

Business and Personal

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Notes & Queries

A. K. can cast iron free from air holes by following the directions on p. 409, vol. 31.—F. K. will find a recipe for hair wash on pp. 267, 333, vol. 31.—R. J. will find that casehardening iron is described on p. 69, vol. 31.—R. N. will find directions for frosting glass on p. 264, vol. 30.

(1) B. B. N. asks: How and why does the magnet attract the compass needle, and extract its magnetism? A. By its superior power. When the two are placed with opposite poles in contact or near together, they tend to neutralize each other; but the magnet, being more powerful, demagnetizes and even reverses the polarity of the needle.

(2) W. S. R. says: I have a telegraph sounder, of which only one spool is wrapped, and I would like to wrap the other spool myself. I have enough wire to do it, but the good one is wrapped to the right, and I would like to know if the other is wrapped to the left, or as the first one is done. A. Wrap the same way and connect the inside ends together.

(3) J. T. S. asks: If I dissolve or liquefy wood or paper in sulphuric acid, is there any way of separating the liquid wood or paper from the acid? A. The action of sulphuric acid on woody fiber is to extract the elements of water, leaving it black and charred. If the clean fibers of the wood be digested in strong sulphuric acid for several days, a change will take place, and the cellulose will be converted into starch. If the acid is then largely diluted with water, boiled for several hours, and then carefully neutralized with chalk, a mass of glucose (grape sugar) will be obtained, which, if the process has been well conducted, may exceed in weight the woody fiber employed.

(4) P. D. B. says: I am in want of some material that will hold water, and in which ice, in congealing, will not adhere to the sides. A. Try vessels lined with smooth non-conductors, like porcelain, glass, etc.

(5) L. H. R. asks: How can I obtain a vacuum in a glass tube without the use of an air pump? I wish to seal the ends of the tube in such a manner as to admit the two wires from a battery, for an electrical experiment. A. Close one end of the tube by means of a blowpipe, and displace the air contained in the tube by means of carbonic acid gas. Then hermetically seal the open end of the tube into the mouth of a strong glass bottle or flask containing a quantity of caustic potassa. After a long time the potassa will have absorbed the carbonic acid contained in the tube, thereby forming a nearly perfect vacuum. That part of the tube just above its connection with the bottle may then be softened by means of a blowpipe (or Bunsen lamp), drawn out and sealed. The wires, previously placed in position in the tube, should be of platinum.

(6) J. M. asks: 1. Do bones that have been exposed for some years on the prairies lose any of their valuable properties as fertilizers? A. Very probably. 2. Is the demand for crushed bones sufficient in the Northern States to justify one in shipping the same from Texas? A. We do not think it would be advisable.

(7) F. C. & Co. ask: What alloy of metals turns nitrate of silver black, and what are the proportions? A. Nearly all the common metals and their alloys, when brought into contact with an aqueous solution of nitrate of silver, precipitate the silver in the form of a fine black powder. What will take the rust off the steel points of drawing instruments? A. Try a little emery paper and oil.

'8; J. C. L. asks: How can I make a small cord (about 1/8 of an inch thick) impervious to dampness without diminishing its pliability? A. Saturate it with a concentrated solution of copper in ammonia, and dry.

(9) F. A. W. says: 1. In melting silver I have used a flux of pumicestone and borax; and when I cast, part of the flux runs in with the silver. How can I avoid this? A. The pumicestone should be added in sufficiently large quantities to absorb the superfluous borax. Do not crush your pumicestone too fine. 2. How can I get the silver out of the pickle into which the bars are put after being cast, the pickle being made of sulphuric acid and water? A. Precipitate the silver in the form of chloride by the addition of muriatic acid. Then heat the precipitate together with a quantity of borax and a little rosin, in a small crucible, until the metal is reduced. The flux may then be removed by means of pumicestone as before.

(10) B. asks: Is glucine to be had in New York? A. We do not recognize any substance by this name.

(11) W. C. asks: Can you give me a recipe with which I can dissolve pieces of imitation tortoiseshell, so as to run it into molds? A. You do not state of what your imitation shell is composed. We of course must know its composition before we can tell what will make a good solvent.

