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## Notes &amp; Queries

R. W. J. will find a formula for proportioning safety valves on p. 363, vol. 20.—J. F. can blue steel by the method described on p. 123, vol. 31.—J. S. will find that bronzing on iron is described on p. 233, vol. 31.

(1) J. A. M. asks: Can I magnetize cast iron? A. Yes, temporarily, by enclosing it in a wire helix traversed by an electric current.

(2) S. L. asks: 1. Do you think that a young Irish retriever could be broken of the habit of running away when a gun is discharged? A. Take your dog to a pigeon or shooting match, and gradually approach the shooters with your pet, and encourage him. Most dogs can be broken of gun shyness in this way, but some of them can never be cured. 2. Please give me the name of some handbook on training dogs for the field. A. The best book ever published on the sporting dog is "The Dog," by Mayhew, Dinks, and Hutchinson; it is published by Orange Judd & Co., 245 Broadway, N. Y.

(3) W. C. asks: Is a building, having a lightning rod which is formed of a copper pipe or tube laid flat on the roof and fastened with small strips of zinc to the roof and walls of the building, perfectly safe during a storm? A. The above method of attachment of the rod to the building is correct. But the main thing pertaining to the use of a lightning rod is to have the rod properly connected with the earth. The bottom of the rod, in the earth, must be greatly enlarged, either by having the rod extended underground for a long distance, or by connecting the rod with iron water pipes or iron drain pipes in the ground, or by placing the bottom of the rod in contact with a large mass of charcoal, which may be laid in a trench. No building is safe if the rod is merely stuck down a few feet into the dry earth. This is the common plan, but it is unsafe. Safety can only be secured by having an extensive mass of good conducting material at the bottom of the rod, in the earth.

(4) T. S. and others ask: How is transfer or indelible paper made, for marking clothing? A. The paper is probably saturated with a solution of bichromate of potash, logwood, and a little carbonized sirup.

(5) D. G. S. asks: Will a cosmorama lens of 36 inches focus do for the object glass of a telescope which I think of constructing, combined with an eyepiece of 1/2 inch focus? A. A common lens will not do at all for the object glass of a telescope, as it gives too defective an image. You must consider that the image has to be enlarged by the eyepiece, which will enlarge all defects also. For a telescopic objective, it is imperatively necessary to have an achromatic lens made of a crown glass bi-convex lens, and a correcting plano convex lens of flint glass.

How can I obtain sulphureted hydrogen? A. Pour diluted sulphuric acid on sulphuret of iron or on sulphuret of antimony.

(6) A. B. says: I made a magnetic needle out of a rat-tail file; and while polishing it upon an emery wheel, I thought of testing the action of moving bodies upon it. Having no point ready, I stuck it upon a sharp pointed lead pencil and held it in front of one of the emery wheels. It instantly began to revolve at about 200 to 250 revolutions per minute, running from right to left. I thought it was the current of air striking it, and held the needle on the other side of the wheel. It instantly checked its motion, and started in the opposite direction. In this position, the air would strike it in the reverse of the first position. To further prove it I held it opposite the wheel on the other end of the shaft; and to my surprise it stopped and started revolving in the same direction. It was not produced by air currents. Held between the two wheels, it also revolved. To further prove it, I placed it upon a pin and cork, putting it in an iron pan so that all currents of air would strike the bottom of the pan; and it still revolved, but at reduced speed. I came to this conclusion: Each wheel has a north and south pole, and the north pole of one wheel is opposite to south of the other. It may be that, when in motion, one wheel forms a north pole and the other a south. The wheels have iron arms filled with wood segments, and are covered with leather and

emery. Please explain the cause. A. Probably the wheels contain some residual magnetism, and one side is positively and the other negatively polarized. If the wheels are made of cast iron, this might readily be the case.

(7) C. C. P. asks: 1. Will leather scraps, ground down nearly to a powder, be of value as a fertilizer? A. Yes. 2. Are freshly ground bones in a fit state to be used as a fertilizer? A. Yes.

(8) J. C. asks: I have a piece of genuine moss agate which I would like to cut up in small pieces. How can I do this? A. Agates are cut by means of a small copper disk on a lathe, fed with emery. The surface is then coarsely ground by means of a grindstone of a hard reddish sandstone, and the polish is afterwards given on a wheel of soft wood, moistened and imbued with a fine powder of hard red tripoli.

(9) W. S. & S. say: We wish to make a siphon and draw the water from a well 52 feet deep with 75 feet fall. Can we form a vacuum and start the water running? A. The water could not be induced to rise out of the well without other aid than the mere pressure of the atmosphere.

