

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 This is for our information, and not for publication.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. S. asks by what means street vendors of microscopes give the appearance of animal life existing in a drop of water. We have tried many drops of stagnant water, but are unable to discover the existence of animal life to extent shown by them on the street. A. The vender has a little sour paste at hand, of which he manages to get a particle in the drop of water he places in the field. See explanation in SCIENTIFIC AMERICAN of March 13, 1886.

(2) W. H. B. asks: 1. Is there any remedy that I can use to wash the eyes that will strengthen them and not injure them? A. Use a little salt in water for bathing them once or twice a day. 2. A description of a simple water motor that I can make to run a lathe? A. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 180 and 270, for simple water motors.

(3) C. W. asks if photographer's tin type is too thick for the diaphragm of a phonograph. What other substance could be used in the place of tin type? A. Tin type plate, or very thin tin, answers very well. Mica has been used for this purpose, with good results.

(4) Bell asks: How many Law cells do I need to ring a small resistance electric bell 400 feet distant? How do you work out such problems? Is there any other open circuit cell preferable to the sal ammoniac? What is the ordinary resistance of the common 2½ inch bell? A. Two or three would be sufficient. There is no way of working out such problems, as the constants vary with every bell; the sal ammoniac battery is the most popular for open circuit, although the Lalande-Chaperon potash battery is excellent; there is no standard resistance for such bells.

(5) N. J. G. asks how to make one or two batteries (to put in the same circuit with two Leclanche batteries) to ring a large electric bell three or four times a day. A. The battery described in SCIENTIFIC AMERICAN, vol. 57, No. 25, if charged with a solution of sal ammoniac, may be used in circuit with Leclanche batteries. The latter are, however, the best.

(6) J. L. S. asks if there is anything that can be applied to an old scar (in the face) that will take out the blue color. A. Under certain circumstances blisters made with croton oil have produced satisfactory results, but all such experiments should be made under the guidance of a physician who is a specialist in skin diseases.

(7) C. L. H. asks: How to make a liquid cement for putting bill heads, letter heads, etc., in tablet form, that can be applied cold with a brush, and also, how to color it red, blue, or green. A. The article generally used consists of a cheap glue with 5 per cent of glycerine made with a suitable composition with some coloring material like Prussian blue, carmine, or any other dry pigment.

(8) M. F. B. asks: 1. Does the presence of copper tubes in steam boilers cause electrical action to take place in the same? A. They are liable to. 2. If so, is that the reason they are not more used? A. The difference of expansion and contraction between copper and iron, with their additional cost, is the principal cause of their little use.

(9) B. P. asks how to test sugars and to detect if they contain any glucose. A. Dissolve the sugar in water, filter through charcoal if colored, then add Fehling's solution, and a red precipitate indicates glucose.

(10) F. A. F. writes: I have a valuable book near which a lamp upset and spilled part of it with oil—common kerosene. How can I remove the oil, without destroying paper or removing the ink? A. Much of the oil can be removed by cautiously heating the book, causing the evaporation of the more volatile constituents. Kerosene can be removed by passing a brush dipped in essential oil of turpentine, heated, over the paper while still hot. When it is removed, dip another brush into ether, chloroform, or benzine, and apply over the stain, especially the edges.

(11) L. W. M. asks (1) how to make or mix the wax for electrotyping. A. Put some common beeswax into an earthenware pot, and place it over a slow fire; and when it is all melted stir into it a little black lead or white lead, about 1 oz. to the pound of wax. This mixture tends to prevent the mould from cracking in the cooling, and from floating in the solution. The mixture should be remelted two or three times before using it for the first time. 2. The remedy for concaving of the mould? A. It will not concave if made thick enough. 3. What is "Star Moulding Composition," which is something besides beeswax? A. It may be the composition recommended in answer 1, or it may be beeswax alone, or a mixture of beeswax with resin.

