Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) A. A. R. asks if either gun or powder is injured by leaving the gun loaded, the gun being the ordinary iron barrel. A. If the gun is not perfectly clean (freed from the remains of burnt powder) and well oiled it is not well to leave the charge in any length of time. 2. I want a simple test for cistern water to tell whether or not there is sewer poison in it. A. Dissolve in a pint of distilled water half an ounce of pure tannic acid and filter the solution through filter paper into a clean bottle. Dissolve in another pint of distilled water a quarter of an ounce of pure permanganate of potash, and filter into a clean bottle as before. Draw off two separate pints of the well water in clean clear glass bottles; add to one about two fluid ounces of the tannin solution, put a new stopper in the bottle, and set it aside for forty-eight hours. To the other sample add a few drops of the permanganate solution (just enough to impart a distinct pink tinge), and note the color fade out at once or on standing half an hour. Add to another sample of the cistern water a few drops of a filtered solution of a quarter of an ounce of pure nitrate of silver in a gill of distilled water, and note whether a white precipitate or an opalescent cloudiness forms immediately or on standing half an hour in the dark. If an appreciable quantity of sewage is present in the water the tannin will occasion a flocculent or curdy precipitate, at first a mere cloud, which finally settles to the bottom as a distinct precipitate. In the permanganate test the color imparted will soon fade out if it does not do so at once. The white precipitate or cloud forming on the addition of silver nitrate also indicates the presence of contaminating substances, especially if the other tests are positive. If the tannin and permanganate reactions indicated are marked the water is unfit for potable purposes.

(2) F. B. asks: How can I keep a tent made of thin cotton cloth from mildewing without coloring the cloth? A. Saturate the cloth first with a solution of soap and then with a strong aqueous solution of lead acetate or alum. Let it partially dry, then rinse with clean water.

(3) A. V. R. asks: Can you tell me of glue to use for cigarettes? I have used flour paste, but it is not quick enough. The glue must not discolor the paper, and when dry must not show. Could you inform me what is used by the manufacturers of cigarettes? A. Thick starch paste free from lumps and containing a trace of clove oil to keep it sweet answers admirably.

(4) H. C. F. asks for a receipt for packing eggs in summer to keep for winter. A. Dip the eggs in a solution of 2 oz. gum arabic in a pint of cold water, let them dry and pack in powdered well burned charcoal.

(5) C. H. H. asks how to make potash water glass? A. Potash waterglass is prepared by intimately mixing two parts, by weight, of pure white silicious sand or clear quartz, and six parts of anhydrous carbonate of potash, all ground to a very fine powder, and melting the mixture in a large clay crucible at a bright red heat. Carbonic acid gas is given off rapidly, and as soon as this ceases and the mass is in a state of calm fusion it is poured out on an iron plate to cool. This glass dissolves readily in boiling water, and on cooling the solution a sirupy liquid is obtained. This is the potash water-glass referred to.

(6) C. J. H. asks (1) how aniline is prepared and shaped which is used with the indelible writing pencils. A. A mixture of chalk and kaolin is made into a stiff paste with a strong aqueous solution of aniline violet (or other soluble aniline dye) containing a little gum dextrine, pressed into shape and slowly dried. 2. How to make brass, such as is used for cheap rings and sleeve buttons, that will keep its luster and not make the fingers and cuffs black? A. We know of no practical way. 3. How celluloid is prepared and put on linen such as is used for waterproof collars and cuffs? A. Celluloid is composed of nitrocellulose or soluble cotton combined with camphor by means of strong pressure and heat, under which conditions it is quite plastic.

(7) A. K. asks: 1. Does water ever get too cold to freeze? If so, under what circumstances does it pass the freezing point without congealing? A. At a temperature of about 32° Fah. pure water congeals under all circumstances. 2. Is the sugar that is in the maple sap taken from the ground, or is it manufactured from the material taken from the ground by the organs of the tree? A. A portion of the substances of which maple sugar is composed is derived from the soil, and a larger port on from the air. The sap is formed by chemical reactions within the tree. 3. Will evaporation be more rapid if a lid be placed over vessel while boiling? A. No; the contrary.

