Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) W. C. H. writes: 1. About what is the air pressure on a window glass when the weather outside registers zero and temperature inside is at 100° Fah.? How hot would it require to be for outdoor air pressure to break common window glass, say 24 by 36 inches? A. The difference in pressure due to difference in weight of air at temperatures given would be slight. It would not be possible to make such difference great enough to break the glass, but the difference in tension on the glass from variations of temperature sometimes causes breakage with comparatively small changes in the weather. 2. How is prepared glue made? A. See answer to query 14 in SCIENTIFIC AMERICAN of February 26. 3. What does the small letter "M" on the silver dollar denote? A. It is the initial of a die cutter, Morgan, and is on but few coins. Other letters on coins are known as mint marks; they are not on all coins, and not on those from the Philadelphia mint, which does the largest proportion of the coinage. "O" is the mark of the New Orleans mint, "S" that of the San Francisco mint, "C C" that of Carson City, etc. 4. What is the difference in speed of the travel of a rifle ball and sound? A. Sound in air travels at the rate of about 1,000 feet a second, the speed varying considerably with the volume or loudness of the sound. The velocity with which a ball leaves the rifle will vary from 1,500 up to 2,200 feet per second, according to the charge of powder, weight and shape of projectile, etc.

(2) H. J. D. asks (1) what cement to use when joining carbons to top of jar in a bichromate battery, by means of brass plate, so the acid will not ruin it. A. You may fasten the carbon by brass lugs secured by bolts and nuts; before doing this, the upper end of the carbon may be soaked in melted paraffine. Or, you may copper-plate the top of the carbon after the immersion in paraffine, and then dip into melted type metal. This gives a good bearing surface for the lugs, or they may be soldered to it. 2. How to keep brass bright after polishing it? A. Lacquer it with some approved lacquer. 3. What is the best material for soldering brass? A. A solution of chloride of zinc made by dissolving zinc to saturation in muriatic acid is generally used. The addition of a little sal ammoniac improves this. Lactic acid is also used.

(3) L. S. asks: 1. In the induction coil described in No. 160 of the SUPPLEMENT, what is the object in having bare copper wire in the secondary coil, and will not insulated copper wire give as good results? A. Bare copper wire is used to save space. Otherwise, covered wire will answer just as well. 2. Will the length of the spark be increased if the coil be made 2 or 3 inches larger, and a larger amount of wire in the secondary coil be used? A. The larger the core, the longer will the sparks be. 3. If made larger, would not three layers of No. 16 wire be better than two layers for the primary? A. Three layers might be advantageous if the coil was larger. 4. Is the coil dangerous, using 10 or 12 small bichromate potash cells, and will the effects of the coil increase with the battery power? A. The danger of using too high a battery power is that the insulation will be injured, and its effects increased to a certain extent with increased battery. 5. Will common thick white wrapping paper do for between the tinfoil in the condenser? A. For the condenser, you should use light paraffined paper.

(4) R. A. writes: Say there are two cable street car companies, A and B, and A puts down his road first, then B wants to cross A's line, how is it done without inteference? A. A special device of two connected grips on a car, for this purpose, was illustrated in the SCIENTIFIC AMERICAN, vol. liii., No. 11.

(5) E. J. M.—Copper, brass, or iron moulds are used for casting the valves, seats, and stuffing boxes of dry gas meters. Oiling is not necessary. If oiled to prevent sticking, the oil should be very thinly put on with a brush. The composition is tin and antimony—5 parts tin, 3 parts antimony. Diaphragms should be as nearly alike as possible, and the dials made to match the measure.

(6) J. A. P., York Corner, Me., asks: 1. Is there any cement or other method for sticking rubber to brass? A. Fuse together equal parts of gutta percha and pitch. Use hot. 2. Will rubber freeze so as to break? A. Rubber when exposed to undue cold loses its property of elasticity, and becomes stiff. See "Characteristics of Rubber," in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, and 252.