Is there anything, not injurious, which will completely remove dandruff? A. Dandruff or pyriasis is a chronic inflammation of the skin, attended with redness and itching, and characterized by the production of minute white scales or scurf in great quantity. It may attack any region, but the scalp is the most common seat. Great cleanliness is the first consideration in its treatment. The use of tonic infusions and of sedative or alkaline lotions to the affected part are measures to be employed. A wash frequently used is the following: Boil 1 lb. rosemary in 2 quarts water, and add to the filtered liquid 1 oz. spirit of lavender and 1/4 oz. salt of tartar.

(12) F. L. asks: Is there any substance which will absorb coal gas when mixed in small quantities with the air in an ordinary living room? A. It can be absorbed by a solution of cuprous chloride in hydrochloric acid, presenting a large absorbing surface.

(13) L. S. C. asks: In the manufacture of brown sugar from cane juice, I have large quantities of muddy sediment in the bottom of juice vats, also a great quantity of skimmings: both are somewhat gummy in character, but as valuable as clear juice, if purified. Can this material be filtered through bone black, charcoal or any other material, and made reasonably pure, and how? A. You will require charcoal filtration, and Dumont's filter will probably work to your satisfaction. It consists of a wooden box of the form of a four sided truncated pyramid with a double bottom. The inner bottom is a metallic plate pierced with numerous holes; upon it a cotton cloth is laid, and coarse-grained animal charcoal moistened with water is then spread layer by layer, each layer being rendered of uniform thickness, and packed or pressed closely together by means of a trowel. When the bone black has been thus formed into a compact bed or stratum of about 1 1/2 inches in thickness, and within 5 to 10 inches from the top of the box, it is covered with another cotton cloth, and with another metallic plate pierced with holes. The object of the second cloth and metallic cover is to collect any substances which would otherwise obstruct the interstices of the superior stratum of the bone black, an inconvenient accident which is easily prevented by the use of such a cover, and this cover is readily exchanged for another, should it become itself obstructed. It is important, in order to avoid false passages, that the juice should be constantly at the same level of about three inches above the cover of the bone black. This is accomplished by means of a self-regulating cock. Animal charcoal is expected to purify, on an average, an equal weight of fine, or twice its weight of seconds, sugar. The same bone black may be employed any number of times, provided the substances which it has withdrawn from the sirup be removed. This is often done by simple rekindling. Consult Muspratt's "Chemistry," vol. 2, pp. 950 to 1,000.

(14) C. Z. P. asks: In one of your late numbers you said that silver (metallic) is to be re-obtained from nitrate of silver by melting it with borax or rosin. Will this be applicable for oxides or other metals, such as lead or zinc? A. Gold may be reduced by this method, but not lead, zinc, or any of the more common metals.

(15) S. B. P. asks: If the lower metals are alkaline, are the higher metals acids? Is there any distinct division between the alkaline and other metals? A. We do not understand your classification of the metals. The term alkali is restricted to those bodies, such as potash and soda, which have an acrid nauseous taste, and are unctuous to the touch. If the metals be arranged into a table with reference to their affinity for oxygen, the noble metals—gold, silver, platinum, etc.—will be found at one end, and the metals of the alkalis at the other. Those elements having the greatest affinity for oxygen are called electro-positive; while those at the other end of the list are known as electro-negative bodies. There is no definite dividing line between these, each element being negative to the one preceding and positive to the one following it.

(16) C. L. W. asks: What oil is best for oiling silk for insulation? A. Paraffin oil.

(17) B. asks: What is the formula for producing oxide of gold? A. The protoxide of gold is obtained as a dark green powder by precipitating the protochloride of gold by a dilute solution of potash.

