

resin, inside and outside; drive in the resin with a hot iron. Any chemicals will either make the water hard or add to the odor of goods washed in it.

(8) W. S. R.—Cut dogwood in winter. To dry, heat in a drying room with open steam until the sap is cooked, then continue the heat by steam coils or otherwise, with a little ventilation, until thoroughly dry. The drying should not be hurried; 4 to 6 days is not too much time for good results.

(9) C. S. P. asks: Is it practical to use steam heating apparatus under a pressure of say 40 pounds steam, for power, and also to heat building needing some 1,800 feet of pipe, at same time returning water to boiler by gravity, without traps or pumps? A. Yes, provided the conditions for a gravity system are observed. For these it is advisable to consult with a steam-heating engineer.

(10) T. K.—Gas should be furnished to the burner under a pressure of 1/2 inch water pressure to be effective and economical. The pressure in the service pipes varies from 1 inch to 2 inches water pressure under the varying circumstances of shutting off or turning on of a large number of lights. The variation of the measure of the meter is too small for serious consideration under so slight a difference as 1 or 2 inches of water pressure.

(11) E. R. writes: I am about to build an engine; the cylinder is to be 4 1/2 x 2 1/2; what size boiler will I need? If made of one-sixteenth inch copper, what would it safely stand? What should be size of fly wheel, and what would be the power of such an engine? A. Your engine will be equal to a 1/2 horse power, and will require a boiler containing 9 square feet effective fire surface. A horizontal boiler 14 inches diameter, 2 feet long, lower half filled with 1 inch tubes in the same proportion as you will see by examining any horizontal tubular boiler. The shell should be made of 3/8 copper, riveted and brazed; head should be 1/2 inch thick. The tubes may be one-sixteenth inch, well expanded and edges turned. Three stay bolts, from head to head above the tubes, should be arranged to divide the space equally. If such a boiler is well made, it should be safe for 40 pounds working pressure. It should be made by a coppersmith that understands his business. Fly wheel may be 12 inches diameter and weigh 25 pounds.

(12) W. W. K.—A direct line pipe for water is always the best for economy in material, for tightness, and a large saving in friction. You can easily force water through 900 feet of pipe. To use it as a suction pipe will be rather difficult, from the great quantity of air to be pumped out and liability to lose the charge by leakage. You will, if the pipe be used as a suction, require a larger pump than usual and a good foot valve at the spring, and also will probably have to charge the pump and suction with water at the start.

(13) A. B. J. asks: 1. Has electricity ever been utilized for heating purposes to any practical extent, such as fusing metals, or the fusing of ores for making iron, such as is made in blast furnaces? A. No. 2. Do you consider it practicable that it can be so used? And could it be transmitted to the distance of 10 miles with any degree of certainty and regularity? A. It is not possible by any means at present known. 3. What is the relative heating power of gas as compared with coal, that is, how much coal is equal to say 10,000 feet of gas for heating purposes? A. About 1,500 pounds bituminous coal. Different coals vary very much in heating quality.

(14) C. A. L. asks if there is any way to make the hair turn gradually and permanently gray. A. No. The hair turns gray in the disappearance of the pigment from the hair, generally in consequence of age. You can bleach your hair with hydrogen peroxide. In this manner a very light color can be obtained.

(15) L. A. D. asks the cause of brewers' horses being so strong, and powerful, and fat. A. The horses are well selected from costly stock, and fed on best feed, not on the mash sold for feeding cows. Some of these horses are also great beer drinkers.

(16) C. H. F. asks: What are the composition and ingredients used in the manufacture of Cutler's carbolate of iodine inhalant? A. The following formula is considerably used; whether it is the specific make desired, we are unable to say: Compound tincture of iodine..... 180 minims. Carbolic acid No. 1..... 48 " Glycerine..... 1 fl. oz. Water..... 5 " Mix and expose to the sunlight until the mixture is entirely colorless. The proportion of carbolic acid and tincture of iodine may be largely increased without a corresponding addition of glycerine.

(17) F. W. P.—Parchment paper is made, by dipping ordinary unsized paper for 5 or 6 seconds in dilute sulphuric acid, and then washing with extremely weak ammonia.

(18) R. H. K. desires a remedy for skin burn. A. Take 6 drachms avoirdupois powdered borax, pure glycerine 1/2 ounce, rose water or elder flower water 12 ounces; mix. Its daily use as a cosmetic wash renders the skin beautifully soft and white, and prevents and removes chaps, sun burns, etc.