(7) G. S., Ogdensburg, N. Y., asks (1) how to make percussion powder used in gun caps. A. 100 grains of fulminating mercury are triturated with a wooden muller, on marble, with 30 grains of water and 60 grains of gunpowder. This is sufficient for 400 caps. 2. A good flux for general soldering. A. Resin for tin, chloride of zinc and sal ammoniac for iron and brass.

(8) S. S. K. asks: 1. What is the enamel, and how is it baked, on bicycles? A. It is japan varnish made of gums and oil, and is baked in an oven heated to 260°. 2. What is the liquid enamel also used for bicycles, but just applied with a brush, cold? A. Air-drying black varnish—ordinary carriage varnish mixed with lampblack.

(9) M. N., Newark, N. J., asks: How can I remove warts? A. Moisten the warts, and rub sal ammoniac well on them every night and morning.

(10) L. G. G. asks: 1. Is alcohol explosive? If so, under what circumstances? A. Alcohol evaporates at a comparatively low heat, and gives off an inflammable vapor. This suddenly lighting sometimes produces a slight explosion; a mixture of this vapor and air is explosive. 2. Is there danger in using an alcohol lamp, and if so, under what circumstances? A. The danger in using an alcohol lamp is that the vapor of alcohol may inflame. A good fitting wick tube, and a low temperature in the body of the lamp, are the conditions of safety. 3. Is wine or grain alcohol more or less dangerous than wood alcohol? A. Wood alcohol evaporates at a lower temperature than ordinary alcohol, and hence is more dangerous. 4. Is wood alcohol as good to use in a lamp for soldering as grain alcohol? A. It is not as good, as it will give a less quantity of heat per gallon. 5. What are the objections, if any, to wood alcohol for such purposes? A. The very disagreeable odor and the greater danger are the objections. 6. What is the cost of grain alcohol, and what is the cost of wood alcohol? A. Grain alcohol, 95 per cent, $2.30 per gallon; wood alcohol, $1.25 per gallon. 7. What class of tradesmen sell wood alcohol? A. Dealers in chemicals, and also special houses.

(11) E. N. A. asks: Will you please answer in your paper whether the playing of a mouth instrument spoils the voice for singing? A. The question is still undecided. 2. Is wood engraving a good trade, and are there many in it? A. Wood engraving is a good trade, except that it is gradually being displaced by process work.

(12) F. A. B. asks if water has any more attraction than land for a bullet or stone being fired over it, and what that attraction is. A. Water has less attraction, owing to its lower specific gravity. The difference is very slight for existing conditions of land or sea.

(13) D. N. G. asks whether plaster of Paris will stand more heat than iron. A. Plaster of Paris, when set, will stand very little heat; far less than iron.

(14) D. A. writes: Will you please give me a good prescription, through your valuable issue, for a person who has lost considerable flesh and strength. I have no disease of any kind, but still I am very weak. A. Consult a physician. Try a good emulsion of cod liver oil if you can take it.

(15) H. G. H. asks: What is the difference between the British quart and the American quart? A quart of water in England weighs 20 ounces, I believe. What does it weigh here? A. The Imperial pint contains 34·659 cubic inches, its contents in distilled water weighing 8,750 grains. The American pint contains 28·8 cubic inches, weighing in distilled water 7,291⅔ grains. The Troy ounce contains 480 grains, the avoirdupois 437½. The Imperial pint contains 20, the American a little over 18 ounces, avoirdupois.

(16) B. M. asks: What is an arpent in dimensions? A. The arpent was an old measure for land. It had different values. An arpent by one standard was equal to five-sixths English acre.

(17) J. W. P. says: We are frequently troubled in our press room by paper sticking together, both in feeding and in straightening, which makes it difficult to handle. Will you please give cause for this peculiar phenomena, and remedy to prevent it? A. Your trouble is caused by electricity. If you print your paper dry, you might try wetting the edges of the paper with a sponge. If that does not remedy the difficulty, take a sheet of Manila paper, oil it thoroughly, and use it as an offset sheet.

