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 This is for our information, and not for publication.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) H. H. S. asks (1) some solvent for plaster of Paris which is in small flakes. A. A hot saturated solution of sodium hyposulphite will dissolve plaster of Paris. 2. Something that will dissolve gelatine containing chrome alum, which has set and hardened. A. Use the strong acids. 3. Is there anything that can be mixed with gelatine so that it will set, but not dry or harden? A. We know of nothing except possibly the addition of a large quantity of glycerine. 4. Is there any way to drill a cavity in an artificial tooth without using diamond dust? A. Use the ordinary drill such as dentists use, moistened with turpentine. 5. How do manufacturers of rubber articles get such a fine polish on them? A. They are polished with fine pumice and a stiff brush and finished with whiting and a soft brush or rotten stone and oil. 6. Is there any way that steel can be prepared so it will not rust, and keep a spring temper? A. There are some surface oxidizing processes, such as the Bowers & Barff, but they have not been generally adopted.

(2) B. C. M. desires recipe for stencil paints—black, red, green, and blue. A. Take shellac 2 ounces, borax 2 ounces, water 25 ounces, gum arabic 2 ounces, lamp black a sufficiency. Boil the borax and shellac in water till they are dissolved, and withdraw from the fire. When the solution has become cold, complete 25 ounces with water, and add lamp black enough to bring the preparation to a suitable consistence. When it is to be used with a stencil, it must be made thicker than when it is to be applied with a marking brush. The above gives a black ink; for red substitute Venetian red for lamp black; for blue, ultramarine; and for green, a mixture of ultramarine and chrome yellow.

(3) B. J. H. asks if there is any solution that can be put on a plate glass window to keep flies off. A. Any solution would hurt the appearance of the glass. An infusion of smartweed is partially successful in driving away flies, but its use must be continually repeated.

(4) C. C. H. asks: What is the fall in feet of the Mississippi River from its source to its mouth? A. Lake Itaska, where the riverrises, is 1,575 feet above sea level; the most of the fall is in the upper region; the slope of the high water surface from Cairo to the Gulf of Mexico is 322 feet.

(5) J. W. F. asks (1) how to make a good rosewood stain. A. Take alcohol 1 gallon, camwood 2 ounces, set them in a warm place twenty-four hours, then add extract of logwood 3 ounces, aquafortis 1 ounce; and when dissolved, it is ready for use. 2. A reliable walnut stain for furniture, mostly hardwood. A. Spirits of turpentine 1 gallon, pulverized asphaltum 2 pounds; dissolve in an iron kettle on a stove, stirring constantly. 3. A cheap polish to brighten hard oil-finished work after being rubbed. A. Gum shellac 1 ounce, gum arabic ½ ounce, gum copal ¼ ounce. Powder and sift through a piece of muslin; put them in a closely corked bottle with 1 pint alcohol, in a warm place, shaking every day till the gums are dissolved, then strain and bottle.

(6) C. G. C. asks why druggists use distilled water? Could they not use common water as well? A. So as to have it as pure as possible. Common water often contains slight quantities of iron, salt, lime, and other ingredients, which render its use undesirable where a pure chemical is needed.

(7) E. M. W. asks for a good cheap liquid shoe polish. A. Take of gum shellac ½ pound and alcohol 3 quarts. Dissolve, and add camphor 1½ ounces and lamp black 2 ounces.

(8) J. F. A.—See the article on "Canned Food" in SCIENTIFIC AMERICAN SUPPLEMENT, No. 499, also the article "How to Can Asparagus" in SCIENTIFIC AMERICAN SUPPLEMENT, No. 604.

(9) J. H., Jr., desires a receipt for sticking paper to zinc. A. Use starch paste with which a little Venice turpentine has been incorporated, or else use a dilute solution of white gelatine or isinglass.

