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 This is for our information, and not for publication.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) If X and S., "readers for many years," will send their address, we will mail them an answer. Their question is not of sufficient general interest to take up room with here. Inquirers should read the notice at heading of this department.

(2) W. A. C. writes: In scaling saw logs by Doyle and Scribner's rule, should we allow half inches in measuring or should inches be counted, and not fractions of an inch? A. Use inches only in the register; when measuring, take the nearest whole number.

(3) W. K.—Your 1 pound of mercury will occupy a length of 2·564 inches in a 1 inch tube, and will expand, from zero to 90°, $\frac{1}{1000}$ of an inch, or decimally 0·01923 inch.

(4) G. E. A. writes: I have made soldering iron of copper, which I cast in a mould. Now, when I want to hammer the copper into a point, it breaks off, whether cold or hot. 1. Can you tell me a remedy for it, so I can hammer it? A. Good copper can be hammered at a red heat; probably you have not pure copper. Better cast the point on. 2. What is an electrode? A. Electrodes are the poles of the electric circuit.

(5) H. W. S.—There are records of rainfall in the United States in a few places for 50 or 60 years past. The early records are not strictly reliable. The whole record shows variations of rainfall through decades of years, but not equalized, nor corresponding with any astronomical cycles. The reliable time of observation has not yet disclosed a secular decrease of rain for the United States, although in special localities such may be apparent.

(6) P. D. P. writes: Our boiler feed pipe and heater pipes are partly filled with hard lime scale, and will not work. How can we clean them? Have tried burning, but could not loosen scale. We keep boiler clean by using zinc scraps. A. We know of nothing cheaper than to renew the pipe if required at once. Filling the pipe with a solution of hydrochloric acid 1 part to water 6 parts will soon dissolve the lime, when it can be washed out. Not knowing what your incrustation is, whether carbonate of lime, sulphate of lime, or their mixtures with alumina from your clay beds, we are at a loss to say exactly what you require, but would recommend you to try to purify the feed water by filtration, by acid and soda treatment in a large tank, and settling, or heating the water in the tank by a coil, using the exhaust steam, or otherwise changing your boiler cleaning method from zinc scrap in the boiler to caustic soda in the feed water, about a quarter of a pound to a hogshead of water twice a week, and clean out boiler thoroughly of sediment once a month, or oftener if required.

(7) S. H. R. asks (1) if there are any acids or any compounds with acids that he can use to cut or eat through plate iron an eighth of an inch thick. If so, how to use same and with what results, the time it takes, etc.? A. Use nitro-hydrochloric acid equal parts, with fresh renewals every half hour. You may get through an eighth inch of iron in 5 or 6 hours. 2. The best book for information on the production and working of iron and metals. A. We recommend as the best book Osborn's Metallurgy of Iron and Steel (American practice), with large plates and illustrations, 8vo, $25. A cheaper work by "Greenwood," on the practice and theory of manufacture of iron and steel, $2. A general work comprising the manufacture and working in metals and alloys, by Byrne, "The Practical Metal Worker's Assistant," $7. All or any of which we can furnish.

(8) G. S. writes: Is there a formula by which to determine the temperature of water in a boiler generating steam under any pressure, say from 1 to 200 pounds per square inch? A. The formulas for determining temperature and pressure of water and steamas in a boiler under pressure are derived from the experiments of Regnault and others, and are tabulated in engineering works. For full explanations and tables see Haswell's Engineer's Pocket Book, $4.50, which we can furnish.

(9) B. M. G. and others.—A full illustrated description of the cable grip in use on the New York and Brooklyn Bridge, and the mechanism for operating it, was printed in the SCIENTIFIC AMERICAN of October 13, 1883.

(10) L. S. asks how modeling wax is made, such as sculptors sometimes use for modeling very small figures, etc. It is made of white wax melted and mixed with lard to make it workable. In working it, the tools used, the board or stone, are moistened with water, to prevent its adhering; it may be colored to any desirable tint with a dry color.

(11) W. W. asks how to varnish chromos. A. Take equal quantities of linseed oil and oil of turpentine, thicken by exposure to the sun and air until it becomes resinous and half evaporated, then add a portion of melted beeswax. Varnishing pictures should always be performed in fair weather, and out of any current of cold or damp air.

(12) C. B. asks what will take machine oil spots out of plain colored wall paper. A. Oil stains may be removed from paper by applying pipe clay powdered and mixed with water to the thickness of cream; leave on for four hours.

(13) E. G. P. asks what is used to kill the odor of benzine. A. Shake repeatedly with plumbate of soda, made by dissolving oxide of lead in caustic soda, and rectify. Simply shaking with charcoal and filtering will partially remove the odor.

(14) J. S. asks about the preparation of quicksilver for making mirrors, and the mode of applying same to the glass. A. The essential features of the process are the coating of the glass with tin foil, and then pouring quicksilver or mercury on the tin, thereby forming an amalgam which adheres to the glass. The exact method is given in Spons' Workshop Receipts, 1st series, which we can send for $2.00. The remuneration for such work is not high, and the wages are similar to those received by an ordinary mechanic.

(15) W. H. B. asks: 1. How much less is obtained by assaying copper by the dry method than by the wet? A. The fire assay of copper is by no means accurate, while the wet method of separation by the battery is very exact. 2. What is the difference between control assays and that of ordinary assays? A. Control assays are methods used to corroborate results obtained by other processes.

(16) A. P. S. asks for (1) a good solvent for nicotine. A. Nicotine is soluble in water, alcohol, and ether. 2. Several common roots, like the carrot, that will sprout or blossom when hollowed, hung up indoors, and filled with water. A. The sweet potato is said to be very beautiful when used as described by you. Wet sponges filled with seed are likewise commonly seen.