(18) T. W. asks: 1. In an electro-magnet, what is the relation between its attractive force and the size of the coils? A. No clear statement of any law can be given, as so many other factors enter into the problem. 2. What size wire will give best results in an electric bell (local), and how large should coils be? A. You will find No. 20 or 24 wire will work well, ¼ to ½ pound in quantity. 3. What is the difference between an electric and a magneto-electric bell? A. There need be no difference.

(19) A. J. K. asks: 1. Please give me directions for making platinum prints, spoken of in some books on photography. A. Platinum prints are the subject of a patent. Address in reference thereto Wilson Hood & Co., 910 Arch Street, or Thomas H. McCollin, 635 Arch Street, Philadelphia. 2. How can I stain wood so as to make it look like cherry? A. Try following:

Alkanet root	15 grains.
Aloes	30 "
Dragon's blood powdered	30 "
95 per cent alcohol	500 "

Mix and let stand in a tightly corked bottle some days. Go over the wood with dilute (1 in 10) nitric acid first. This is pretty dark. You may lighten by using more alcohol. 3. What can I put on a laboratory table made of wood to prevent it from being stained and eaten by acids or alkalies? A. Try silicate or slate paint, such as sold for blackboards.

(20) L. W. writes: I noticed in a silver plating works some time since that the platers dip their wares in a solution to clean and take off the tarnish. They claim it is a solution of cyanide of potassium. Can you give me receipt for this solution, and how to clean the ware? A. A hot solution of cyanide of potassium is used as a dip for articles that have been a few minutes in the electro-plating bath. For full information as to the preliminary cleaning, scouring, pickling, and amalgamating of the articles, we refer you to Fontaine's Electrolysis, $3.50, also Watt's Electro-Metallurgy, price $5.00. These are the best books on the subject. One process is the following: A solution of 1 caustic soda in 10 water is first used; next 1 sulphuric acid in 10 water; after rinsing, a solution of 10 nitric acid (36°), 200 salt, and 200 water is used; next 60 nitric acid, 200 sulphuric, and 200 water. To amalgamate, a dilute solution of nitrate of mercury may be used. These solutions are for dips. The articles are immersed in them and rinsed off between the applications.

(21) F. H. M. writes: Will you please give the method of solving the following problem: A man has a board ten feet long, which is two feet wide at one end and from that tapers to a width of one foot at the opposite end. Where shall he cut it at right angles with the center line, to give an equal area in each section? A. The area of the whole piece is found by multiplying its mean diameter by its length: $\frac{1+2}{2}\times 10=15$ square feet. It is to be cut into two pieces, each of an area of 7½ square feet. Let us take the section at the smaller end. Its small end will be 1 foot across; call its length x. Then, as the board tapers in width one in ten, the large end of the section will measure $1+\frac{1}{10}x$. The mean width will be:

$$\frac{1+(1+\frac{1}{10}x)}{2}=1+\frac{1}{20}x.$$

This mean width multiplied by the length, x, will give the area, which by the conditions of the problem must be 7½. This gives us the equation:

$$(1)\ (1+\tfrac{1}{20}x)\,x=7{\cdot}5.$$

which solved gives us $x=5{\cdot}8110+$ or 5 feet 9·32 inches, or the board must be cut at that distance from the narrow end.

(22) N. S. C. writes asking (1) the rate of expansion or contraction of ice. A. 1000 volumes of ice at 32° Fah. contract to 997½ volumes at —4° Fah. Also see SUPPLEMENT, No. 574, for recent determinations. 2. Also for a cement for bisulphide of carbon prisms. A. For prisms use fish glue with a little glycerine.

(23) A. F. O. writes: Cooling water begins to expand at 39°, and continues to expand till frozen. Does the resulting ice continue to expand by further reduction in temperature? What are the relative volumes of ice at lower temperature? A. See answer to No. 22.

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