(19) C. A. S. writes: 1. Can you tell me why an iron smokestack rusts through quicker in the city than in the country? A. City air is always more corrosive, on account of the acids, etc., which are present in the atmosphere. 2. The ingredients in the Hamlin Wizard Oil? A. The formula for this article is given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 342.

(20) H. M. D. asks for a method employed in embalming (or preserving without stuffing) birds, animals, etc. A. By consulting the article on "Embalming the Dead," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 155, you will find the general modus operandi given. The solutions vary with different authorities. The following is one that has been extensively used in Paris: Mix together 5 pounds dry sulphate of alumina, 1 quart warm water, and 100 grains arsenious acid. Inject 3 or 4 quarts of this mixture into all the vessels of the body. This process is applicable to fish as well as birds and animals.

(21) J. S. Y. asks for information as to how black lead is cemented in the construction of crucibles, etc. A. After the graphite is ground to powder, it is mixed with a small proportion of china clay, varying according to the use for which the crucible is intended. To every 10 parts of graphite is also added 7 parts of a gray (Bavarian) clay, besides a little ground charcoal. These ingredients are mixed dry; water is afterward added, and the compound passes to a cast iron cylinder. After treatment in this apparatus the material emerges in the form of thick mud, and is at once moulded either by hand or machinery, the operation being performed in almost exactly the same way as by potters. The same may be said of the subsequent baking.

(22) F. H. W. asks (1) for a good recipe for making sticky fly paper to catch them alive. A. To one pound of resin add two fluid drachms of linseed oil. While the mixture is warm, spread it on foolscap paper. 2. How much mercury, either in cubic or weight measurement, confined in a glass bulb at base of the column of air, diameter inside of tube, will raise an increase of the temperature of water in height at approximately 100 cubic inches of mercury. 3. How much force in pounds or ounces would the mercury give on a piston inserted in the tube and in contact with the mercury, without danger of breaking glass tube or bulb of ordinary tubes of that size? A. The force would be very great; its development would depend on the thickness of the glass tube and bulb.

(23) G. D. S. asks: 1. What is the best method for hulling corn? A. The hull may be removed by beating in a mortar, or on a large scale by machinery. Corn may also be hulled by allowing it to soak over night in a dilute solution of lye. Any excess of lye can be removed by washing. 2. Can the Pyrethrum roseum, from which the Persian insect powder is manufactured, be successfully grown in the climate of Canada? A. The season is probably too short for cultivation in Canada. 3. What authority can I consult with reference to its cultivation? A. See "The Cultivation of Pyrethrum and Manufacture of the Powder," contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 299. As to your query about preserving eggs, it is best to coat the eggs in such a way that air cannot penetrate the shell. Paraffin is an excellent article for this purpose. See also "How to Preserve Eggs for the Market," contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 317.

(24) W. R. E. writes: Can you give me a process for making walks with gravel and coal tar, or whatever they use for that purpose? Want something that will set hard for a workshop floor, and resist water. A. Take 2 parts very dry lime rubbish and 1 part coal ashes, also very dry, and both sifted fine. In a dry place, on a dry day, mix them, and leave a hole in the middle of the heap as bricklayers do when making mortar. Into this hole pour the mixture, mix, and when as stiff as mortar put in three inches thick where the walk is to be; the ground should be dry, and beaten smooth; sprinkle over it coarse sand. When cold, pass a light roller over it; in a few days the walk will be solid and waterproof. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 82, under title of "The Best Footwalk Pavement," also Gen. Gillmore's "Treatise on the Construction of Roads, Streets, and Pavements" is an excellent work; we can send you for \$2.

(25) H. S. D. asks if nasal gleet in horses is contagious. Is there any remedy for it? If so, what is the best, and how given? A. The disease is not a contagious one. The usual treatment consists of the injection of an astringent solution of carbolic acid, or else of copper sulphate or zinc sulphate, through the maxillary sinus. As this operation is a delicate one, it is best performed under the direction of a veterinary surgeon. 2. Have they got the lenses of the Lick telescope perfected yet? Would it be possible to clarify obsidian? It appears to be very fine glass, but dark? A. The lenses are being manufactured under the direction of Messrs. Alvan Clark & Sons. Glass seems to have the best qualifications for lenses. It is doubtful if a piece of obsidian could be procured of suitable dimensions and quality for the lens, independent of its color.

