home use. The solder is melted with a common match. A. The fusible metal solder sold by peddlers is made with 50 parts tin, 25 parts lead, 25 bismuth.

(883) A. J. R. asks: What is the cheapest way to transmit 5 horse power 150 feet, to use it cutting feed to fill a silo? I use it but a few days each year. A. For only temporary use the cheapest means of transmission is by a rope ¾ inch or 1 inch (a tow line) running over grooved pulleys 3 or 4 feet in diameter. The pulleys may be made of pine wood and clamped to the driving shaft and to the machine shaft. When not in use the rope can be taken off and stored safe from the weather.

(884) J. W. B. — Stains on a ceiling should be carefully scraped enough to take off the old whitewash, and washed with clean water before re-whitewashing. Then whitewash with good white lime water with a little white glue dissolved in the water. An ounce of glue to a pail of whitewash is sufficient.

(885) C. W. G. writes: I have a griddle which I clean every morning with sapolio and a scrubbing brush, rubbing 15 to 20 minutes. The face is full of small ridges left from the grindstone. What can I use that will give it a smooth face? A. Rub the metal with a piece of leather wet with flour of emery and water, and finish with ground pumice stone on a cloth.

(886) J. E. L. writes: Will you let us know of a simple method of preparing chloride of silver, and how the powdered form is changed into a solid that can be moulded? A. Dissolve silver coin in nitric acid, warm the solution, and add hydrochloric acid and filter. The solid matter is chloride of silver. The filtration should be done in a room as near dark as possible. Allow it to dry in the dark. When all moisture has evaporated, it can be melted at a low red heat and cast into any desired shape in a mould. The mould may be of various materials, iron, clay, or even pasteboard if the heat is kept low.

(887) F. S. M. asks: Would a plunge battery of four cells, with a capacity of 1½ quarts of fluid per cell, and with zincs and carbons 5×6 inches, furnish any more power to run a motor if changed into a battery of eight cells of half the size per cell? What is the best way of connecting up the cells to get the most power? A. The proper arrangement of the cells depends on the motor used. The four cells arranged in series should work an ordinary small motor very nicely. Do not divide the plates and produce the eight cell battery. Procure a low resistance (1 to 2 ohms) motor and use the larger cells.

(888) C. E. P. asks how and by what process I can extract aluminum from the clay. I am a miner, and we run off large quantities of clay, and I might at the same time save the aluminum with perhaps a small extra expense. A. Aluminum can be extracted from clay by the use of metallic sodium or by the electric furnace. There is no way practicable for you, as it is an expensive and difficult operation and only available for experienced chemists. Richards on Aluminum gives details of processes; this we can supply for $2.50 by mail.

(889) R. M. P.—Ordinary house refrigerators use about 200 pounds of ice per week more or less. The drainage is through a half inch pipe sealed. For a ten or twenty thousand pound refrigerator a 2 inch pipe with seal is large enough. There is nothing suitable for the inside of refrigerators but metal, which may be zinc or galvanized iron, of which a deflector and drip trough may be made to catch the water of condensation falling from the bottom of the ice chamber.

(890) W. D. M.—The force of the tidal motion on the flow and ebb are contrary and balance each other. There is no known change in the earth's rotation from tidal causes.

(891) F. McF. — Violin varnish: Dissolve 12 parts sandarac, 6 parts shellac, 6 parts mastic, 3 parts elemi gum, in 150 parts alcohol. Warm when dissolved and add 6 parts Venice turpentine. Color to match the old varnish with Brazil wood and dragon's blood gum.

(892) H. M. writes: In forcing water through a hose will the pressure be the same at the discharge end as at the pump end? A. The pressure will not be as much at the discharge end of the hose as at the pump. The motion of the water through the hose causes friction, which retards the flow. When the end of the hose is closed, and with no movement of the water, the pressure is alike at both ends on the same level.

