

(18) W. M. asks how to prepare linseed oil to give it a heavy body that will endure, for coating houses on which the paint is dull. A. Simmer, with frequent stirring, 1 gallon linseed oil with 3/4 pound powdered litharge until a skin begins to form, then remove the scum, and when it has become cold and has settled, decant the clear portions.

(19) H. C. H. asks whether, in laying out a trotting track, the distance is measured on the outside center or inside lines. A. All trotting and running tracks are measured 3 feet exactly from the inside curve or pole. No allowances are made on the track for time or drivings. Athletic tracks are measured 18 inches from curve in America, and 12 inches in Great Britain.

(20) F. J. R. asks (1) what wash leather is. A. It is usually split sheepskin dressed with oil, in imitation of chamois. 2. Whether iron rods can be used in place of brass ones on the Carre's dielectrical machine with as good effect? A. Yes, except for liability to rust.

(21) W. L. A. asks how to soften light leather, such as in lines, saddles, bridles, etc., without discoloring it. A. It is not practicable to do this after the leather is made up. Rubbing well with oil and tallow, after a slight dampening, will soften the leather, but will also somewhat discolor it.

(22) U. H. P.—For soldering solution, See query 6. This also makes a good dipping solution for tinning everything but cast iron. We know of no way of tinning cast iron by dipping. It can be imperfectly tinned by scraping the surface clean and using a copper soldering iron with pure tin and sal-ammoniac.

(23) J. R. desires (1) a receipt for a good ink for soldiers' belts. A. Dissolve 3 sticks of the best black sealing wax in 1/2 pint spirits of wine; keep in a glass bottle and shake well previous to use. 2. A compound to give a durable polish. A. Put 1/2 lb. shellac broken up in small pieces into a quart bottle or jug, cover with alcohol, cork it tight, and put it on the shelf in a warm place; shake it well several times a day, then add a piece of camphoras large as a hen's egg, shake it well, and in a few hours shake it again and add one ounce lampblack. If the alcohol is good, it will all be dissolved in two days; then shake and use. If the materials were of the proper kind and the polish correctly prepared, it will dry in about five minutes, giving a gloss equal to patent leather. For a white belt use white shellac and zinc white finely powdered instead of the lampblack. 3. What should be mixed with logwood to make ink? A. See recipes for inks in SCIENTIFIC AMERICAN SUPPLEMENT, No. 157.

(24) W. C., Jr., asks: 1. How are cattle horns, which are sold in art stores, polished, dyed, and mounted? A. Boil the horn to remove the core, unless it is already out. Scrape with glass or a sharp knife, dipping the horn in hot water occasionally to keep it soft. When all the roughness and spots are off, rub with fine sand paper or emery paper. When smooth as it can be made in this way, take powdered pumice stone or rotten stone, with a flannel cloth and linseed oil, and rub lengthwise until all the sandpaper marks are removed; then rub with a clean flannel cloth till fully polished. It is said that after this a cotton cloth and, finally, tissue paper will produce a still higher polish. A pair of horns can be mounted by taking a block of wood long enough to extend into the horns, leaving them the original distance apart. Then fill the horns with wet plaster of Paris and push them on the ends of the block. When dry, they will be solid. Cover the block with satin or plush. 2. How are metal vessels glazed? A. See "Enamels and Glazes" in Spence's "Workshop Receipts," 3d series, p. 204 et seq. We can send the volume post paid for \$2. 3. If rain water becomes foul in a cistern, how can it be made pure, or how can it be kept from becoming foul? A. It can be purified by filtering through charcoal. There is no way to prevent its becoming foul except to keep the cistern clean, and have abundant access of air to the water.

(25) G. B. D. asks how to destroy vermin in a building. The building to be vacant. I wish something which will not destroy paint or wall paper. A. Close the windows and doors and burn sulphur. It will kill all vermin, but it will also bleach the wall paper. Unless you use sulphur, you will be obliged to fall back on borax and insect powder. Neither of which is radical.

