

the files of this paper. In our SUPPLEMENT, Nos. 192 and 425 and in others also, processes are given. 5. In plating articles of iron, tin, etc., with copper, the copper scales off and will not adhere firmly. How can I remedy this? A. You should use an alkaline copper bath, until the metal is covered, then you can finish in the ordinary bath. A cyanide bath will answer. You should have some good treatise on the subject, such as is contained in our SUPPLEMENT, No. 310. 6. In what number of the SCIENTIFIC AMERICAN can I find the article on the isolation of fluorine? A. SCIENTIFIC AMERICAN SUPPLEMENT, No. 577, contains a full descriptive and illustrated article. 7. What is the true height of the Eiffel tower, 984 or 1,178 feet? A. 300 meters or 984 1/4 feet. 8. In what way does the Geissler differ from the Sprengel air pump? A. See our SUPPLEMENT, Nos. 629, 630, and 631, for full description and diagrams of all leading mercurial air pumps. 9. How can I purify mercury for use in a barometer? A. Distill it from an iron retort. 10. Will I be permitted by the Bell Telephone Company to make and use the telephone described in SUPPLEMENT, No. 142? A. You will be open to suit for infringement. They can only stop you by procuring an injunction in a federal court. 11. From what is beer yeast obtained? A. From fermenting malt infusion. 12. What work on electricity can you recommend? A. There are a very large number of excellent works devoted to the different branches of the subject, any of which we can supply. We suggest Ayrton's Practical Electricity, \$2.50; Electricity in the Service of Man, by Wormell, \$6; Larden's Electricity, \$1.75.

(804) J. P. wants to know how to oxidize brass by a dip so as to give it a cherry color. A. For brass dip changing the color through brown to a full red. Solution of 1 pint water, 16 drachms nitrate of iron, 16 drachms hyposulphite of soda. Another solution is 1 pint water, 16 drachms hyposulphite of soda, 1 drachm nitric acid.

(805) C. A. K. S. writes: Can you furnish me with the receipt for making Worcestershire sauce? A. Mix together 1 1/2 gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, 1/2 gallon of Madeira wine, 1/2 gallon Canton soy, 2 1/2 pounds moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1 1/2 ounces each of pimento and coriander, 1 1/2 ounces chutney, 3/4 ounce each of cloves, mace, and cinnamon, and 6 1/2 drachms asafetida dissolved in 1 pint brandy 20 above proof. Boil 2 pounds hog's liver for 12 hours in 1 gallon of water, adding water as required to keep up the quantity, then mix the boiled liver thoroughly with the water, strain it through a coarse sieve. Add this to the sauce.

(806) R. & V. H. (Neb.) ask: Can there not be some use made of the hundreds and thousands of plow shares and mould boards of plows that now lie around our blacksmith shops in the great West? A. A new lay or share costs from \$3 to \$4, and a mould board from \$6 to \$8. It seems that the steel in the old and partly worn ones ought to bring something. A. Iron and steel in any form has a market value in the Eastern and Middle States. First quality cast iron scrap is worth \$12 per ton. Second quality, such as chilled plow points, \$8 to \$10 per ton. Cast steel scrap, first quality, \$18 per ton. Second quality, such as steel mould boards, \$16 to \$17 per ton. You should be able to find a ready market for steel scrap in Chicago.

(807) A. H. T. asks: 1. What is the relative manufacturing cost of pressed and blown glassware? A. Pressed glass is the cheapest for plain goods. A comparison cannot be fairly made in general terms for pressing is a necessity in cheap figured goods, which cannot be made by blowing alone. 2. Can thin ware like thin tumblers be made by the former process? A. The thin goods so much in vogue now cannot be pressed and retain the fine, clear qualities of the blown goods. 3. Can pressed ware be accurately enough made to form close joints in articles made in sections, or is grinding necessary? A. There is a possibility of making jointed articles that are to be closed with rubber, but a tight glass to glass joint without packing cannot be thus made.

(808) P. B. M. asks: What velocity has air driven out of a 4 inch by 4 inch square pipe, two feet from end of it? Running at velocity of 130 feet per second from out of the pipe. A. There are no data for the decreasing velocity of air projecting from a nozzle. The vortex produced by contact with the outside air of the same specific gravity commences at the nozzle, so that at two feet distance the central portion of the blast would retain most of the initial velocity, while the outer portion would be greatly retarded by admixture with and putting into motion the surrounding air. The velocity is no doubt inversely in proportion to the distance that the blast is felt, so that if the blast produces a perceptible movement at 50 feet distance, then 127 feet would be the approximate velocity at 2 feet from the nozzle for the central portion.

