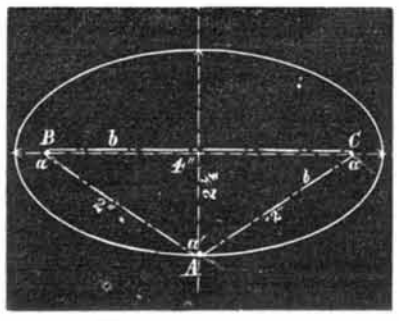
Notes & Queries

F. O. B. should consult a physician.—R. J. W. will find directions for gilding on furniture on p. 347, vol. 31.—S. A. T. will find directions for frosting glass on p. 264, vol. 30. Canvas can be preserved from mildew by the method described on p. 90, vol. 31. A black dressing for leather is described on p. 171, vol. 32.—W. S. O. will find a recipe for walnut stain on p. 90, vol. 32. Nickel plating is fully detailed on p. 171, vol. 30.—C. A. H. will find that a method of casting iron free from air-holes was described on p. 409, vol. 31.—Y. will find directions for making concrete gravel walks on p. 50, vol. 32.—A. B. M. will find that the induction coil and its operation have been fully described on p. 362, vol. 31.—E. B. M. will find a description of the type writer on p. 79, vol. 27. Shaving soap is described on p. 251, vol. 32. For gold ink, see p. 21, vol. 26.—W. M. W. will find recipes for hair wash on pp. 267, 363, vol. 31.—T. B. S. will find directions for preserving natural flowers on p. 266, vol. 31. M. T. D. will find directions for removing hair from the face on p. 229, vol. 28.—S. E. will find directions for casehardening iron on p. 69, vol. 31.—D. P. will find details of a remedy for foul water in wells on p. 59, vol. 32.—M. F. will find recipes for Worcestershire sauce on pp. 241, 281, vol. 26.—R. O. B. can mold rubber by following the directions on p. 363, vol. 30.

(1) G. A. W. says: I noticed in your issue of March 27 a method for marking out ovals, which is good as far as the description goes, but a great many mechanics do not know how to set the two pins to put the string around to make the oval of a given length and width. The following rule will be found simple and correct: If you wish to mark out an oval 4 inches in length, and 2¼ inches in width, mark out the length and width thus:



Take one half the length (2 inches) and measure from *b*, 2 inches, striking the line of the length at B and C; then set pins at A, B, and C, tie your string, *b*, around them; then pull up pins at *a'*, and use the pencil as you describe.

(2) L. A. W. asks: 1. What is magnetism? A. Magnetism is the power which certain bodies called magnets have to attract iron. Magnets are of two kinds, natural and artificial. Natural magnets consist of the ore of iron called magnetic or lodestone. Artificial magnets are made generally of steel, and are magnetized by rubbing against other magnets. No substance is indifferent to the magnet, though iron is most of all affected by it. 2. What is the difference between animal magnetism and electricity? A. There is no known connection between animal magnetism and electricity. If any exists, it has yet to be proved.

(3) I. H. asks: 1. How can I obtain the different colors of gold in electroplating? A. Make a mixture composed of 3 parts nitrate of potash, 1½ alum, 1½ sulphate of zinc, 1½ common salt. Add enough water to form a paste, which is put on the articles to be colored. Place them on an iron plate over a clear fire until they attain a nearly black heat, and then plunge them in cold water. Different hues may be had by varying the mixture. 2. Is there anything I can put in my silver solution that will prevent it from stripping? A. Clean the articles well and electroplate them slowly; and then the silver will not strip off.

(4) M. A. G. asks: Is there any kind of lamp in which I can burn kerosene oil, that will be safe if left to burn in a shop all night? A. Use a large lamp of glass, having a proportionally small burner, and good kerosene oil, and you will have no difficulty.

(5) A. H. H. asks: 1. What is the principle of the lightning arresters used on telegraph lines? A. A metallic plate is connected to the line and another to the earth, the two plates being separated by a thin insulating material. The principle upon which the arrester works is that the tension of the atmospheric electricity is so high that it will leap across the insulating substance between the two plates, and then pass off to the ground, while the regular current will stick to the wire. 2. Can you give your readers a table showing the electromotive force of the principal forms of battery now in use on telegraph lines? A. The electromotive forces of the various batteries are as follows: Daniells', Minotti's, Callaud's, Gianty's, and Hill's, 1·079 volts; Marie-Davy, 1·524 volts; Léclanché, 1·48 volts. Faure's carbon battery, 1·765; Grove, 1·812; Bunsen, 1·964; electropoin fluid (bichromate of potash), 2·028 volts. Grenet (chromate of potash) single element, 1·015 volts.