(10) F. W. L. says: 1. What is the resistance of a 10 and 16 candle power standard Edison lamp and the E. M. F. generally used with each? A. Two standard 16 candle power lamps may be given, and also a standard 8 candle power with following constants:

16 A—70 volts	82	ohms	0·85	amperes.
16 B—32 "	15·4	"	2·08	"
8 B—35 "	41	"	0·85	"

10 candle power lamps are not catalogued. 2. What is the relative resistance between the armature and field of small shunt and series dynamos? Does it make any difference in the above question whether the armature is open or closed coil? If it does, how so? A. No relative resistance of field and armature for dynamos can be given, as it varies in the different makes. The open coil armature normally has the greatest resistance. For examples of both constructions see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 161 and 600. 3. What is the theoretical advantage of the condenser in an induction coil? A. When a circuit including a coil is broken an extra current is produced, which goes in the same direction as the main current. This to a certain extent in an induction coil defeats its action by delaying the full break of the current. By a condenser this extra current is caught and sent around the coil in the opposite direction to the main current, thus demagnetizing the coil, and improving instead of deteriorating the cut-off. 4. Why is resin used in preference to muriatic acid as a flux, for soldering electrical joints? A. Chloride of zinc flux to which we presume you allude, tends to corrode the wire, on which it is used. This action is not immediate, but slow, and will always occur to some extent unless the joint is cleaned with hot water and dried. Resin is not only non corrosive, but acts as a preventive. 5. Is there any rule by which you can tell the resistance and length of a given weight and gauge of cotton covered wire knowing the weight and gauge of bare wire? If possible, give rule for double covered as well as single covered. A. No rule can be given that would be practical as regards weight. Resistance is unaffected by the coating. 6. What book or SCIENTIFIC AMERICAN SUPPLEMENT gives practical directions for making the different forms of galvonometers and electrometers? A. For manual on this subject, we recommend Haskins' work on "The Galvonometer and its Uses." This we can send you for $1.50.

(11) C. F. D. says: I mail to your address a twig cut from my tree. Is the trouble scale louse, and if so, what is the most scientific and practical way to exterminate them? The tree is twenty feet high, and is literally covered. A. In the absence of Professor Riley Prof. L. O. Howard, of the division of entomology, to whom we referred the specimen, says: The insect upon the twig is a scale louse, and seems without doubt to be the commou peach Lecanium (*Lecanium persicæ*), although the twig is not that of any variety of peach with which I am acquainted. It seems to resemble a cherry, and we should be glad to receive further information upon this point from Mr. Diller. The remedy for this scale as well as for all others of the same family is to spray the trees, preferably in the spring of the year, with a dilute kerosene emulsion made according to the following formula:

Kerosene	2 gallons	=67 per cent.
Common soap or whale oil soap	½ pound	=33 per cent.
Water	1 gallon	

Heat the solution of soap and add it boiling hot to the kerosene. Churn the mixture by means of a force pump and spray nozzle for five or ten minutes. The emulsion, if perfect, forms a cream, which thickens on cooling, and should adhere without oiliness to the surface of glass. Dilute before using, 1 part of the emulsion with 9 parts of cold water. The above formula gives 3 gallons of emulsion and makes when diluted 30 gallons of wash.

(12) C. I. M. asks: 1. What size and amount of cotton covered copper wire shall I use to make the strongest electro magnet; core of ⅝ inch soft; now using 1 cell (gallon) of blue vitriol battery? A. You should wind your magnet to about four ohm's resistance with as heavy wire as possible. Probably No. 18 will be a convenient size, using three pounds for both legs. 2. Will it make any difference if I use iron washers to hold wire on core instead of hard rubber washers? A. Iron washers will make little or no difference. You must have the ends of the legs finished to a true plane. 3. What kind of battery is best to get strongest magnetic force? A. A bichromate plunge battery is about the best for exhibiting electro magnets. The gravity batteries are of too high resistance and too low electro motive force.

(13) W. H. C. asks (1) what effect steam will have on coiled solid rubber. A. It disintegrates or rots it by a few months' use, according to the pressure or temperature of the steam. 2. Will steam draw the temper from thin tempered steel? A. It will in time, if the pressure or temperature is high, say a hundred pounds or more.