(17) W. J. H. writes: 1. A clock has twelve hands, and at twelve o'clock are all started together from the same point. The first hand makes a tour of the dial in one hour, the next in two hours, next in three hours, etc.; how long will it take all the hands to meet at their starting point? A. 27,720 hours, that number being the least common multiple of all the terms from 1 to 12. The 12 hour revolution hand goes around 2,310 times; the 11 hour hand, 2,520 times; the 9 hour hand, 3,080 times, etc. 2. I desire a recipe for making an indelible ink that I can use with an ordinary rubber stamp. A. See the recipe given for an indelible stamping ink, published on age 19 of SCIENTIFIC AMERICAN for July 11, 1885.

(18) J. N. writes: During an argument to-day, one of the parties asserted that a ton of wood and a ton of iron placed in a vacuum, the wood would weigh more than the iron. State if such is the case, and if so, why so? A. The wood would be the heavier on account of its larger volume of air. Its bulk would represent a cubic foot of air at 60° Fah., weighing 536·96 grains.

(19) C. I. asks (1) what kind of wood is best for ebonizing. A. Cherry is most used, but apple, pear, and hazel woods are also suitable. 2. Please give best receipt for ebonizing. A. See answer to query 11, given in SCIENTIFIC AMERICAN for July 11, 1885. Spons' Workshop Receipts, 2d series, devotes several pages to the subject. We can send it for $2.

(20) C. E. T. asks about a cemented cistern, the water from which tastes badly, probably the cement has an excess of magnesia. A thick wash of pure Portland cement will probably correct the strong taste. If not, a coat of paraffine put on the surface and melted in with hot iron will make the cistern odorless.

(21) F. F. Z.—The holes in material on which porous plasters are made are punched in a machine that makes a whole row at once, moving the cloth along by a ratchet. The machines are not on sale. Tracing cloth is thin muslin sized with isinglass and passed through polished rolls heated by steam. Tracing paper is either sized with isinglass and calendered, or oiled with linseed oil. Silver ink is composed of 1 part white gum arabic, 4 parts distilled water, 1 part silicate of soda in solution. Triturate with the best silver bronze powder sufficient to give the solution the required brilliancy. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, for gold and silver inks. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 249, how to make luminous paint.

(22) M. A. P.—See list of ink erasing materials given in the article on "Inks," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 157.

(23) J. M. F.—Experts examine the inks of writings by comparative means. See "Detection of Inks," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 255. The condition of the paper under the microscope and different qualities of ink on the paper are noted, but the age is difficult to determine. Old ink is not as easily removed from the paper as that more recently written with.

(24) J. E. M. asks about producing sulphate of zinc. A. The most convenient method is by dissolving metallic zinc in sulphuric acid (dilute). It can be commercially produced by roasting the mineral sulphide in the air.

(25) N. C. R.—The wood mouldings for picture frames are cut in a machine, brushed over with the plaster of Paris, and smoothed down with a steel trowel of the same form as the moulding. The plaster has a little glue mixed with it. For your blackboard to use with chalk use shellac varnish, lampblack, and powdered pumice; mix as a paint and brush over quickly. For your artificial slate, use shellac varnish, lampblack, and finest flour of emery. Thin the shellac varnish with 95 per cent alcohol, so that the emery will have a cutting surface. The exact proportions you must find by trial.

(26) J. B. writes: I would like to know the composition of red and white liquids in the little tubes in storm glasses. A. 1. The red consists of alcohol slightly colored with a little aniline or logwood. 2. The white is composed of:

Camphor	2½ drachms.
Alcohol	11 "
Water	9 "
Saltpeter	36 "
Sal ammoniac	36 "

Dissolve the camphor in the alcohol and the salts in the water, and mix the solutions together.

(27) C. writes: I have a plaster Venus de Milo, which has been painted white. I do not know if lead or zinc white. It has begun to peel, and looks as if it had had the small pox. How can I remove the paint that still sticks, preparatory to repainting? A. Take a hot solution of washing soda in the proportion of 3 pounds of the soda to a gallon of water. This mixture will readily soften the paint, so that it can be removed by simply scrubbing with a stiff brush.

(28) C. K. asks how to remove candle grease from furniture without injuring the varnish. A. Rub it off with a little warm water and a rag.

(29) G. K. desires a receipt for making antique brass. A. Dissolve 1 ounce sal ammoniac, 3 ounces cream of tartar, and 6 ounces common salt in 1 pint hot water; then add 2 ounces nitrate of copper, dissolved in a half pint water; mix well, and apply it repeatedly to the article by means of a brush.

(30) C. W. F. asks: 1. What is the ore found between lumps of soft coal? A. Probably pyrite, or iron sulphide. 2. How near completion is the statue of Liberty? A. The pedestal, it is said, will be completed in May. It is uncertain when the statue will be in place.

(31) D. M. R. writes: I have a one-half horse power engine; how large a boat would it run with stern paddle wheel, said boat to be very light and of good model? A. A boat 25 to 30 feet long, depending upon the size of boiler, pressure, and speed of engine. With all these large, a 35 foot boat will be appropriate.

(32) L. D. H.—As air weighs 0·076 pound per cubic foot, your cylinder of 10 cubic feet and 100 pounds weight would weigh 99·24 pounds without air inside.

(33) H. H. L. writes: We have an 80 horse power automatic cut-off engine, which only has load enough to require 40 pounds steam. Is it more economical to run with 80 pounds and large expansion or 40 pounds with small expansion? A. Run with high pressure and cut-off for required power for economy.

INDEX OF INVENTIONS

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March 9, 1886,

AND EACH BEARING THAT DATE.

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