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 This is for our information, and not for publication.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 Information requests on matters of personal rather than general interest, and requests for **Prompt Answers by Letter,** should be accompanied with remittance of $1 to $5, according to the subject, as we cannot be expected to perform such service without remuneration.

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

Minerals sent for examination should be distinctly marked or labeled.

(1) H. W. asks: What kind of a lightning rod is the best, and whether a copper rod is better and safer than iron or steel? Also how they should be placed on the building so as to give complete protection to the house? A. A copper rod is about twice as efficient as an iron rod of the same size. Either copper or iron will answer the purpose if large enough and well grounded. Have a good point at each gable and chimney, and connect all of the metal parts of the roof with the rod. Insulators are unnecessary. For a ground connection dig a trench deep enough to reach earth that is always moist. Have the trench lead away from the house. Make it ten feet long, and put in the bottom a layer of coke or metal scraps of any kind. Place the lower end of the rod along the middle of this layer, then cover it with coke or metal scraps, and finally fill in the trench with earth.

(2) E. E. F. asks: 1. How much larger must I make a dynamo than the one in SUPPLEMENT, No. 161, to get 4 lamps, each lamp equal in candle power to an ordinary kerosene lamp? A. The dynamo described in SUPPLEMENT, No. 161, is suited only to small uses. If you desire to make a larger machine, you should make one after the more recent Siemens, Edison, or Weston plan; you will find instructions for making such dynamos in the back numbers of the SUPPLEMENT and in works on dynamo-electric machines and electric lighting. 2. I have fine oilstone which has become glassy from bad oil being used on it. How can I raise the grit so that it will not become so again? A. Soak the oilstone in naphtha or benzine for several days.

(3) J. S. K.—The simplest way to make a strong permanent magnet is to purchase several of the ordinary horseshoe magnets sold at the stores, and bind them together with like poles and contact. Permanent magnets are made by rubbing the hardened steel across the face of an electromagnet or by inclosing the polar extremities in wire helixes, and then sending a current through the helix.

(4) R. R. M.—There is nothing superior to the dipping needle for indicating the presence of iron ores. You can obtain these needles from J. W. Queen & Co., No. 924 Chestnut Street, Philadelphia, Pa. We think that the ores taken directly from the beds would be fully as likely to be magnetic as those formed on beaches.

(5) E. R. asks if there is anything that will fasten ultramarine blue in cotton goods. A. Use albumen or casein.

(6) C. H. V. asks: 1. What oil is used for keeping sodium in? What causes the explosion when in contact with water? A. Naphtha. The explosion is due to the chemical action, shown in the rapid oxidation of the sodium by the oxygen obtained from the decomposition of the water. 2. How can I cool water, milk, etc., to about 40 degrees without ice? A. Use freezing mixtures. See answer to query 4, in SCIENTIFIC AMERICAN of June 21, 1884. 3. How can power be best transmitted 1,000 feet—by wire rope, compressed air, or shafting? A. All things being equal, cable wire is probably the best.

(7) B. F. S. writes: I did not meet with success in taking off ink from common writing paper. I took nitric acid and diluted it with water, but after the ink disappeared I could not write over the same place without it disappearing also. What is deficient or lacking? A. The best substances with which to remove ink spots are a cold aqueous or acetic acid solution of calcium hypochlorite, or else solutions of bleaching powder or eau de javelle. 2. What is the best receipt for a sea foam? A.

Bay rum	2½ pints.
Water	½ "
Glycerine	1 ounce.
Tinct. of cantharides	2 drachms
Carbonate of ammonium	2 "
Borax	½ ounce.

Mix them.

(8) D. R. R.—Rule for length of arc when chord and versed sine are given: Multiply square root of sum of square of chord, and four times square of the versed sine, by ten times square of versed sine; divide this product by sum of fifteen times square of chord and thirty-three times square of versed sine; then add this quotient to twice the chord of half arc, and sum will give length of arc nearly. To obtain twice the chord of half arc, add square root of the sum of square of chord and four times square of versed sine. A great deal of information of this kind is given in Haswell's Engineer's Pocket Book, which we can send you for $4.00.

(9) R. K. asks: 1. Is there a press for ox bones, and how are they prepared for manufacture? A. They are softened by soaking in water in acids, then split and pressed between heated plates, much of the work being then stamped out by cutters. 2. How must tallow be prepared for manufacturing white candles? A. The tallow consists usually of about ⅓ beef and ⅔ mutton suet. For use in warm climates this must be hardened. Among the various methods used for this purpose, the following seems to be the simplest: Use 1 pound of alum for each 5 pounds tallow. Dissolve the alum in water, then put in the tallow and stir until both are melted together, and run into moulds.