(809) A. H. M. asks for a recipe for staining pine, ebony or black, a black that acids will not discolor. A. Boil 40 parts gall nuts, 4 parts rasped logwood, 5 parts sulphate of iron and 5 parts verdigris with water. Strain through linen and apply the warm fluid to the wood, and then give it three coats of a warm solution of 10 parts of iron filings in 75 parts of vinegar. Toprevent discoloration of the stained wood by acids, polish the surface with paraffine.

(810) G. E. C. communicates the following: This formula has given perfect satisfaction as a flour paste for all purposes. Mix 1 pound rye flour in lukewarm water to which has been added one teaspoonful of pulverized alum; stir until free of lumps. Boil in the regular way or slowly pour on boiling water, stirring all the time until the paste becomes stiff. When cold add a full quarter pound of common strained honey, mix well (regular bee honey, no patent mixture). In labeling I always paste my tin (or my work) and apply my label except where I have a narrow label, and pasting the tin would mar the other work, but where the paste is put on tin we find it to hold perfectly.

(811) J. O. B. asks for the best composition of bell metal for tone for musical bells. A. Nothing but copper and tin should be used for such bells. The composition varies for tone from 16 ounces copper and

4 ounces tin to 16 ounces copper and 3 1/4 ounces tin. The first gives the finer tone. See Query No. 801.

(812) T. O. D. asks how long compressed air (300 pounds pressure) would remain in an iron tank provided there was no leakage through valves. A. The air at that pressure will remain for an indefinite time without leakage. The tank should be tested by placing a little ether in the suction of the compressor, when, if there are any leaks, they can be found by the smell, in the same manner as gas fitters find leaks in gas pipes.

(813) H. M. E. asks: What is the principle of the Ericsson calorific engine? A. See description of Ericsson's calorific engine, illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 70.

(814) M. L. Co. — Mica of fine, clear quality and large size is much used in the stove trade and for miners' lanterns. Refuse mica is used for paint body by grinding.

(815) S. I. asks: What is phenol-phthalic acid, and where could it be obtained, as I wish to procure some for analytical purposes? A. It is an organic compound based on phenol, two hydrogens of the original benzol group being displaced by 2C₆H₄O₂. It is sold by dealers in chemical supplies.

(816) S. S. writes: A piece of metal composed of gold and silver weighs 22 ounces in air and 20 1/2 ounces in water. What proportion of said metal is gold, and what proportion silver, assuming the specific gravity of gold to be 1934, and silver 1050. A. 22-20 1/2 = 1 1/2 = the weight of water displaced by 22 ounces of the alloy. Its specific gravity therefore is $\frac{22}{1\frac{1}{2}} = 1466$.

Taking one hundred parts as the basis, and denoting parts of silver by x and of gold by y, we have the following equations:

$$(1) x + y = 100$$

$$\text{and } 105x + 1934y = 100 \times 1466 = 146600.$$

Solving these we find

$$x = 55.23 \text{ parts in } 100$$

$$y = 44.77 \text{ " " " "}$$

(817) J. A. D. writes: Are there any means by which a man might efface marks that have been tattooed on his hands by means of dye stuff? A. We refer you to our SUPPLEMENT, No. 695, for an article on the above subject.

(818) E. V. writes: 1. Can you tell me a good remedy for pimples? A. Lead a perfectly healthy life and eat moderately of simple food. Bathe the face with a solution of Rochelle salts. 2. A receipt to whiten hands? A. Wear gloves, wash the hands frequently with best quality soap, and occasionally with javelle water.

(819) H. H. asks for a recipe for an effective gargle. A. For a very mild one use salt and water; for a more effective one use about 1 drachm chlorate of potash in 2 ounces of water, or 1/2 to 1 ounce alum in 1 pint of water sweetened with honey. The chlorate of potash gargle must be used with care, as it is poisonous.

(820) A. E. M.—The sample is magnetic iron ore. We can take charge of the assay. It will cost \$5 for determination of iron, determinations of sulphur and phosphorus will cost \$5 apiece. We should be glad in any case to have you send four or five pounds by express to our address for our further examination.

(821) W. P. H. asks (1) how to clean carpets on the floor to make them look bright. A. To a pailful of water add three pints of oxgall, wash the carpet with this until a lather is produced, which is washed off with clean water. 2. How to take out varnish spots from cloth? A. Use chloroform or benzene, and as a last resource spirits of turpentine, followed after drying by benzene.