(14) D. S. W. asks: What proportions of camphor, niter, alcohol, sal ammoniac, and water used in making the chemical storm glass? A. Dissolve in alcohol 2 parts camphor, 1 part nitrate of potash and 1 part sal ammoniac. Then add water drop by drop until the mixture begins to grow a little cloudy. The solution is then ready for introduction into the tube. Another formula is the following: Dissolve 2½ drachms camphor in 11 fluid drachms of alcohol. Dissolve 38 grains of nitrate of potash and 38 grains of sal ammoniac in 9 fluid drachms of water, mix the solutions.

(15) C. D. asks the amount of curvature in one mile of ocean surface. A. $2\frac{1}{165}$ inches.

(16) E. T. H. asks (1) how to make a powder which, when added to water, will form an agreeable lemonade. A. Take 1 pound finely powdered loaf sugar, 1 ounce tartaric or citric acid, and 20 drops essence of lemon. Mix and keep dry. Two or three teaspoonfuls of this stirred briskly in a tumbler of water will make a pleasant lemonade. The addition of 1 ounce of carbonate of soda to the above renders it effervescent. 2. A silicate varnish for paper which will render it erasable for lead pencils. A. Such varnish is a secret preparation.

(17) C. F.—Galvanized iron pipe is largely used for water supply to houses. It is not more dangerous than lead pipe, but both should have their contained water discharged after standing a few hours Plain iron pipe also shows rusty water, after water has remained in pipe a few hours, and is also liable to fill up with rust nodules in two or three years, if the pipe is small, say ¾ inch or less.

(18) T. M. S. asks (1) the process of cleaning brass gun shells. A. For such as have been used, boil in a strong solution of caustic soda, rinse in hot water, then dip in a hot pickle of sulphuric acid 1 part, water 4 parts, and rinse in hot water. 2. The process of polishing tool handles. A. Polish by rubbing with turnings or with the end of a piece of wood while in the lathe, or, in quantities, by tumbling with turnings. A splint brush revolving very fast is sometimes used for polishing single articles.

(19) W. C. I. asks: What would be the difference in sustaining power, or crushing weight, between two cast iron columns each 10 feet high and 6 inches diameter, one made solid, the other cast hollow, the shell being 1 inch thick? A. The crushing value of the solid column is two and a half times greater than the hollow column as stated.

(20) C. E. M. asks the size and form of bellows used in hand organs. A. They are about 10 inches wide, 20 inches long, and are hinged at one end and double like a forge bellows.

(21) M. S. G.—There is no truer or better means of finding the actual horse power of an engine than by taking indicator cards of both strokes and ascertaining by them the mean engine pressure. This, multiplied by the speed of the piston in feet per minute, dividing the product by 33,000, gives the accepted horse power. Otherwise the area of the piston is multiplied by the boiler pressure, less the assumed coefficient by expansion and loss of pressure from boiler to engine, in place of the mean engine pressure by card. The coefficients computed for various degrees of cut-off may be found in the "Engineer's Handy Book," Roper, which we can mail for $3.50.

(22) J. C. M. asks how to get a fine polish on such stones as quartz, granite, etc., to use them as specimens in a cabinet. A. Grind the required surface on a grindstone. Let the last grinding be very light. Then rub with ground pumice stone and water on an end piece of wood, or a piece of sole leather. until a partial polish is obtained. Finish on a piece of sole leather, with oxide of tin or rouge, wet.

(23) G. N. W. asks for a recipe for a good black stamping ink for tracing cloth, one that will not rub off, for rubber or metal stamps. A. Try the following: Dilute 1 part of coal tar with 1 part of benzine, and stir into it one-tenth part of lampblack. Mix into a homogeneous paste, which is then ready for use. By adding more or less benzine it can be given any consistency desired.

(24) C. H. T. asks the easiest way to make holes through an oyster or clam shell. A. Drill the holes with a hard, sharp steel drill, the same as used for drilling iron. Use the drill dry.

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August 16, 1887,

AND EACH BEARING THAT DATE.

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