

(36) C. R. C. says: In Fowne's "Chemistry" it is stated that picric acid is also one of the ultimate products of the action of nitric acid upon indigo and numerous other substances, as silk, etc. The way to produce it from indigo is given in detail. Will the same method answer for silk? A. Yes; but the quantity of the acid obtainable from this source is small, and difficult to isolate from the numerous other products of the decomposition. Its presence among these products is, therefore, only a matter of scientific interest.

(37) C. Roggenkamp, of Appingedam, Holland, asks: 1. What is quicklime? A. It is the anhydrous oxide of calcium. It is commonly prepared from limestone or marble (calcium carbonate) by ignition in a kiln. The carbonic acid is thus driven off, together with the moisture. 2. What is plaster of Paris? A. It is the anhydrous sulphate of lime (Ca SO₄).

(38) J. C. M. asks: How can I make ferro-tartaric acid? A. Dissolve pure sulphate or chloride of iron in distilled water, and add to this a strong aqueous solution of pure soda (or carbonate of soda) in excess; heat nearly to boiling, filter, wash the precipitate thoroughly with hot water, and dry. Then add to this an equal weight of citric acid, and about 20 times its weight of pure water, and allow to stand at a temperature of about 170° Fah. for 24 hours in a covered vessel. Dilute a little if necessary, filter, and evaporate the filtrate (which contains the acid tartrate of iron) to dryness over a water bath.

(39) E. W. W. asks: How can I take bluing stains out of a red and white crumb cloth? A. If ordinary bluing were used, boiling in a little hot water should remove the stain. If not, let us know what kind of bluing was employed, and in what way.

(40) C. H. H. asks: What is the best method of generating carbonic acid gas for use in soda fountains? A. The materials commonly employed are dilute sulphuric acid and coarse marble dust. Use marble dust 10 lbs., water 30 lbs. (about 4 gallons), oil of vitriol 15 lbs.

(41) H. T. D. asks: 1. How can I coat metal with hard rubber? A. Cover the parts well with gum rubber, and then heat in melted sulphur until the degree of vulcanization desired is reached. Experience will best teach you the proper conditions. The efflorescent and adhering sulphur may be removed by hot solutions of potash or soda. 2. What shall I use for covering a rack for holding work in a plating solution, to prevent deposit, and also to resist the action of soda or potash lye? A. Try successive coatings of solution of caoutchouc. It would be better to make a rack of glass, or glass and hard rubber (ebonite).

(42) J. J. W. asks: What is a good brown dye for straw hats? A. Try the following: First dry the straw thoroughly, then steep for a short time in a strong solution (neutral) of sulphate of copper. On removing the material from this, dry again, and immerse for about five minutes in a weak solution of ferrocyanide of potassium.

(43) H. J. asks: I have a set of rabbit furs. They are soiled by the hair. How shall I clean them? A. We do not know of a less objectionable method than that of the application of benzole (not benzine) and some absorbent material, such as paper pulp (dry and warm) or pipe clay.

(44) P. R. H. asks: 1. Please give me an analysis of the purest Lake Superior native copper? A. It consists, generally, of pure copper, but often contains both silver and mercury, sometimes as much as 7 or 8 per cent of the former. 2. Of what are the ridges on copper implements composed? A. They are probably points that have been covered with organic or other unchangeable material, that has offered more or less protection to the metal beneath. The non-corrosion of the metal at these points may also to some extent be attributable to the small masses of silver which are sometimes found with the copper. 3. Can copper be cast? A. Copper may be cast, but the castings are, for the most part, useless, owing to their non-homogeneous character, and the numerous blowholes which they contain. 4. Are there any castings made of pure copper? A. No.

(45) A. H. says: In Machinery Hall at the Centennial, I saw in the exhibit of a compressed air railroad brake a wooden ball, dancing in a strong current of air which was escaping from the apparatus. Please explain why the ball did not leave the stream of air and fall to the ground. A. The explanation, with diagrams, was published in SCIENTIFIC AMERICAN SUPPLEMENT No. 37.

(46) J. H. L. asks: How can I get a humming or whistling noise out of a tin tube attached to a wheel of 2½ inches circumference? The tube is 1 inch long by ¼ inch wide, and the wheel runs at 60 turns a minute. A. It will probably be necessary to allow the tube to project some distance beyond the rim of the wheel, with one side a little longer than the other.