(10) H. B. B. asks: Is there any cement or paint that would answer for lining a cistern to contain vinegar, that would not be destroyed by the acid nor spoil the vinegar? A. Vats of this character are sometimes coated with melted rosin. Is the refuse of the blacksmith's forge and furnace beneficial to fruit trees? A. It has been recommended for this purpose. Give it a trial.

(11) J. M. T. asks: Can you give me a process for cleansing the dark color from steel blades after cutting fruit? A. Rottenstone is used for this purpose.

(12) F. N. asks: 1. How can I fix colors on caoutchouc or on gutta percha? A. Caoutchouc is probably lettered with rubber solution while it is stretched, the coloring matter immediately dusted over it, and the whole allowed to dry. 2. How can two pieces be made to adhere to each other by the edges? A. By means of a caoutchouc solution in naphtha.

(13) P. B. asks: I have a portrait that is being destroyed by cracking and scaling off of the paint from the canvas. The cause is attributed, by those who profess to know, to the picture's being varnished before the paint was perfectly dry. Is there any remedy for it? A. We do not know of anything except revarnishing.

(14) J. S. asks: Will the residue of sulphuric acid and carbonate of soda, or marble dust, after having been used in the manufacture of soda water, be of value for manure? How should it be prepared? A. The excess of sulphuric acid can be completely neutralized by limestone, and the dried residue used as gypsum. Or calcined bones can be employed, and a mixture of the sulphate and acid phosphate of lime produced.

(15) A. B. G. asks: I want to color glass for lantern slides. How shall I proceed, so as to show any or all the colors of the spectrum in the screen? A. The aniline colors are mostly used for this purpose on a surface prepared with albumen or some similar substance. These colors admit of exquisite shades of fineness and, for this purpose, are remarkably soft and rich in tone. See p. 300, vol. 30.

(16) J. C. G. asks: What is the reason that these conderop of clover yields more seed than the first? A. The crop multiplies itself by scattering its own seed in the fall. This, in the spring, takes root, and soon more than replaces that portion of the last year's growth which has decayed, and which now acts as manure.

What is a good work on mnemonics? A. Consult Appleton's "Cyclopedia."

(17) J. W. K. asks: Can artesian wells be bored here, in Eastern Virginia? A. Yes.

1. How can I mount pictures? A. You do not state whether the pictures were on canvas or paper, also whether they are oil paintings, prints, or photographs. 2. What preparation is used to obviate the necessity of glass? A. Varnish is used for this purpose. 3. What is the origin of the word "remontant," and its meaning? A. It is a French word. Le remontant—the belt strap or belly band of harness.

(18) R. K. says: I have a fine hop vine; but the caterpillars are eating it up. What can I smoke them with so as not to injure the vine? A. Place under the vine a dish containing a small quantity of ignited charcoal: throw upon the coals a quantity of sulphur, and, if necessary, move the dish so that the ascending vapor may temporarily surround each twig and leaf. This is the most effectual remedy known.

(19) M. A. B. asks: What is the rule for calculating the variation in an aneroid barometer, caused by high or low temperature? A. The only correction necessary for an aneroid barometer is a slight one for temperature, detected experimentally thus: Observe carefully its indication at any moment in the external air; remove it immediately before a fire, and heat it until the thermometer on the dial shall reach 100°; then notice the variation of the hand; this variation, divided by the number of degrees through which the thermometer has moved, will give you the correction, whether in defect or excess, to be applied for each degree of change.

(20) W. B. asks: 1. What metal is least liable to tin when coming in contact with a soldering iron? A. Copper or iron. 2. Is there any metal or substance that will not tin, and yet will stand the heat of the iron and be not liable to break? A. We do not know of any such metal.

(21) G. M. G. says: 1. I am making ink composed of nut galls, gum senegal, sulphate of iron, aqua ammonia, alcohol, and rain water. When first applied, it is a pale purple, and slowly turns intensely black. What can I use to make it black when first applied? A. Replace the ammonia and

alcohol by a little alum. This we think would make a decided improvement. The addition of logwood to the ink would have the effect of rendering it black when first used, but such ink is much more liable to fade and corrode the pens. 2. Can you give me a cheaper and a better recipe than the above? A. Take 1 oz extract of logwood; pour over it 2 quarts boiling water, and, when the extract is dissolved, add 1 drachm yellow chromate of potassa. This is an excellent blue black ink, does not fade, and, as it contains no gum, flows freely from the pen. It can be made for about 25 cents per gallon. If an old inkstand is to contain any of this ink, it must be thoroughly cleaned, as ordinary iron ink decomposes the chrome compound.