(26) C. R. desires the receipt for preparing mocking bird food. A. Mix together 2 parts corn meal, 2 parts pea meal, and 1 part moss meal; add a little melted lard, but not sufficient to make the mixture too greasy, and sweeten with molasses. Fry in a frying pan for 1/2 hour, stirring constantly, and taking care not to let burn. This makes it keep well. Keep it in a covered jar.

(27) A. N. W. writes: 1. My plants are often infested with green lice, and sometimes with a small white fly or miller which remains on the under side of the leaf. Will you kindly give measures for destroying the insects? A. Take of quassia chips 3/4 oz., larkspur seed 5 drachms; boil these together in 7 pints of water until the decoction is reduced to 5 pints. When the liquid is cooled, it is to be strained and used with a watering pot or syringe, as most convenient. 2. What will kill carpet bugs or prevent their doing mischief to carpets and clothing? A. See "Sure Death to Buffalo Moths" on p. 112 of SCIENTIFIC AMERICAN for August 25, 1888. 3. Please give pronunciation of the word potpourri, and receipt for preparing the compound. A. Po'-poor-ee', see Webster's Unabridged Dictionary. During the rose season, gather a half peck of rose petals, take a large china bowl, strew a handful of table salt in the bottom, then three handfuls of petals, then salt and so on, until all petals are used. Let it remain five days, stirring and turning twice a day. They should now appear moist, when add three ounces of coarsely powdered allspice and one ounce bruised cinnamon. This forms the stock. Allow to remain a week, turning daily from bottom to top. Then put into

the permanent jar one ounce of allspice, and, adding the stock layer by layer, sprinkle between the layers the following mixture: One ounce cloves, one ounce cinnamon, two nutmegs coarsely powdered, some ginger root sliced thin, half an ounce anise seed bruised, ten grains finest musk, half a pound freshly dried lavender flowers, two ounces powderedorris root, orange and lemon peel, and such freshly dried flowers violets, tuberose, clove pinks or other varieties of highly scented flowers. Then add cologne, rose or orange and Florida water and any fine extract that will greatly add to the perfume. Shake and stir the jar once or twice a week and open only during the daily odorizing given to the apartments. Add at pleasure the following essential oils: Jasmine, rose, geranium, vervain, musk, rosemary, or neroli.

(28) T. A. S. writes: I do a great deal of plating in silver by an old process, but have forgotten the manner of dissolving gold into a liquid state. As soon as I dissolve the silver I can commence plating, but the manner of dissolving the gold to make it fluid I cannot find. A. Gold is dissolved by boiling in aqua regia and the nitric acid expelled by adding hydrochloric. The resulting solution of chloride of gold is boiled nearly to crystallization and then is dissolved in water. For manipulation in connection with the battery, see the article on "Electro-Metallurgy" in SCIENTIFIC AMERICAN SUPPLEMENT, No. 310

(29) B. B. asks: 1. What will remove cod liver oil spots from flannel and cambric? A. See the table given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, for removal of oil and other spots from various fabrics. 2. How can I make pine or deal as white as new? A. Take one part calcined soda and allow it to stand 1/2 hour in 1 part slaked lime, then add 15 parts water and boil. Spread the solution thus obtained upon the board with a rag, and after drying, rub with a hard brush, and fine sand and water. A solution of 1 part concentrated sulphuric acid and 8 parts water will enliven the wood after above application.

(30) C. L. W. asks: 1. What is the process of transferring a lithograph from paper to glass, so that it will become transparent? A. First coat the glass with copal varnish, when nearly dry but still tacky press on the wetted picture, face downward, smoothly and tightly. Let it dry thoroughly. Next damp the paper and rub it off with the finger, leaving the picture to be looked at through the glass. 2. How to make imitation frosted glass. A. Make a saturated solution of alum in water and wet the glass with the liquid. It is advisable to have the glass in a horizontal position, as then the solution is not likely to drain off. 3. How to make a stain for glass for the following colors: Bright red, orange, brilliant green, blue, purple? A. The addition of aniline colors that are soluble in water to the foregoing mixture, or a varnish colored with aniline dyes, may be used, but, of course, they are not permanent.