(10) Sam asks: What can be used (and how prepared) as an inflator to the toy or silk paper balloons, besides alcohol or kerosene? A. Hydrogen, the lightest of all gases, is readily generated by treating zinc with sulphuric acid. Take a bottle, put the zinc into it, add the acid with water, and the gas will come out through the mouth. Cover the mouth with a cork, and pass a quill or tube through it. To this connect your balloon.

(11) W. H. R. writes: About 30 feet in front of my residence, which is a Queen Anne cottage, runs a telegraph line. From the poles of this line are stretched six wires at a height about level with my roof. The chimney upon my roof extends probably six feet above level of highest wires. Now, do these wires afford any protection to the property from the dangers of lightning? Some say the wires protect it, and some say not. I confess I see no reason why they should, but it is said that no house or barn was ever known to be struck by lightning near a telegraph or railroad line. What is good, full, and exhaustive treatise on lightning protection? A. We think the telegraph wires would tend to protect your house against lightning; but your house should have a system of lightning rods well grounded to furnish the best protection. You will find three books on lightning protection in the Scientific American Book List.

(12) A. W. C. asks: 1. If white is the union of the primary colors, why won't a paint mixture of those colors produce white? A. Because the colors cannot be exactly arranged in the same proportions as those in which they exist in the spectrum, and pigment colors are not pure. 2. Would ½ pound of copperas in a sink be a good disinfectant, and not injure the pipe? A. 1½ pounds copperas to the gallon of water are the proportions recommended by the National Board of Health. It will not injure the pipes. A simpler disinfectant, and one much more convenient, is common salt in similar proportions. 3. Can you furnish a formula for medicinal pancreatine? A. Saccharated pancreatine is prepared as follows: The pancreas is dissected and macerated in water acidulated with hydrochloric acid for about 48 hours, then separated, and the acidulated solution of pancreas passed through a pulp filter until it is perfectly clear. To this clear solution is then added a saturated solution of sodium chloride and allowed to stand until the pancreatine is separated. This is carefully skimmed off and placed upon a muslin filter, and allowed to drain, after which it should be washed with a less concentrated solution of sodium chloride and then put under the press. When all the salt solution has been removed, and the mass is nearly dry, it is rubbed with a quantity of sugar of milk, and dried thoroughly without heat, after which it is diluted until ten grains emulsify two drachms of cod liver oil.

(13) B. asks how to wash flannels to prevent shrinking. A. It is almost impossible to prevent a little shrinkage of flannels in washing, unless the articles are dried on forms. Prepare hot suds beforehand, and agitate the articles in it without rubbing, then squeeze, not wring out, and dry quickly. The patent clothes wringers are an improvement upon hand labor, as without injury to the fabric they squeeze out the water so thoroughly that the article dries in considerably less time than it would do even after the most thorough hand wringing.

(14) R. M. F.—We would not be governed by a phrenological chart in forming our opinion of a young man, neither would we allow the chart to exert any influence in selecting a trade. If the young man does not know his ability and natural inclinations well enough to select a business for himself, we think he should embrace the first promising business opportunity, and do all in his power to succeed, and stick to it until he has sufficiently matured to select to determine to what business he is best adapted by nature and education.

(15) R. L. D. asks: 1. Is Swedes iron as good for electrical purposes as Norway iron? A. Yes. 2. Is No. 12 Bessemer steel fencing wire as good for a three mile line as No. 12 telegraph wire? If not, how does it compare? A. We would prefer the Bessemer steel. 3. Would the dynamo armature be better if made of Swedes iron than if made of ordinary cast iron? A. It depends on the kind of dynamo. If you refer to the small one described in the SUPPLEMENT, cast iron is as good as anything, provided it is very soft. 4. How different would the electro-magnetic machine described in No. 161 SUPPLEMENT be, if it was used to ring a polarized bell on a three mile line? A. The only difference would be that the thimble now forming the commutator should be entire, and connected with one terminal of the armature, and should be pressed by one spring only. The other terminal of the armature should be connected with the shaft, and a spring should bear against the end or side of the shaft. The current will be taken from the springs.