(18) I. B. M. asks: What is the name of a microscopic organism, occurring in an infusion of walnut leaves last spring, and consisting of a cup-shaped head anchored by a thread to a twig? The thread slowly contracts to a spiral spring, and then suddenly and projects the head forward, as if to secure food. A. The microscopic organisms described by you are infusorial animalcules, of the family vorticellidae or bell animalcules. The genus vorticella consists of little creatures placed at the top of a long flexible stalk, the other extremity of which is attached to some object, such as the stem or leaves of an aquatic plant. This stem, slender as it is, is nevertheless a hollow tube, through the entire length of which runs a muscular thread of still more minute diameter. When in activity and secure from danger, the little vorticella stretches its stalk to the utmost, while its fringe of cilia is constantly drawing to its mouth any luckless animalcule that may come within the influence of the vortex it creates: but at the least alarm the cilia vanish, and the stalk, with the rapidity of lightning, draws itself up into a little spiral coil. But the vorticella is not wholly condemned to pass a sort of vegetable existence, rooted, as it were, to a single spot by its slender stalk; its Creator has foreseen the arrival of a period in its existence when the power of locomotion would become necessary, and this necessity is provided for in a manner calculated to excite our highest admiration. At the lower extremity of the body of the animal, at the point of its junction with the stalk, a new fringe of cilia is developed; and when this is fully formed, the vorticella quits its stalk, and casts itself freely upon its world of waters.

(19) W. W. B. asks: 1. What is the form of galvanometer used in testing the connection of a lightning rod with the ground? A. An ordinary tangent galvanometer of the form designed by Dr. Bradley is most convenient. 2. What is the method of operation? A. Two earth connections in addition to that of the rod are necessary. Call these B and C, and the rod A. Measure the resistance of A and B together, then A and C, and finally Band C. Add the resistance of A and B to that of A and C, subtract the resistance of B and C from their sum, and divide the remainder by 2. This will give the resistance of the rod alone. 3. Would a sink vault be a good place to insert a lightning rod? A. Yes, provided it exposes sufficient surface.

(20) J. W. F. says: In a rainstorm, four barrels of water were caught on one half of a roof of a house 16x24 feet. I claim that the same amount of water would have fallen on a piece of ground 8x24 (leaving out projection of eaves). A friend claimed that the roof, being 1/4 pitch, contained more square feet, consequently would catch more rain. Which is right? A. You are right. It is the same problem as that of perpendicular pickets in a fence running up hill; it takes the same number of pickets over a hill as upon level ground. When the rain is driven obliquely against the roof, there will, of course, be more to fall upon one incline, but just to the same extent will there be less falling upon the other.

(21) A. B. C. asks: 1. What is the proper pronunciation of Léclanché? A. Lehlanchui. 2. Please explain why the zinc of a battery is the positive pole or element (as stated on p. 107, vol. 33) when the flow of electricity is from the other pole to the zinc? A. There seems, at first sight, to be some inconsistency in using the terms positive and negative in connection with the zinc plate of a battery; but as any part of a circuit considered by itself must present both a positive and a negative pole, and as the outside poles alone are of practical importance, these are the ones alluded to when any are mentioned: the negative pole being that one towards which the current is directed. When the metal itself is referred to, we call that one positive which is consumed, because, in this case, attention is more particularly called to the direction of the current in the battery, and here it is from the metal on which the action takes place. 3. Which of the following four methods is best applied to lightning arresters for telegraph offices: Points, connected with the line wire presented to points connected with the ground. Line points presented between ground points, line points presented to a plain ground surface, or ground points presented to plain surface connected with the line? A. Experiments, made for the purpose, showing that those lightning arresters are most efficacious which combine, in one system, opposed points and opposed plates separated by very thin pieces of mica. 4. Why do you think that the best one? A. By their diffusive property, points tend to prevent an accumulation or charge; sometimes, however, the sudden presence of a great quantity of electricity exceeds this power of points; in such cases, the plates act like condensers, in which the potential becomes so high that a discharge takes place between them rather than through the instruments; this is what constitutes their principal advantage. 5. Is the efficiency of the arrester increased by increasing the number of points? A. Yes.

(22) E. M. C. says: Our orchards have been greatly infested with caterpillars, which seem to have few enemies, as no bird round here will eat them. But I have several times noticed small gatherings of red ants, and upon examination found them to be eating a large caterpillar; and since then I have often seen two or three ants attack, kill, and eat large caterpillars. Is this common? A. Yes. It is by no means a new discovery.

(23) A. K. asks: 1. How can a writing ink be made that will stand the test of acids, so that no acid can erase it? A. Aniline black, asphalt in turpentine, and coal tar in the same solvent have been used for this purpose. 2. What color is most permanent? A. Writing fluids are, as a rule, more permanent than ordinary black ink. After a short exposure to the air they become black, or nearly so.