(893) O. A. P.—For a colorless lacquer dissolve bleached shellac in pure alcohol, settle and decant. Make the lacquer very thin. The usual lacquer for brass is made with ordinary shellac and alcohol made very thin, settled and decanted.

(894) E. D. asks: Will men peddling ink stands on commission have to pay a city or borough license or tax? A. Many towns or counties require peddlers to take out license. In some States, a State license is enforced, though this has been the subject of many suits, and has been declared unconstitutional except as a police regulation enforced alike upon citizens of the same and other States.

(895) F. R. asks the ingredients used, and in what proportion, in making hard oil finish. A. Hard linseed oil varnish is made with 750 parts linseed oil boiled with 150 parts litharge and 90 parts pulverized minium. Boil until it turns brown, then add 500 parts pulverized amber melted in 60 parts linseed oil. Boil and stir for a few minutes, cool, settle, and decant the clear varnish.

(896) J. H. A. asks: What is the composition of the skin colored material which dentists use in making artificial teeth? A. Pink celluloid or xylonite. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 227.

(897) J. B. S.—The height of the atmosphere is supposed to be about 50 miles. It is not positively known. The highest point jet attained by a balloon is about 5 miles. The thinnest sheet copper that is made is about 0·007 inch thick (33 wire gauge) and weighs 2·88 pounds to a square yard. Its breaking strain is about 21lb pounds to one inch width.

(898) F. G. D.—Steel springs are tempered in oil and reheated with oil on the surface until the oil blazes, then cool in oil. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 20, "How to Make and Temper Springs."

(899) A. P. asks: Is it possible to hatch 13 perfect chickens from 11 eggs? A. Yes. Twin chicks are occasionally brought out. They generally die young.

(900) J. A. S. asks whether there is any chemical known that can disguise the smell of kerosene and not impair its action as a washing agent in the boiling of clothes. A. No such agent is known. Kerosene can be subjected to additional purification with bichromate of potash and sulphuric acid.

(901) C. T. E. writes: 1. I spilled some kind of chemical upon some cloth goods (probably sulphuric acid) which left a vermilion stain. I applied some India ink and succeeded in removing the red color, but left a shiny spot which showed through the ink, the chemical leaving a glaze. Is there anything I could use to remove the greasy-looking glaze so produced? A. Wash the spot with ammonia and water. 2. What will bleach out an ordinary finished photograph, leaving ink lines which have been drawn over the picture? What is a silver print? A. Solution of mercuric chloride (corrosive sublimate).

(902) C. G. asks: 1. Is black a color? If it is not, how is it proved? A. Black is the absence of colors. This is evident, because when light, the source of all colors, is withdrawn, the eye is affected by blackness. See SCIENTIFIC AMERICAN, vol. 56, p. 137. 2. Is there anything that if you put it on your bait while fishing, will draw the fish? If so, what is it? A. We know of nothing that has any real value for this purpose. 3. What is smallage? A. A name for celery (*Apium graveolens*).

(903) H. J. S. asks (1) how to make a liquid that will oxidize silver a glossy black by dipping small silver articles in the liquid. A. Use a solution of sulphide of potassium; polish metal before, and rub with a soft rag or chamois after immersion. 2. How to make a liquid that will oxidize copper or oroide by dipping, to imitate bronze? A. Use the same bath, but have it quite dilute. If for outside work simply oil with olive oil, and let the weather do the rest.

(904) M. H. & Co. ask for a recipe for making artificial cider. A. We give two formulas: *a*. 25 gallons soft water, 2 pounds tartaric acid, 25 pounds dark brown sugar, 1 pint yeast. Put in a clean cask with the bung out, and after 24 hours stir them well together. Add 3 gallons spirits, bung up the cask, and leave for 48 hours. *b*. Water 100 gallons, honey 5 gallons, powdered catechu 3 ounces, alum 5 ounces, yeast 2 pints. Ferment for 15 days in a warm place, in sun if possible, then add bitter almonds ½ pound, cloves ½ pound, burned sugar 2 pounds, whisky 3 gallons. If too sharp add honey or sugar, if too sweet add tartaric acid.