(6) M. W. M. asks: How can I magnetize a steel tack hammer? A. Draw it across the face of a strong electro-magnet in one direction.

(7) N. A. B. asks: How many methods are there of obtaining pure silver from silver coin, and what are they? I want the silver to plate with. A. Perhaps the best method for operations of this character on a small scale is the following: First dissolve your coins in nitric acid, and add muriatic until no further precipitate forms. Remove the liquid by filtration and wash the precipitate several times with hot water. Place the filtrate in a flask with some small pieces of zinc, and cover them with dilute sulphuric acid (1 to 4). When the zinc is completely dissolved, the metallic silver will be found in the bottom of the flask as a grayish black mass. The color is due to the fact of the silver being in a very finely divided condition. If you desire to use the silver in the metallic form (as an anode), all that is necessary is to melt it in a small black lead crucible, with a small amount of carbonate of soda.

(8) E. asks: What makes the wet end of a towel darker in color than the dry end? A. Less of the light is reflected from the wet towel, and more transmitted.

(9) G. W. H. asks: Are there any chemicals that change color in coming in contact with magnetized steel or other magnetized substance? A. We do not know of any.

(10) T. says: The accepted theory is that our earth was once a molten, incandescent mass. In support of this theory, among other phenomena, it is urged that the deeper the earth's crust is penetrated, vertically, the greater the degree of heat is developed. Now why is it that the further we penetrate the ocean, the less is the degree of heat attained? Will it be urged that the lower the temperature of water, the greater is its gravity? This is true down to 39°, but water at the bottom of the ocean, at the extreme depths that have been reached, shows a lower temperature than 39° Fah. A. What is urged is no objection to the theory of central heat, because the heat penetrates by conduction through the materials of the solid crust. But in the waters of the ocean this could not take place, owing to the free motion of its particles.

(11) E. E. M. asks: 1. Can an electro-magnet be constructed that will sustain a weight of 100 lbs., with one cell of a powerful bichromate battery? A. Yes. 2. How far will it attract a weight of 10 lbs. if it moved without friction? A. The attraction decreases as the square of the distance.

(12) D. McK. says: I want to make a small galvanic battery which, when I take hold of the wire, will give a considerable shock? What is the best method? A. You cannot get a considerable shock from a small battery except by passing the current through an induction coil. See p. 362, vol. 31.

(13) T. W. D. asks: 1. How is phosphide of lime made? A. Phosphide of calcium, commonly known as phosphide of lime, is obtained by the action of the vapor of phosphorus upon caustic lime at a high temperature.

1. How is balloon gas made? A. Either pure hydrogen, made by acting upon zinc or iron scrap with dilute sulphuric acid, or common illuminating gas (coal gas) is used for this purpose. 2. Will the gas from a kerosene lamp do? A. No. 3. How many square feet of gas will it take to raise a five lb. balloon? A. It will require about 140 cubic feet of coal gas, or about one half that volume of pure hydrogen.

How is gunpowder made? A. Saltpeter, sulphur, and charcoal are ground separately to powder, mixed, made into a paste with water, dried, and reground.

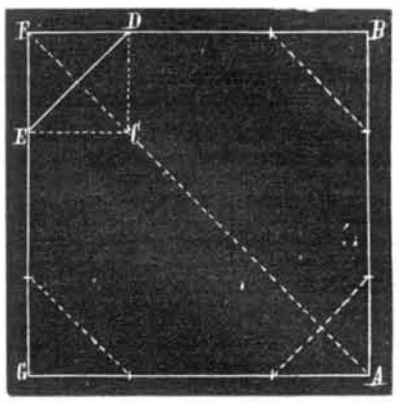
(14) H. S. asks: Would it improve the illuminating qualities of coal oil to mix a portion of sperm, lard, or other similar fixed oil with it? A. No. Use a better kerosene. It should not be volatile, and should have a high burning point.

(15) A. C. C. asks: Will you tell me what to put on glass so that I can take a photograph directly on it? A. The plate is first coated with an even film of photographic collodion, and is then placed in a bath of nitrate of silver for a short time. It is then transferred to the camera, and after exposure is washed, first with a solution of sulphate of iron, and then with a solution of hyposulphite of soda. It may be mentioned that it is utterly useless for one to attempt photography who has not devoted some time to the practical study of it. We would refer you to some work on the subject. If the back of the negative, obtained by the method as above described, be blackened, it will give to the plate, when looked at, the appearance of a positive picture.

(16) J. R. L. says: I want to make a preparation to use on black tobacco to prevent one lump from sticking to the other, and at the same time give the tobacco a good gloss. A. Try plumbago. Tinfoil cannot be dissolved so as to make it possible to add it to a mixture of oil and glycerin.