(12) H. P. writes: I have a spirit varnish made of juniper gum, 80 gr.; mastic, 100 gr.; elemi, 30 gr.; concentrated essence of turpentine, 60 c. c.; castor oil, 25 c. c.; alcohol, 1 liter. I can color it red with dragon's blood, yellow with gamboge. What transparent brown stain can I use in connection with the

above? (It is for violet varnish.) A. Procure any aniline color from the druggist, of desired shade, and dissolve it in the alcohol, incorporating it directly with the other ingredients.

(13) A. Z. asks: 1. Can you give me the formula for making quinine and rum hair tonic? A. The quinine tonic has the following composition: glycerin, 4 oz.; alcohol, 3 oz.; water, 10 oz.; tinct. cantharides, 2 drachms; sulphate of quinine, 25 grms.; oil of roses, 2 drops; neroli, 5 drops; tinct. cudbear sufficient, and sulphuric acid sufficient to dissolve the quinine. The other consists of bay rum, 2 pints; alcohol, 1 pint; castor oil, 1 oz.; carbonate of ammonia, ¼ oz.; tinct. cantharides, 1 oz. Mix them well. 2. Is junior only used after a person's name when the father is living and bears the same name? A. When a man in business has become widely known as "Jr.," he sometimes retains the same form after his father's death.

(14) N. U. asks: What will remove "rust" from window glass. It is something that forms on the glass if stored in a damp place for a long time. A. Try a mixture of 30 parts of water with 7 of hydrochloric acid and a trace of iodine. Rub the plate with a linen rag moistened with the fluid and then polish.

(15) S. S. G. asks: Will there be any economy in fuel by using the exhaust from the engine for heating purposes where a number of coils of 1 in. pipe are used, and will the engine lose any power by so choking the exhaust? A. The use of exhaust steam is not only economical to the extent of its entire value as a heating element, but is coming into almost universal use in our factory practice. The later systems of distribution relieve the engine in some cases of any additional back pressure, and where long exhaust pipes are used can be made to relieve the engine from its normal back pressure. There are but very few places where more than from ¼ to ½ lb. of back pressure will be required to utilize the whole exhaust.

(16) C. J. M. asks: Is there any benefit derived from wetting bituminous coal before firing in an ordinary steam boiler furnace? A. None whatever, beyond the sticking of the dust and slack together, to prevent its falling through the grate, or the dust being drawn over the bridge wall in brick set boilers, or into the tubes of locomotive boilers, without being burned. All the water used in this way is so much heat wasted in converting it into steam to clog the tubes with vapors at too low a temperature for steam making.

(17) R. S. desires (1) a receipt for making a cheap, penetrating liniment? A. Alcohol, 1 quart; oils of origanum, 2 oz., and wormwood, 1 oz.; with camphor gum, 2 oz.; spirits of turpentine, 2 oz.; and tincture of cantharides, 1 oz. Mix. 2. A receipt for making a liquid glue. A. Fill a glass jar with broken up glue of first quality, then fill it up with acetic acid. Keep it in hot water for a few hours until the glue is all melted. 3. A receipt for making a cheap soap that will remove grease and paint. A. Take of aqua ammonia, 2 oz.; soft water, 1 quart; saltpeter, 1 teaspoonful; shaving soap in shavings, 1 oz. Mix together; dissolve the soap well, and it will be found to be an excellent grease eradicator.

(18) G. N. G. writes: In a 23 inch pinion driving wheel, with 24 teeth, with a 9 foot spur wheel, with 114 teeth, should the teeth be just the same size in both wheels to run nice, or should the teeth in the pinion wheel be a little smaller than those in the spur? The wheels are on a pair of hoisting engines. A. The pitch should be the same for both wheel and pinion, but the form of the teeth should vary with the relative variation in the size of the gears in respect to each other. See Nystrom's "Mechanics," which we can furnish for \$3.