(822) W. H. P. asks for a good carbon or manifold paper, such as used in operating type writers. A. Melt together 1 part beeswax and 6 parts of lard oil, and mix in lamp black and a little Prussian blue. As regards proportions of coloring matter, use judgment. It should be done in a warm mortar. In place of above coloring matter you may use logwood carmine or any good form of dry pigment.

(823) J. M. F.—Iron pyrites, no value, composed of sulphur and iron.

(824) J. B. C. asks whether a form of wood, flat or other shape, could be coated with a film of copper that could be separated from the wood without injury to either, so that the wood could be used again. A. Yes; dry the wood, immerse in hot paraffine, coat with plumbago, and plate with a battery. See our SUPPLEMENT, Nos. 157, 158, and 159, for batteries, and No. 310 for electro-plating.

(825) A. B. writes: 1. An electro-magnet of certain dimensions, with the wire wound in one piece, will sustain 145 lb. With the same wire cut into seven pieces it sustained 750 lb. Were the seven pieces wound side by side or did each piece form a layer? A. The seven pieces may have been wound side by side or in different layers. This of itself makes no difference. It is probable that the pieces were connected in parallel circuit, so as to enable the wire to take a heavy current. 2. Please describe a commutator. One suitable for a two inch Simmes armature. A. For description of commutator see SUPPLEMENT, No. 600.

(826) Student asks: 1. How are the red, blue, and black characters put on society pins? A. The colors referred to are put on by means of enamel, which is fused upon the surface of the metal. 2. What is the best battery for running an electric motor, and what are the materials used in making it? A. Use a plunging bichromate battery. 3. Is there any way to tell the amount of wire needed on the field magnets and armature of an electric motor, if you know the size of the magnets and wire? A. Consult Hering's "Dynamo-Electric Machinery."

(827) C. E. R. writes: I am interested in plating with gold. Can you inform me or tell me where I can get information as to the right solution to use and the manner of making and using such solution? A. For a brief and reliable treatise on electro-plating with gold and other metals we refer you to our

SUPPLEMENT, No. 310. We can also supply you with the standard works on the subject, such as Watts' Electro-Deposition of Metals, \$3.50.

(828) W. H. L. asks: If lily of the valley flowers (in quantity) are put into Atwood's alcohol, 95 per cent, will the alcohol absorb the perfume? A. To a very limited extent only. The perfume should be extracted by maceration in oil or grease or by simple absorption by grease, and then obtained as an alcoholic extract if desired. We can supply you with books on the subject of perfumes at regular price.

(829) W. J. P. writes: Is there any way to give brick the red color of those burned from clay rich in oxide of iron? Would it probably be too expensive to mix ground uncalcined oxide with the clay? Mixing ordinary black loam with clay affects the color to some extent, but is apt to injure the strength of the brick. Putting salt in the fire near the close of a burning to a limited extent gives a dark red to the brick, but this is apt to take place only where the brick are subject to a great heat. What is the chemical action of this last? A. We doubt if you obtain any practical success by such mixture, owing to the expense and difficulty of securing a homogeneous mixture. As regards the chemistry of the salt process, it may operate as a flux, fusing with the light colored silicious portions into a colorless glass, and not affecting the iron oxide, or it may even volatilize some of the alumina as chloride. It is not easy to state its action without examination or analysis.

(830) H. F. K. — To mount prints on glass, follow the directions given by J. E. Dumont, that is, take four ounces of gelatine and soak half an hour in cold water; then place in glass jar, adding sixteen ounces of water; put the jar in a large dish of warm water and dissolve the gelatine. When dissolved, pour into a shallow tray. Have your prints rolled on a roller, albumen side out; take the print by the corners and pass rapidly through the gelatine, taking great care to avoid air bubbles. Hang up with clips to dry; when dry, squeeze carefully on to the glass. The better the quality of glass, the finer the effect. Also see page 120 of February 21, 1885, issue of the SCIENTIFIC AMERICAN. You can make transparencies on glass with photographic apparatus. See book called "The Amateur Photographer."

(831) A. R. asks (1) how to prepare a lacquer to keep brass tools from tarnish. A. The tools must be cleaned and polished so as to be absolutely free from grease. They are next slightly warmed and varnished with a solution of seed lac or shellac in alcohol. The success of the operation depends on the clearness of the surface. A finger touch before varnishing will affect the finish. 2. How can gold be tested as to its karat, besides the test stone process, and give more minute distinction than this latter? A. An analysis or assay is the only reliable method. Sometimes, the specific gravity is determined, and from this the composition is deduced by algebra, but the method is only approximate, and can only be used where the alloy or metal mixed with the gold is known. See next query

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