(8) J. D. S. asks how to make brick burn a dark color. I have been using coal dust, which does not prove satisfactory. I have an amount of fire clay among the clay, which, when moulded, burns a very light color. A. Spray the clay while mixing with a small quantity of a solution of 1 lb. common green copperas in 4 gallons of water. Or use as a cheap substitute for this, ordinary acetate of iron liquor.

(9) J. S. H. writes: I have a large marble slab, with two large hair oil stains on same. What can I use to take out the oil or to make it all oil? Have tried several oils but with no effect? It has been on for six years, and has soaked through. What is a cheap way to fix it? A. Make dry slaked lime into a paste with one ounce of washing soda dissolved in half a pint of hot water. Rub this into the spots and let it remain on over night. Then wash off with clean water. Repeat if necessary.

(10) C. W. K. asks how to remove common black ink from parchment. A. Moisten the spots first with a strong solution of oxalic acid, then with a clear saturated aqueous solution of fresh chloride of lime (bleaching). Absorb excess of the liquids from the paper as quickly as possible, with a clean piece of blotting paper. Repeat the treatment if necessary, and dry thoroughly between blotting pads under pressure.

(11) C. L. asks: Can you tell me how to dissolve rubber so as to make rubber stamps? A. The rubber is not dissolved. See "How to Make Rubber Stamps," SUPPLEMENT, No. 83.

(12) H. E. writes: I have some receipts for making colored fires; among them are some articles termed meal powder and Chertier's copper. What are these substances? A. The first is gunpowder reduced to a fine flour; the second, fine copper filings made into a paste with an equal weight of finely powdered potassium chlorate and enough hot water, then thoroughly dried.

(13) W. W. asks about what steam pressure a mercury flask will stand. Will it be safe to put 40 to 50 lb. pressure in them? A. It will be safe at three times 40 or 50 lb.

(14) "Subscriber" asks: What would be the cheapest and best style to make a boiler for an engine 1½ inch cylinder, 3 inch stroke; whether upright or horizontal, and of what material? Also, would oil lamp or lamps give out sufficient heat, and what part of a horse would the above be? A. A vertical tubular boiler of iron. Petroleum or kerosene lamps might be arranged to heat it. Engine would be half horse power to one horse power, according to steam pressure and velocity at which it is run; 2 inches by 4 inches cylinder would be about double the power.

(15) C. E. T. asks: Is there any difference between the power required to punch a hole in iron one inch in diameter and one inch thick, and the power required to punch a hole two inches in diameter and one-half inch thick? A. According to the result of experiments, the power required for punching iron plates is directly as the area of the boundary of the hole, or as the circumference multiplied by the thickness.

(16) J. D. S. writes: My engineer and I are in dispute on the following points, and appeal to you for an opinion. We wish to draw water from a stream to the sugar house, four hundred yards distant. Have a Blake pump, and will use a three-inch iron pipe for the suction. From the level of the water to the pump is 20 feet perpendicular. From the level of the water to the top of bank, near the stream, is 22 feet. Now, will it be better to lay the pipe with a gradual fall throughout, from the pump to the water, or to make a perpendicular lift at the stream which will carry it over the bank, and then fall gradually back toward the pump, which is two feet lower than the top of the bank near the stream? My engineer says it should be put with the fall from pump to water, and use thin check valves in the length of the pipe. I hold the contrary opinion, and especially that more than one check valve is worse than useless, as it is only an additional weight for the pump to lift. He insists that he can, by laying a pipe as he says, and with several check valves, make a pump raise water forty feet perpendicularly with ease. A. If the pipe is tight, it makes little difference which plan is adopted. Your engineer is "all wrong" in saying that he can lift the water 40 feet by using a number of check valves. A multiplicity of check valves increases the difficulty.

(17) J. R. D. asks: 1. What is the best lubricant for two wood surfaces? A. Pure refined tallow or lard, with a little black lead. 2. What is the formula for finding the theoretical horse power of a given head of water? A. One horse power is 33,000 lb. lifted 1 foot high per minute. For water power multiply the weight of water falling over the dam per minute by the amount of fall and divide by 33,000, the result is the theoretical horse power. When applied to water wheels the net power is from 60 to 80 per cent, according to the kind and perfection of the wheel.