(19) J. S. asks: If I place a hollow vessel at the depth of 20 ft. deep in water and fill it with air, say it contained 50 gallons, what amount of foot pounds of power would it produce in its ascent to the surface? A. The lifting power will be equal to the weight of the water displaced, with a correction for the weight of the vessel. A gallon weighs about 8.33 lb., which multiplied by 50 is 416½ pounds. Multiplying this by the distance gives the amount of foot pounds, 8,330 lb., leaving out of consideration the weight of the vessel. This should be subtracted.

(20) J. H. asks the proper way to set a tuyere iron in a forge, to set mortar over the rim, or let the rim of tuyere iron stand out over the mortar. A. Fire brick should be cut to fit snugly around the edge of the tuyere flange, a little above its face (say ¼ to ½ inch). If possible, cut the brick so that it will catch under the flange, which will prevent the loosening of the brick in working the fire.

(21) J. O. asks (1) what can be put on windows to keep the frost from accumulating on them? A. Wiping the windows on the inside with glycerine is a partial preventive of frost. Ventilation from the top or double glass is the best. 2. Will a stationary engine make a greater number of revolutions per minute with a steam pressure at 120 lb. than with a pressure of 100 lb., if the ordinary pressure carried is 100 lb.? Will not the governor regulate this and not let the speed increase? A. The governor will regulate the speed of the engine with variations of work; but will not keep the regulated speed with increased steam pressure, without being itself regulated for the increased pressure.

(22) M. I. asks (1) how he can increase the power of the 8 light dynamo described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 600, so it will work 12 lights. Would it do to wind the field magnets of the dynamo described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, with No. 18 double cotton covered wire? A. Do not depart from instructions given for dynamo described in SUPPLEMENT, No. 161. To increase the capacity of the eight light dynamo, double the width of the cores of the field magnet, double the length of the armature, using No. 19 wire on the armature, and same as in eight light on the field.

(23) S. asks in what form ammonia is used as a baking powder, and in what proportion with other powder. A. Mix ¼ pound tartaric acid, ½ pound alum, ¾ pound pure bicarbonate of soda, 1 pound flour, and 3 ounces carbonate of ammonia. A

better and simpler form of baking powder is the following: 30 ounces cream tartar, 15 ounces bicarbonate of soda, and 5 ounces of flour. Alum is considered injurious.

(24) F. B. F. asks: 1. How many 2,000 candle power electric lamps can be furnished with a 30 light dynamo? A. If the dynamo is rated for 30 arc lamps, but a few more can be supplied from it. Possibly the rating is below its real power. 2. If a greater electric current is sent over the wires, is that not the same as a greater electric force or power? A. The work done by an electric current varies not only with current or intensity, but with its tension. A greater current at lower potential could be distributed by the same expenditure of energy. 3. Does not each lamp added to a circuit offer additional resistance to the electric current? A. Each lamp added to a circuit in series increases the resistance. Arc lamps are usually used thus. If added in parallel with other lamps it decreases the resistance of the circuit. But it possesses its own definite resistance and counter electromotive force. If added to a circuit in either series or parallel, it will require additional electrical energy for its action.

(25) C. E. G. asks: What method can be used to clean the leaves of old books? A. See the processes described in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 115 and 124. 2. Can writing ink be removed from the pages, and if so, how? A. Some inks it is almost impossible to remove without also destroying the paper. You might try first washing the paper with warm water, using a camel's hair brush, then the paper must be wetted with a solution of oxalate of potash, or, better still, oxalic acid, in the proportion of one ounce to half a pint of water. Finally again wash the stained place with clean water, and dry it with blotting paper.

(26) A. M. H. asks the best way to remove burned oil from an engine, or other piece of cast or wrought iron. A. Use a strong solution of caustic soda and water. What this will not remove, take off with a scraper. Finish bright work with fine emery paper and kerosene oil.

