paris is much used as a cement in chemical works where sulphuric acid is prepared. Troughs for holding acids may be effectively cemented by the following: Resin, 6 lb.; dried red ochre, 1 lb.; calcined plaster of Paris, ½ lb.; linseed oil, ¼ lb. These must be incorporated by well stirring together when melted. For smaller purposes an alcoholic solution of shellac, or a solution of bitumen in benzol, answers well. To render this latter less brittle, it is desirable to add a few drops of a solution of India-rubber. Marine glue also resists acids. It may be formed of India-rubber 1 part, digested, with heat, in a covered vessel containing 12 parts of mineral naphtha, to which, when solution is effected, 20 parts of powdered shellac are added. When liquefaction is complete pour out on a slab to solidify.

(35) J. R. S. writes requesting information respecting the recently introduced methods of obtaining reproductions of writing in inks of any desired color. A. Pour into a flat zinc trough, or upon a zinc plate having the edges turned up a quarter of an inch, a warm solution of the following substances: Water, 130 parts; sulphate of baryta, 75 parts; sugar, 30 parts; gelatine, 30 parts; glycerine, 180 parts. This mass when cool becomes stiff and forms the printing surface. The writing to be reproduced is written with any suitable ink, methyl violet being generally preferred; and this, when quite dry, is laid down upon the gelatine film and the hand rubbed over it. By this operation the ink is absorbed. Quite a number of impressions may now be obtained from this gelatinous surface, by laying upon it a sheet of paper and rubbing with the palm or edge of the hand. If the weather be very hot, to prevent the film from becoming sticky the proportion of baryta above given may be increased to 100 parts. By the following modification of this process the plate may be inked like a lithographic stone, and thus be made to yield an indefinite number of impressions in ink of any color. The proportion of water must be reduced, and the ink with which the writing or drawing is made must contain alum. On theoretical grounds the best ink to employ would be a saturated solution of the alum to which was added enough common writing ink to give it color. A wet sponge having been passed over the gelatine surface, the writing is laid down, and after the lapse of a few moments it is removed, when the writing will be found to be eaten into the film as if engraved. A roller charged with printer's ink is now passed over the surface, which, when properly inked, will now yield any required number of impressions. By preference the inking roller should be formed of India-rubber; fresh inking must be had recourse to after each impression has been taken.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

H. R.—Barytocalcite— $\text{BaCO}_3 + \text{CaCO}_3$.—J. S. W.—No. 1 is dolomite—magnesian limestone. No. 2, datholite—a hydrated borosilicate of calcium.—M. B.—The gravel contains no metals. The bright particles are mica and a little iron sulphide pyrites. The rock is quartzose, carrying a little chalcopryite—iron-copper sulphide.—P. S.—It is lead sulphide—galena; may contain a trace of silver.—J. P.—It is blast furnace scoria—not a native mineral.—W. T.—A sandstone saturated with petroleum.

COMMUNICATIONS RECEIVED.

On Inventors' Academy. By E. W. S.
On Railroad Rail Binding. By E. A. S.
On a Curious Icicle. By E. M.
On Rainfalls. By J. T. N.

NEW BOOKS AND PUBLICATIONS.

THE AMERICAN CHEMICAL JOURNAL.

The number for December contains several very able articles, among them the following papers: "Researches on the Complex Inorganic Acids," by Wolcott Gibbs. "Estimation of Alkaloids by Potassium Mercuric Iodide," by Albert B. Prescott. Contributions from the Chemical Laboratory of Harvard University: "On the Ethers of Uric Acid: Dimethyluric Acid," by H. B. Hill and C. F. Mabery. "Researches on the Substituted Benzyl Compounds; Orthobromobenzyl Compounds," by C. Loring Jackson and J. Fleming White. "The Constitution of the Tartrates of Antimony," by F. W. Clarke and Helena Stallo. "On the Relative Stability of Certain Organic Salts," by Miles Beamer and F. W. Clarke. "Some New Salts of Uranium," by F. W. Clarke and Mary E. Owens. "Graphite from Ducktown, Tennessee," by W. I. Dudley and F. W. Clarke. "On the Distribution of Arsenic in the Human Body in a Case of Arsenical Poisoning," by S. W. Johnson and R. H. Chittenden. "Synthesis of Salicylic Acid," by Edgar F. Smith.

THEORIE DER GEWOELBE (THE THEORY OF VAULTS). By A. Foeppel. Leipzig: Arthur Felix, 1880. 152 pp.

This work is divided into four chapters, of which the first embraces the "Elementary Theory of Barrel Vaults," their conditions of stability, the graphical calculations for obtaining the pressure line, etc. The second chapter treats of the "Theories of Elasticities" in barrel vaults; the third chapter is devoted to the theory of the pressure and elasticity in domes; whereas the fourth treats of groined arches. This work was not intended for the beginner, as it requires considerable acquaintance with the subject; but for such persons it will be found to be of great value, as it contains a large store of information, especially in regard to modern developments and the elasticity of vaults.

[OFFICIAL.]

INDEX OF INVENTIONS

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[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

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