(22) D. W. U. says: I wish to know how to keep strawberries in their natural color, to take to the fairs as curiosities. I have strawberries measuring 4 and 5 inches in circumference. A. The fruit may be preserved in many ways. One of the simplest methods is that of immersion in some solution of strong antiseptic properties, such as salicylic acid. To retain the natural color of the fruit for any length of time, however, is something quite difficult. We would advise you to obtain photographs of your mammoth fruit as soon as possible.

(23) C. M. asks: 1. What effect will dissolving blue stone in water, in which iron is to be casehardened, have? A. First polish the metal, and then place it in a sand bath until the desired color is obtained, then plunge into water. The addition of blue vitriol to the quenching bath would only serve to copper plate the metal as soon as immersed in it. 2. What preparation is there that, when put on casehardened work, will give it the fine glossy appearance that the fine English guns have? A. Try the following varnish as a lacquer: Gum sandarac 8 ozs, pounded mastic 2 ozs, clear turpentine 2 1/2 ozs, pounded glass 4 ozs, pure alcohol 32 ozs. Mix and dissolve.

(24) J. H. M. asks: What will absorb the ammonia, generated by the urine, etc., of horses in a stable? A. Sprinkle the floor and stalls with dry clay, which has a powerfully absorbent action upon ammoniacal vapors.

(25) W. H. P. asks: What acid is in rhubarb? Can it be extracted and concentrated, and how? A. The juice of the rhubarb contains oxalic, citric, and malic acids, the latter often in considerable quantity. We hardly think the plant can be utilized for lemonade, because of its characteristic purgative properties. The most objectionable acid of the three may, however, be removed in great part by chloride of calcium.

(26) H. J. E. asks: Do all kinds of iron crystallize under strain? A. No.

How is good mortar made? A. The lime ought to be pure, completely free from carbonic acid, and in the state of a very fine powder; the sand should be free from clay, partly in the state of fine sand and partly gravel; the water should be pure, and, if previously saturated with lime, so much the better. The best proportions are three parts of fine sand, four parts of coarse sand, one part of quicklime recently slaked, and as little water as possible. There should always be enough water added at first; if water is added after slaking has begun, it will be chilled and the mortar lumpy. The addition of burnt bones improves mortar by giving it tenacity, and renders it less apt to crack in drying.

Is the casting of small brass or iron articles smooth and without flaws considered as one of the lost arts? A. It is not; at present it is by no means impossible to make a perfect casting.

What is civilization? A. Civilization mainly consists in intellectual development, culture, and refinement.

(27) J. C. H. asks: How can I make the hardest alloy that melts below a red heat? A. Melt together 2 lbs. copper and 1 lb. tin.

(28) W. H. Jr. says: I have separated iodine from iodide of potassium by passing chlorine gas through a solution of it. The chlorine gas was made by the action of sulphuric acid upon calcium chloride. I now find that the solution of iodine contains some of the calcium chloride. How can the iodine be separated from it? A. It may be separated by distillation over a slow fire; but the temperature should not be allowed to rise above 350°.

(29) C. S. R. asks: What composition can be molded, either under pressure or otherwise, have a hard, smooth surface, and not be brittle nor liable to warp? A. Many metallic alloys, we think, would answer your purpose. See p. 11, vol. 31.

(30) S. E. M. asks: 1. Will the common gold fish spawn in a tank that holds 30 gallons water? A. Yes, if the tank be otherwise properly arranged. See pp. 36, 102, vol. 30, and p. 29, vol. 32. 2. What kind of plants will grow best on the bottom of the tank? A. Any of those indigenous to fresh water lakes and streams.

(31) R. B. R. asks: Suppose a suitable turbine wheel to be driven by a certain fixed quantity of hot water, forced through by high pressure steam, the apparatus being so arranged as to use the same water over and over again, such a quantity of water to be supplied only as will make good the loss by evaporation, and the steam used expansively: would such a motor be economical? A. It would be much more economical to use the steam in a well designed steam engine.

(32) F. H. B. asks: 1. Will good plumbago used in the cylinder of a new engine, be of service to prevent cutting? A. A true bore of cylinder and well fitted rings are the best preventives. It ought not to be necessary to use plumbago in a new cylinder. 2. Is there anything in the mixture of metal of which the cylinder and rings are cast, that makes some more liable to cut than others? A. Care is necessary in mixing the iron, to produce a quality that is tough and of uniform texture.