(27) J. E. W. desires directions for analyzing ice; that is the formula necessary to detect impure parts in ice. A. Most of the impurities are soluble in water and hence can only be determined by an elaborate analysis. Of course solid impurities can be detected by filtration, and an excellent test is to evaporate a given quantity, and so determine the total solid. Bacterial examination is also used.

(28) A. L. C. desires a receipt for making Florida water. A. Take two drachms each of the oils of lavender, bergamot, and lemon; 1 drachm each of tincture of turmeric and oil of neroli; 30 drops oil of balul and 10 drops oil of rose; mix the above with 2 pints of deodorized alcohol.

(29) E. H. W. asks what cheap article to use to make sulphur tough. What be something that will dissolve under heat. A. Add resin or shellac to the sulphur.

(30) J. K. F. asks: What will take the stain of iron rust out of white marble? A. Take ½ ounce butter of antimony, and 1 ounce oxalic acid, and dissolve them in 1 pint water, add flour, and bring the composition to a proper consistence. Then lay it evenly on the stained part with brush, after it has remained on few days, wash it off, and repeat the process if the stain is not quite removed.

(31) G. C. S. asks how to clean silk plush so the surface will be as smooth and straight as new. Cleaning it with a liquid (as far as I know) leaves it in about the condition a drowned rat is in, fur all matted down. A. Clean it with the usual solvent, for which see table given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 153. Then, to restore the plush, hold the wrong side over steam arising from boiling water, until the pile rises; or dampen lightly the wrong side of the plush, and hold it over a pretty hot oven, not hot enough to scorch, however, or make a clean brick hot, place upon it a wet cloth, and hold the plush over it, and the steam will raise it.

(32) P. G. H. asks: 1. What should be the focal distance, and distance apart of a pair of 4 inch condensing lenses for a magic lantern? A. The 4 inch condensing lenses should be 7 inches focus each, and placed back to back, nearly touching. 2. What should be the focal distance and distance apart of a 2 inch objective of medium power (achromatic)? A. The 2 inch objective for a lantern should be 6 inches focus for each lens, plano convex; place 2 inches apart back to back. If each pair is achromatic, the details of curves should be known in order to advise.

(33) B. D. F. asks concerning the use of arsenic for the complexion, in what form is it used, and if Fowler's solution of arsenic is dangerous in long usage. If the usage of arsenic changes the colors of the blood, or has it effect on the skin? A. We do not approve the use of arsenic in any shape for the complexion, and would not indorse its employment except under the direction of a physician.

(34) E. L. H. asks: Kindly inform me what work gives internal resistances of various sized cells, etc. A. No such figures can be given, as every variation in the strength of solution makes the resistance vary. For bichromate batteries without porous cells, 12 square inches of zinc, to ½ ampere may be allowed. The following resistances are sometimes given:

Grove cell.....	½ ohm.
Daniell cell.....	3 to 5 "
Gravity cell.....	2 to 4 "
Smee cell.....	1 "
Leclanche cell.....	1 "

(35) R. L. McL. writes: I have ten Grenet batteries, each holding one pint of fluid. What candle power Edison lamp will they work, and for how long without recharging? A. A 3 or 4 candle lamp for one or two hours.

(36) W. W. B. asks: Is it a fact beyond question that plants emit oxygen by day and carbon dioxide by night? If so, can this reversal be accounted

for? A. Plants under the actinic influence of sunlight emit oxygen by day. At night they emit carbon dioxide gas. It cannot be accounted for any more than their other vital processes.

(37) C. C. B. asks: Will you kindly answer through your valued paper how sulphur may be rendered plastic and melted? A. By heat; also by pouring into water while melted, and in the viscous state. See query 29.

(38) Subscriber asks: Is there, or has there ever been, in existence any clock or other mechanism in which, while the motive power is being run down or diminished it is being replenished or renewed as fast as it is lost, so that, granting that the mechanism never wore out, it would continue in motion forever, without any addition to the original power? A. No.

TO INVENTORS.

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January 17, 1888,

AND EACH BEARING THAT DATE.

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