(16) W. S. C. asks how to fill the tube of a mercurial barometer. A. Place the tube in a very slightly inclined position with the closed end lowest, slip a piece of rubber tube over the open end, and pour in the mercury. When the tube is filled, lower the closed end and tap it very gently, to start the bubbles of air upward; finally place the tube vertically with the closed end down and let it remain for a day or so, then put your finger tightly over the open end, invert the tube, and place the open end in the cistern. In the best barometers the mercury is boiled in the bulb to drive out the air and moisture, but the above plan is simpler, safer, and answers very well.

(17) A. W. P. asks: What is used to blacken the graduating lines on boxwood rules? A. Asphaltum varnish is rubbed into the lines, and when perfectly dry is sandpapered off from the surface of the wood, leaving the black in the lines. This is not affected by the shellac varnish which is applied subsequently.

(18) C. H. C. asks the proper way to set a tool to cut threads on a regular taper tap. A. If cutting the threads with a chaser of several threads, the practice is to set the chaser so that all the teeth will cut. If with a single point, the best practice is to set the point so that both sides of the thread shall have the same angle with the center line of the tap.

(19) E. S.—Plaster of Paris is not suitable for moulds for brass. Any fine sand, such as quicksand wet with water containing a little clay, can be made a fair moulding sand. Use as little clay and water as will just make the sand hold together when squeezed in the hand.

(20) W. A. B. asks: 1. What is the best means of keeping a rest pin in piano from jumping, or not holding the string in tune? A. Try wetting it with turpentine. If this does not work, use larger pins. 2. A good cement or glue for fastening on felt, etc., to the action? A. There is nothing better than first class white glue. 3. A preparation for polishing the case? A. You do not state whether your piano case has been varnished and polished. If it has been once finished, you can give it a very good surface by rubbing it with a polish formed of equal parts of rather thick alcoholic shellac varnish and linseed oil, keeping up the rubbing until the desired polish is secured. In view of the skill necessary to use this polish successfully, we advise a trial on something else before applying it to the piano. 4. The reason a piano will not keep in tune, and remedy therefor? A. Either bad construction, unfavorable climate, or bad usage, or all combined. We could not suggest a remedy without knowing the cause. 5. The most scientific method of tuning a piano? A. Consult works on pianos or experts in these matters.

(21) W. C. F. writes: I have an immense pair of elk horns shipped to me from Colorado; they have been exposed to the weather for quite a while, and consequently are bleached quite white. Would like to know if their appearance would be improved by the application of some kind of a brown varnish; if so, what kind? A. Soak the horns for twelve hours in a solution of manganese sulphate, then wash with sodium carbonate, and on allowing to dry the color will change into the brown shade desired.

(22) A. L. P. asks: What is the best way to clean a bottle having contained a fatty substance? A. Alcohol will probably do it. Warm alcohol is better still, and ether or chloroform will dissolve most fats. Coal tar benzol or naphtha can also be used.

(23) J. T. asks how to compound a good indelible ink for marking towels, by means of brush and stencils. A. Printing ink sinks into woven fabrics to a considerable depth, and will last a long time. It is probably the cheapest marking ink that can be used with a stencil. Recipes for indelible stamping inks are given in SCIENTIFIC AMERICAN for December 13, 1884, and also in answer to query 3, in the SCIENTIFIC AMERICAN of November 24, 1884.

(24) P. J. S. asks how the black lacquer is put on opera and field glasses, and what kind of lacquer is it? A. Make a strong solution of nitrate of silver in one dish, and of nitrate of copper in another. Mix the two together, and plunge the brass into it. Now heat the brass evenly till the required degree of dead blackness is obtained.

(25) H. M. Q.—Water always runs down hill, and the Mississippi also runs down hill. The level in all parts of the earth is determined by gravity, and so accepted in all engineering work. The physical center of the earth only coincides with the plumb line on a belt around the earth at the equator, a zonal line in mid-latitude on each hemisphere, and at the poles.

(26) W. H. G. S. desires a good recipe for making pickle to keep beef, tongues, and pork. A. To each gallon of water add 1½ pounds salt, ½ pound sugar, ½ ounce saltpeter, and ½ ounce potash. Let these be boiled together until all the dirt from the sugar rises to the top and is skimmed off. Then throw it into a tub to cool, and when cold pour it over the beef or meat to remain the usual time, say 4 or 5 weeks. The meat must be well covered with pickle, and should not be put down for at least 2 days after killing, during which time it should be slightly sprinkled with saltpeter, which removes all the surface blood, etc., leaving the meat fresh and clean. Some omit boiling the pickle and find it to answer well, though the operation of boiling purifies the pickle by throwing off the dirt always found in salt and sugar.

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September 1, 1885,

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