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 This is for our information, and not for publication.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) J. C. M. asks how kerosene oil can be made a red color. A. Use the extract of alkanet root, sold under the trade name of alkanine, or make your own extract and color with that.

(2) P. V. I. asks (1) what receipt there is for making magic wire solder. A. Magic wire solder is ordinary strip solder. As flux for iron or brass surfaces you may use the following: Dissolve as much zinc chloride as possible in one part of alcohol and then add one ounce glycerine. 2. A receipt for making a liquid glue or cement for mending wooden, glass, or china ware. A. See the article on cements contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(3) H. C. asks (1) what preparation to put in any common ink, especially India ink, so it can be used for a hektograph. A. Mix with glycerine. 2. How to make black hektographic ink? A. Use a strong aqueous solution of soluble aniline black, in the proportion of about 1 to 5 or 7 of water. It must be a saturated solution, rather thick.

(4) A. S. asks: Is there any chemical or bleaching process known, by which dark colored animal hair can be given a bright color, say dark brown to light brown, or dark gray to light gray? A. Yes. Use hydrogen peroxide. See the articles on this subject contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 184 and 339.

(5) G. A. L. asks a formula for making modeling wax. A. Use whi e wax, which is melted and mixed with lard. In working it, the tools and the board or stone are moistened with water, to prevent it adhering; it may be colored to any desirable tint with dry color.

(6) H. W. C. writes: A farmer wishes to know how to construct a cheap and easily handled filter for water. A. Use two stone pots or jars, as shown in the accompanying engraving, the bottom one being a water jar with side hole, if it can be procured; otherwise, if no faucet can be used, the top jar can be removed to enable the water to be dipped out. The top jar must have a hole drilled or broken in the bottom, and a small flowerpot saucer inverted over the hole. Then fill in a layer of sharp clean sand, rather coarse. A layer of finer sand, a layer of pulverized charcoal with dust blown out, then a layer of sand, the whole occupying one-third of the jar.

(7) J. H. F. M. asks: 1. How long could a man live in pure oxygen? A. It is not definitely known how long a man would live in pure oxygen. 2. How long do the pearl divers hold their breath, and would it make any difference if they breathed oxygen instead of air? A. It would probably enable them to bear a longer immersion if they filled their lungs with oxygen before descending. A minute to a minute and a half is a fair period of immersion. 3. Is there any cure for a horse that is subject to colic? A. No general remedy can well be prescribed, as colic may arise from a variety of causes. Castor oil and laudanum are often recommended. 4. What is the pressure of water at the moment of freezing? A. Water in freezing can exert a pressure probably not less than that of 4,000 atmospheres. 5. What would be the effect if it was confined so it could not expand? A. If prevented from expanding, it will not freeze except at very low temperatures.

(8) C. W. S. asks: 1. What is the explosive force per square inch of two cubic feet of hydrogen gas and one cubic foot of oxygen gas, making three cubic feet of the two gases, at atmospheric pressure? A. The theoretical pressure from the perfect and instantaneous explosion of hydrogen and oxygen gases without compression is probably nearly 200 pounds per square inch. A much less pressure is obtained in practice. 2. How long will it take a cheap battery of one cell such as described in SCIENTIFIC AMERICAN of April 11, 1885, to decompose one pint of water, porous cup being two inches diameter inside and six inches high? How long with six cells? A. The decomposition of water by one or six cells, as described, is a very slow process. It will possibly require several weeks to decompose a pint. 3. Is there any substance that magnetism cannot act through? I notice watches advertised as anti-magnetic. A. There is no substance that will insulate a magnet. Watches are protec ed by iron cases or iron lining within the case, the substance thereof arranged to have possible magnetism of different parts balance each other. 4. Which is best for the battery—wrought or cast iron turnings? A. Cast iron borings or turnings.

(9) H. O. G. asks: 1. If a thermo-electric pile can be used to a good advantage as a thermometer in connection with a sensitive galvanometer? If so, how? If not, can you explain how the temperature outside may be indicated inside the house without too great expense? A. The thermo-electric pile indicates, in connection with a galvanometer, differences in the temperature of its two faces only. We do not see how it could be used as suggested. There is a company in this city who put up thermometers designed to indicate the temperature of distant places. 2. Will the expansion and contraction of zinc rods be greater if they are amalgamated than if not? And in what proportion can zinc and mercury be melted together to form a solid? A. We have no knowledge of the relative expansion of amalgamated or unamalgamated zinc. The former is extremely brittle, and would probably expand the most. A great deal of mercury is taken up before liquefaction by zinc, but it continually tends to separate from it.

(10) M. J. H. asks: A porter here takes care of some lamps—filling, lighting, etc. He has been found fault with for failure, so he says, to wipe the bowl proper of the lamp after it has been filled. This, however, he has done regularly, he says, and claims that the oil on the bowl is not due to carelessness, as charged, but to condensation of the vapor of the oil after the lamp has stood some time, or been in use. Is he correct as to the cause of the oil on the bowl? A. Kerosene oil "creeps," as it is called, by capillary action, and will often cover the outside of a lamp with oil, even though the same is taken good care of. Capillarity, and not condensation, is the force involved. Your party is probably taking every care of the lamps. Try the effect of wiping one off yourself. Perhaps he fills them too full, or neglects to turn the wicks below the brass when the lamp is not burning.