(17) C. G. D. says: I am manufacturing black writing ink from extract of logwood, bichromate of potash, prussiate of potash, powdered gum arabic, and water. After the ink is first bottled, there is a scum formed at the mouth of the bottle; but when this is removed there is no more formed. What is the cause of this? A. It is probably due to impurities in the materials used. Allow the ink to stand some time before bottling. Sulphate of quinine is sometimes used as a remedy.

(18) G. A. W. says: I have read the following directions for drawing an octagon in a given square: Make A C equal A B; then draw the square



C E F D, and line from D to E will be one side of the octagon. Proceed in the same manner in the other angles of the square A B F G. Is this a correct method? A. Yes.

(19) F. D. S. asks: Is there any chemical which I can mix with lard oil so as to retard or prevent oxidation when exposed to the air? A. No.

(20) P. S. G. asks: Is there any kind of coating suitable for umbrellas that will make the alpaca or gingham tops waterproof? A. Try the following: First sponge the cloth on both sides with a solution of 1 part sulphate of alumina in 10 parts water, then with a solution of soap, which is prepared by boiling 1 part light colored resin and one of crystallized carbonate of soda with 10 parts water, until the resin is dissolved. The resin soap thus formed is to be separated by the addition of common salt. This soap is then dissolved together with 1 part soda soap, by boiling in 30 parts water. After this last sponging, rinse in the rain.

(21) P. P. W. asks: How can I take the printed heads off an account book, so as to be able to write others in their stead? A. We do not know of any method by which this can be accomplished.

(22) J. G. C. asks: Is there any simple method by which an amateur in chemistry may ascertain the strength of a given sample of native black oxide of manganese? A. The commercial value of black oxide of manganese depends upon the proportion of chlorine which a given weight of it will liberate when it is heated with hydrochloric acid. This quantity of chlorine varies much in different samples, and is dependent upon the proportion of oxygen which the oxide of manganese contains in excess of that which is necessary to its existence as protoxide.

(23) J. E. C. asks: 1. Is there a liquid that will erase ink marks from paper, and leave the surface in a smooth state? A. Wash by means of camel's hair pencils, dipped alternately in solutions of cyanide of potassium and oxalic acid. 2. Is there any substance that will resist the action of mucilage when dry, except hard and vulcanized rubber? A. Yes. Most metals will do this.

(24) S. H D. says: Located near Titusville, Pa., is an immense gas well, struck nearly 4 years ago by parties who were drilling for oil. When first struck, it was accompanied by a curious phenomena. The gas was led away from the mouth of the well by 4 pieces of tubing, and this tubing was coated with ice from $\frac{1}{16}$ to ¼ of an inch in thickness. This was with an August sun beating down on the pipes; small pieces of ice were also thrown out of the well with considerable force. Of course the pressure on the pipes must have been very great with such an immense volume of gas passing through them, and I should have thought the friction would have caused heat instead of the reverse. A. It is a well known fact that, when a gas is allowed to escape from where it has been under pressure, it absorbs heat rapidly from surrounding bodies, and that this chilling effect is proportional to the pressure from which the gas is liberated.

(25) A. S. asks: How can I restore the polish to a nickel-plated stove which has been discolored by heat? A. Use chalk and chamois skin.

(26) C. A. B. asks: 1. What can I put in water to soften it? I have used sal soda, but it will color the clothes yellow. A. This may be accomplished either by boiling the water for some time, or by the addition of the proper quantity of clear lime water. 2. What is used to bleach clothes in a short time without injury? A. In bleaching cotton goods, the first operation consists in scouring them in a slightly alkaline solution, or, what is better, by exposure to steam. They are afterwards put into a basket and rinsed in running water. The immersion of cotton in an alkaline ley, however it may be rinsed, always leaves with it an earthy deposit. It is well known that cotton bears the action of acids better than hemp or flax; that time is even necessary before the action of them can be prejudicial to it; and by taking advantage of this valuable property in regard to bleaching, means have been found to free it from the earthy deposit by pressing down the cotton goods in a very weak solution of sulphuric acid, and afterwards removing the acid by washing, lest too long remaining in it should destroy the cotton. 3. Is there any way of polishing shirts, collars, etc., besides the ordinary irons? A. Put a bit of paraffin, the size of a hazel nut, in each bowl of starch.

(27) D. A. D. asks: Can you give me the method by which Berthelot was able to obtain alcohol by synthesis? A. By the formation of a solution of olefiant gas in oil of vitriol, which dissolves about 120 times its bulk of the gas, then diluting the mixture and submitting it to distillation. Small quantities of dilute alcohol are thus obtained with facility. Tritylic alcohol has been obtained by acting on tritylene in a similar manner.