(31) W. J. asks: 1. What kind of tree is used in some countries for making bread? Do they use the bark only? Is there any nutriment in common sawdust? A. The breadfruit tree (Artocarpus incisa) furnishes a fruit that resembles bread in taste. It grows in the Pacific islands and elsewhere in the tropics. The cassava tree (Manihot utilisima) is indigenous to Brazil, and is cultivated in other parts of South America. The root, which is tuberous, contains starch and a poisonous matter. The starch is separated and made into meal, which is used to make bread. There is no nutriment in sawdust. 2. Is the Shipman engine patented in England? A. Yes.

(32) J. E. B. asks how to make a composition for statuettes, one which has clean white color, is strong, hard, and not too expensive. A. Soak plaster of Paris in a solution of alum, bake it in an oven, and then grind it to a powder. In using it, mix with water, and to produce clouds and veins, stir in any dry color you wish. This forms an artificial marble, and is susceptible of a high polish.

(33) J. E. D. asks: Will sound of cannons, bells, etc., break glass? Is there any case on record? Will sound if confined split a door? A. The concussion following or incidental to loud sounds has broken glass, etc., but we doubt if any authentic instance of such destruction by sound alone can be cited. Sound could not split a door.

(34) C. L. K. asks: 1. Was an absolute vacuum ever attained? If so, in what manner? Was Torricelli's a complete vacuum? Was there not vapor of mercury in it? A. The nearest approach to an absolute vacuum probably contains some vapor of mercury. It is doubtful if an absolute vacuum was ever produced, although it has very nearly been reached, so great a rarefaction being obtained that the static discharge would not pass. 2. What is the cause of the blue color of the sky? A. This has long puzzled meteorologists. It is believed that it may be due to very fine particles of liquid water in the upper regions of the atmosphere. The question is discussed in Ganot's Physics under meteorology, and the cause assigned is based on Tyndall's researches on the decomposition of vapors by light.

(35) M. A. M. and A. K. ask how to manufacture chewing gum, such as is sold by confectioners. A. Take of prepared balsam of tolu 2 ounces, white sugar 1 ounce, oatmeal 3 ounces; soften the gum in water bath and mix in the ingredients, then roll in finely powdered sugar or flour to form sticks to suit.

(36) G. H. H.—Spence metal is composed of ferrous sulphide of iron (FeS) mixed with melted sulphur. The ferrous sulphide is made by roasting iron pyrites and pulverizing before adding to the melted sulphur. See account of its discovery and uses in SCIENTIFIC AMERICAN SUPPLEMENT, No. 222.

(37) B. M. asks: What should be the size of a pair of small cylinders, suitable to run steam tricycle, on same plan as the one described in SCIENTIFIC AMERICAN, February 18. Also height, diameter, and thickness of plate for boiler, and number and size of tubes for same. A. The two cylinders should be 2 in. diam., with 3 in. stroke; boiler made of 1/2 in. copper shell, 1/4 in. heads, riveted and brazed, and

20 seamless copper tubes 1 in. outside diameter and 1-16 in. thick. Diameter of boiler, 12 in.; height, 24 in.; fire chamber, 9 in. diameter, 10 in. high. Or you may use the smallest size Shipman boiler, with 30 lb. steam pressure, and should be able to go 10 miles per hour over ordinary grades.

(38) J. B.—A pendulum in a perfect vacuum and absolutely free from friction should continue to vibrate indefinitely, possibly perpetually. But a perfect vacuum and freedom from friction are impossible. Granting the possibility of freedom from atmospheric and other friction, the motion of the earth around its axis, and the displacement of the center of attraction by the motion of the moon, would finally bring the motion of the pendulum within the variability of the centers of attraction, so that if there should remain any element of oscillation, it would be imperceptible.

(39) F. W. P. asks: How much white oak wood will make as much steam as a ton of good soft coal, such as is used for furnace purposes? A. One cord is the mean of many trials. Of hickory a little less is needed, and with pine a little more, white oak being a medium for steam making.

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