(11) A. W. R. asks: What are the poorest conductors of heat? A. Glass and porcelain are very poor conductors. All porous bodies are the same.

(12) C. F. J. writes: I would like to know how to make a rubber paste for patching the bellows of a camera which has cracked at the corners, so that there are several small holes through which light gets in and fogs the negatives during exposure. A. Try some of the liquid glues. These give good results. Or try a solution of gutta percha in bisulphide of carbon.

(13) E. J. R. asks: 1. How many pounds of insula ed wire will be necessary for field magnets and armature in dynamo described in SUPPLEMENT, No. 161? Also, if it should be of any particular brand. A. About 5½ pounds in field and ½ pound in armature. 2. How can tempered horseshoe shaped steel, about 3 inches across, be permanently magnetized on a large dynamo? Poles are a greater distance apart, that is, I cannot put poles of small horseshoe on two different poles of dynamo. A. You might run two bars of iron from the two poles of the dynamo magnet to the poles of your smaller one. This would give you some effect.

(14) S. C. H. asks; Must the secondary coil in a telephone transmitter be wound to about the same number of ohms resistance as the bobbin over the bar magnet in the receiving instrument, to get the best results, and also do they require to be wound to a higher resistance for long distance telephoning? A. The secondary coil in the induction coil of a telephone transmitter is wound to 80 ohms in the Bell Company's instruments and to 250 ohms in the Edison instruments. The receiver coil has about 80 ohms resistance. They are wound the same for all ordinary distances. They need not be wound to the same resistance.

(15) W. F. T. asks: Does a horse hair turn to a worm in water? If so, why does it do it? A. It does not do it.

(16) M. asks: Will you be kind enough to answer in your paper, how many and what are the primary colors? A. Seven is usually accepted as the number—violet, indigo, blue, green, yellow, orange, and red—but several scientists have proposed three as being really the primary colors.

(17) H. V. asks: Will you please oblige me by answering a few questions in SCIENTIFIC AMERICAN? 1. Will naphtha gas explode by an electric spark? A. Naphtha gas mixed with air forms a mixture that will explode by the electric spark. Naphtha gas alone will not. 2. What heat will naphtha evapora e at? A. At various temperatures, according to its manufacture, from 100° Fah. upward. 3. What heat is naphtha dangerous at? A. It is dangerous at all heats if near a fire of any kind.

(18) J. G. asks if there is an instrument that measures, accurately and instantaneously, distance, that is within the range of vision, from point to point on water or on shore, or from shore to a point at sea, or *vice versa*. A. Various instruments called stadia have been invented for effecting this purpose. An object of approximately known size must be present at the point whose distance is to be determined, to serve as a base line.

(19) J. P. H. S. asks how to color billiard balls. A. For red, macerate cochineal in vinegar, and boil the balls in the liquid for a few minutes; for blue, immerse for a short time in a dilute solution of indigo carmine; for yellow, immerse for a few minutes in water containing a little s annous chloride (protochloride of tin), afterward in a hot strained decoction of fustic; for violet, dye red first, then immerse for an instant in solution of indigo carmine; for green, dye first yellow, and afterward dip into solution of indigo carmine. Or use the aniline colors in solution without mordants.

(20) A. L. B. asks: What can be applied to rubber stuffs, like rubber bands, to keep them from rotting? A. We know of nothing except to keep them clean; oil or grease is very destructive to rubber. 2. What is the best way to prevent a flute being injured by the weather? A. A flute must be carefully kept, and is liable to suffer from any abrupt changes in the weather, and so should be preserved in chamois. We know of no better advice to give you.

(21) H. I.—Our imports of merchandise for the calendar year 1886 were $663,417,210. You ask how much the "working class would earn on these goods if made here, and not imported"? A considerable portion of the imports are of natural products, grown, not made, and that could not be grown here under favorable conditions. Probably one-half, however, represents manufactured products that really come into competition with those made by our own mechanics. How much more our workers would make by producing all such goods here, is a question that lies at the bottom of all tariff discussion, and which, consequently, we cannot be expected to enter upon in this place. If it were possible, however, for us to make all these goods ourselves, and thus shut out foreign manufacturers from our markets, is it likely that we could continue selling our products in foreign markets, as at present? Although our imports for 1886 were so large, our exports for the same period were still greater, reaching $713,289,666.

(22) C. J. H. R. asks: Can you tell me where to find a receipt for the ink used to re-ink type writer ribbons? A. Take of aniline, either black, blue, or violet, ½ ounce, alcohol 15 ounces, concentrated glycerine 15 ounces; dissolve the aniline in the alcohol and add the glycerine.

(23) A. C. S. A. asks: How far does Maud S. step when trotting her best? A. She strides about 19 feet.

(24) C. H. K. asks the process of stuffing a deer's head. A. We can send you Batty's "Practical Taxidermy and Home Decoration" for $1.50, which will give you full information on this subject. It would require too much room for a place in this column.

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February 1, 1887,

AND EACH BEARING THAT DATE.

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