(18) G. E. asks: How can I make the so-called liquid slating for blackboards? A. Shellac, 1 lb; borax, 4 lb.; water, 4½ gallons. Heat the water to boiling, add the borax, and when this is dissolved gradually add the borax, and continue the boiling until the latter is dissolved; then introduce lampblack, 2 oz.; silicate of soda (a sirupy solution), 8 oz.; fine silica, 1½ lb. Stir well together and add enough hot water to reduce it to the proper consistence for use.

(19) S. C. D. asks if brass pipe for conducting water for domestic use would be safe; would water so conducted and at times standing in brass conducting pipes, be perfectly free from any poisonous or injurious properties, and positively safe to use? A. Brass is not a proper material for pipes conveying potable water. Water that has remained in such pipes for any length of time is not fit to drink or for cooking. Use iron or wood pipes.

(20) M. R. P. writes: I am painting with oil colors on gold and silver leaf. To preserve the brightness of the painting some kind of varnish is necessary. What kind can I use so as not to damage the gold or silver leaf? A. Photographer's clear plain collodion answers very well.

(21) W. H. B. asks: Is there anything that will neutralize the oxide of iron in glass sand, which in melting renders the glass dark colored and full of sand or small blisters? A. The introduction of a little oxide of manganese will improve though it will not eradicate the color. Fine glass cannot be made from such sand.

(22) G. M. P. asks: What is the proportion of coal to the amount of glass melted in the manufacture of glass table ware? A. In the old method of melting glass it required 1½ pounds of coal to melt a pound of glass; in Germany, where coal is expensive, the glass manufacturers claim to be able to melt a pound of glass with a pound of coal. There are glass melting furnaces running successfully in Pittsburg, which melt seven pounds of white glass for table ware with one pound of coal.

(23) E. W. M. asks: What is the nutritive value of fish as food as compared with other articles of flesh diet? A. According to Professor Atwater: Taking medium beef at 100, we should have, as the nutritive value of like weights of fish free from bone: Medium beef, 100; fresh milk, 23·8; skimmed milk, 18·5; butter, 124; cheese, 155; hens' eggs, 72; codfish, fresh, 68; flounders, 65; halibut, 88; lake trout, 91; eels, 95; shad, 99; salmon, 104; salt mackerel, 110; dried codfish, 346.

(24) R. H. asks: Are there any coal mines successfully worked under the sea? A. A number of English coal mines are being worked under the ocean. In Northumberland the net available quantity of coal under the sea is estimated at 403,000,000 tons, and on the Durham coast under the sea, including a breadth of three and a half miles with an area of seventy-one square miles, 734,500,000 tons. The latter mine is in a vein of an aggregate thickness of thirty feet, distributed in six seams.

(25) T. A. W. asks how much lap there is on the steam and exhaust valves of the Corliss engine; also, if there is any way of setting the valves except to take off the cylinder heads. A. The lap is different in the different sizes of engines and engines running at different velocities. You can set the valves by having the position of the openings and the section of the valve marked at some proper place on the outside.

(26) W. L. asks why the screw propeller is used in preference to the paddlewheel for ocean navigation. A. Because: 1. The machinery weighs less and occupies less room than for paddlewheels. 2. Its propelling power is not so much affected by the varying draught of water. 3. Its propelling effect is not reduced in a sea way and by the rolling of the ship, as is the case with paddle wheels. 4. It is much less liable to damage from heavy seas.

(27) J. B. asks if an engine of the following dimensions is well proportioned: Cylinder 7x20, with a two-flue boiler. What is the horse power of such engine and what sized boiler is required? A. Your proportions are very good, unless you wish to run at a high velocity, then a shorter stroke will be better. The engine, will develop about 23 horse power at 120 revolutions per minute. Boiler 38 inches diameter by 22 feet long, 2 flues 12 inches diameter. Of the speed of the engine is less than 120, a smaller boiler will answer.

(28) W. E. F. L. asks: What is the cheapest way to magnetize small steel bars to saturation? The bars are from 2 to 3 oz. in weight. A. You will find full information on this subject on page 379 (36), SCIENTIFIC AMERICAN, for December 11, 1880, vol. xliii.