(47) C. C. P. and others.—The aniline colors are not, in themselves, poisonous; the poisonous qualities are attributable to the small trace of arsenical compounds to be found in almost any of these commercially prepared dyes. It has been found necessary to employ arsenic acid in the preparation of these beautiful and, at present, indispensable colors; and the best that we can do, under the circumstances, is to avoid placing any colored fabric suspected to owe its tints to the aniline dyes, in contact with the cuticle, especially of children.

(48) C. J. H. asks: 1. Is there any way to determine the presence or absence of carbolic acid, chloride of lime, and copperas in a mixture of gas tar and brick clay? A. Yes, but we do not

think it probable that notable amounts of the substances enumerated would be likely to exist in such a mixture. 2. If so, can I do it myself? A. It would require the skill of a chemist. We do not think that any instructions we could give you here would enable you to make a satisfactory analysis of the material.

(49) D. W. H. says: I am engaged in manufacturing an article into which liquid ammonia of 16° proof enters largely. I am informed that it can be made very cheaply from sulphate of ammonia and lime, and that the apparatus for making 25 to 60 gallons per day is not expensive. What do I need in the way of apparatus? A. All that is requisite is a large iron retort in which to heat the mixture of ammonia salt and lime, and a suitable absorption apparatus, preferably a series of large Woulfe's bottles, partially filled with pure cold water. The proportion of caustic lime and ammonia salt employed should be about equal weights. In order to free the ammonia gas from impurities before dissolving it in the water, it is advisable to pass it through an iron worm surrounded by cold water, and then through a strong solution of potash.

(50) C. C. B. says, in reply to a correspondent who asked as to the origin of the \$ mark: By the ancients the pillars of Hercules (Gibraltar) were regarded as marking the end of the world; and the two pillars are displayed on ancient coins, bearing a fillet between them with the motto *plus ultra* (nothing further, or nothing beyond). On the discovery of America by Columbus, Spain, with pardonable vanity, stamped her dollars and other coin with the same pillars, and threw between them a fillet bearing the motto *plus ultra* (further yet). The mark \$ thus designated the Spanish dollar, and in time the American.

(51) J. W. W. says, in reply to J. A. P. who asked how to make apple butter: Take any quantity of fresh unfermented cider and boil it down to half its quantity. Then add fresh ripe apples which are quartered and deprived of their cores. Continue the boiling, stirring all the time with a wooden paddle to prevent burning and adhesion to the sides of the kettle. The boiling is to be continued until the butter is of the proper consistence, when it is put away in jars or kegs for use. If the butter is made properly, it will keep all winter in a perfect state of preservation.

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

R. M.—Both specimens contain gold.—W. S. V.—No. 48 contains a considerable quantity of iron pyrites. No. 49 is orthoclase, a silicate of alumina, iron, lime, and potassa.—No. 50 is not of natural occurrence. It is a furnace product, probably speigeleisen, a carburet of iron containing manganese.—L. W. S.—The curious piece of wood you send us appears to have been taken from the shell immediately surrounding the pith of the log, and has subsequently been subjected to a process of rolling or pressure, which has imparted to it its remarkable suppleness and strength. We should like to have further particulars concerning the material, as your letter is not quite clear.—H. G. S.—It is speigeleisen, a carburet of iron containing manganese. It is not an ore.—D. A. C.—It is hornblende.—J. M. L.—It is trap rock containing iron pyrites.—E. C.—It is hornblende with quartz containing iron pyrites or sulphide of iron.—J. D. S.—It is a limestone (marble), but contains too much alumina to be useful for lithographic purposes.—J. W. G.—It is a species of rock very closely resembling that employed for lithographic purposes. It might, we think, answer for that purpose.—W. W. S.—It is a sand formed by disintegrated granite of quartzose rock, containing minute spangles of iron pyrites, but no silver.—G. L. W.—It is a quartzose rock slightly discolored by iron. It may contain a small quantity of gold, but this could not be determined without a qualitative analysis.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On a New Form of Chuck. By C. R. W.
On Locomotive Drive Wheels. By G. C.
On Working Men's Demonstrations. By J. G.
On Keeping People Employed. By D. M.

Also inquiries and answers from the following: J. D. F.—E. M. S.—H. F. W.—E. T. P.—B. L. T.—W. N.—J. C. D.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells nautical instruments? Where can gyroscopes be bought? Whose is the best lightning rod? Whose sells photographic apparatus? Why do not makers of guns and rifles advertise in the SCIENTIFIC AMERICAN? Who makes drop presses? Who sells portable boats, that can be folded up?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL]

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FOR WHICH Letters Patent of the United States were Granted in the Week Ending September 5, 1876, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, 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.

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