(26) J. W. W. writes: I have two powdered substances; one I think is powdered borax, the other bicarbonate of soda. Will you please tell me how I can test them, to be sure as to the correctness of my experiments with them? A. If alcohol is poured over borax, with addition of a sufficient quantity of sulphuric acid to liberate the boric acid, and the alcohol is kindled, the flame appears of a very distinct yellowish green color, especially upon stirring the mixture; this tint is imparted to the flame by the boric acid, which volatilizes with the alcohol. The effervescence of sodium bicarbonate with an acid is one of the tests used to determine the desired mineral.

(27) J. W. asks (1) a good remedy for taking moles from the face. A. Croton oil under the form of pomade or ointment, and tartar emetic under the form of paste or plaster, have each been successfully employed for the removal of moles or birthmarks, thus: Take tartar emetic in impalpable powder 15 grains, soap plaster 1 drachm, and beat them to a paste. Apply this paste to nearly a line in thickness (not more), and cover the whole with strips of gummed paper. In 4 or 5 days eruption or suppuration will set in, and in a few days leave in place of the birthmark only a very slight scar. 2. A good remedy for removing freckles? A. Sulphocarbolate of zinc..... 1 ounce. Glycerine..... 12 " Rose water..... 12 " Alcohol..... 3 " Spirits of neroli..... 1/2 dm. Mix them. To be applied twice a day, leaving them on for half an hour to one hour.

(28) P. & Co. ask (1) whether cistern water that is caught from an iron or tin roof that is painted every year is unhealthy. A. The water does not necessarily become impure from its passage over a painted roof, but it is very likely to become so by dissolving out certain injurious constituents of the paints, such as lead, etc. 2. The probable age of a catfish that will weigh 50 pounds? A. There are so many variations

within each species of fish that there is no general rule of determining age by weight; and in fishes closely conforming to the species the rate of growth is extremely irregular, depending on amount of food and the more or less favorable circumstances. Some kinds of catfish attain to a weight as great as 300 pounds. Fish which rapidly grow to a definite size are short-lived, while those which steadily and slowly increase in size attain to a great age. Carp and pike have been ascertained to live beyond a hundred years.

(29) C. F. asks if the piston head to a locomotive engine works back and forward itself in the cylinder, or is it always on the forward motion, caused by the cylinder moving away from it. A. It always moves forward relatively to the rails, but back and forward relatively to the cylinder.

(30) W. C. B. asks if there is any receipt for making a cement to fasten a rubber tire on a bicycle that will be strong and yet flexible. A. Use ordinary rubber cement prepared as follows: Digest crude rubber cut fine with about four volumes coal tar, benzol, or naphtha in a well covered vessel for several days.

(31) C. F. R. writes: I am using paraffin black. When painting the iron parts of machinery for use, what shall I mix with the paraffin? A. Thin down with benzine. The paraffin consists of coal tar boiled down, with the addition of sufficient asphaltum to harden the mixture, and then benzine is added to thin it.

(32) A. P. A. asks how the inside of a cask or barrel can be treated so it will not make water taste, the water supposed to be medicinal. A. Coat the inside of your barrel with a lining of paraffine. This substance is not soluble at all in water, and, if properly applied to the wood, will prevent the contact of water with the barrel. To keep the water on account of its medicinal qualities should demand its immediate preservation in glass bottles.

(33) B. J. R. asks (1) how to make pear phosphates. A. Take Bartlett or other good pears; cut or chop fine, press, allow to settle, pour off supernatant liquid. To one pint of this pear juice add one pint acid phosphate and one pound sugar or enough to sweeten. 2. Is there anything in the least unhealthful in carbonating water by means of marble dust and sulphuric acid, etc., even if the water so carbonated is drunk freely? A. The method suggested is the one ordinarily used in the manufacture of carbonic acid for soda water, and when it is properly done, and the water held in proper vessels, is not considered unhealthful.

(34) F. M. Z. desires a good recipe to make Florida water. A. Dissolve in 1/2 gallon 90 per cent alcohol 1 ounce each oil of lavender, oil of bergamot, and oil of lemons, and of oil of cloves and cinnamon, 1 drachm each; add 1 gallon water and filter. Or, use oil of bergamot, 3 ounces; oil of cinnamon, 4 drachms; tincture of benzoin, 2 ounces; 75 per cent alcohol, 1 gallon. Mix and filter.

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