(905) H. P. B. asks (1) whether Portland cement or plaster of Paris would not do (for light work) in making the gas furnace described in SCIENTIFIC AMERICAN of May 4, 1889, page 279. A. Nothing is a good substitute; try to get pipe clay at the drug store; try mixing wood or coal ashes and sand with as little Portland cement as will hold it together. 2. Which of the previously named substances would give the best result, as clay is not available? A. Of the two, Portland cement is the best and may answer for low heats.

(906) J. B. O.—The powder sent may be a natural deposit of infusorial silica. Use powdered pumice stone as a polishing and cleaning agent and you will get probably equal satisfaction.

(907) Theo asks what to use to remove tan or sunburn. A. The following is recommended: 6 drachms avds. powdered borax; Price's glycerine ¾ ounce; use water or elder flower water 12 ounces; mix. We doubt the efficacy of any application except such as will cause the outer layer of the skin to strip off, such as the extract of cashew nuts. Even such a violent application does little good if the skin is re-exposed to the sun, as sunburn and freckles are liable to return as badly as ever.

(908) S. D. M. J. Co. writes: Please give us in your Notes and Queries a recipe to strip nickel off nickel plated goods. A. Use strong sulphuric acid 4 pounds, nitric acid 1 pound, water 1 pint. The mixture must be made gradually, adding the sulphuric acid first to the water, and adding the nitric acid after it is cool. The articles must be carefully watched and must be removed from the bath the instant the nickeling is stripped.

(909) S. K. A. writes: A certain writer says: "We were in a kind of chrysalitic condition." He refers to the state of a chrysalis. 1. Is his use of the word chrysalitic proper or sanctionable? A. We should be inclined to admit the word and the use made of it as allowable. "Chrysalid" is given by Webster as the adjective. 2. In good usage, is it proper for a compositor to divide the word Worcester at the end of a line, Wor-, carrying the balance of the word over to next line, as though it were a three-syllable word? A. Yes. 3. Can you refer me to any standard authority, in book form, on correct punctuation and the best usage of the English language, that would be an aid to compositors? A. We refer you to Hill's Manual of Social and Business Forms, $6; also Roget's Thesaurus of English Words and Phrases, $2.50, which we can send by mail.

(910) F. W. asks: In SCIENTIFIC AMERICAN, May 18, page 314, No. 799, you state how to preserve wood; would the sulphate of iron do for shingles? I have to lay about 50,000 hemlock this year. I think the tar would be too dangerous? A. We should not feel inclined to recommend iron sulphate, as repeated rainfalls would tend to wash it out. For shingles something more insoluble would seem better.

(911) J. B. asks: 1. How much pressure will mercury exert in a tube ⅛ inch diameter and 10 inches long, through expansion? A. There is hardly any limit assignable. As the heat increases the pressure will increase until it would burst almost any tube that did not expand as rapidly as itself. Thus for a change of temperature of 10° F. in a non-expanding vessel, mercury would exert a pressure of 2,850 lb. to the square inch. But as the containing vessel would expand with the heat, the absolute pressure would be somewhat less, but still very great. 2. Is there any solid that becomes heavier by immersion in water? A. No. 3. What would be the cost of the magnet described in SCIENTIFIC AMERICAN of May 11, 1889? A. About twenty-five dollars if you do some of the work yourself. 4. Is there any electric motor that is suitable for running sewing machines, and about what would they cost? A. For such a motor, see our SUPPLEMENT, No. 641, which we can send by mail for 10 cents.

(912) H. W. S. writes: 1. In case of a knot falling out of a board in a fence, is it caused by the board drying and shrinking away from the knot, or the knot drying and shrinking away from the board? A. We believe it is due principally to shrinkage of the knot. 2. If a hole was bored in a dry board, when the board became water-soaked, would the hole become smaller or larger in diameter? A. The hole in the wet board we should expect to find larger than when the board was dry.

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