Notes & Queries

(1) G. N. S. asks for the process of tinning malleable iron. The castings are small and easily handled. A. The articles are cleansed by pickling them for a few minutes in a bath composed of 6 lbs. of water and 8 lbs. of sulphuric acid, and scouring them with sand. They are then heated to the melting point of tin and sprinkled with rosin powder, or dipped in melted rosin, and then in molten tin covered with tallow, brushed with a piece of hemp, and rubbed dry with sawdust or bran. If small, they are simply placed, after heating, in a shallow vessel with some melted tin, and brushed about with a piece of hemp sprinkled with dry sal ammoniac.

(2) G. J. S. asks how aniline black may be dissolved without the use of acids or glycerin, and how the color may be made permanent. I wish to use it for ink. A. There is an aniline black in the market quite soluble in hot water; it is called soluble nigrosine.

(3) J. E. F. asks how to make a freely flowing black ink for sketching, etc. A. Triturate soluble nigrosine with a small quantity of boiling water, and strain the hot solution. When cold, the ink afforded is ready for use.

(4) G. McM. asks how to color billiard balls. A. Red.—Soak the pieces for a few minutes in weak nitric acid, and then in a strong decoction of cochineal in ammonia water. Black.—Use nitrate of silver dissolved in water, and expose the pieces to strong sunlight. Or steep for several days in a decoction of 2 lbs. logwood, 1 lb. galls, and then for a few hours in acetate of iron (iron liquor). Green.—Steep in a solution of verdigris, to which a little nitric acid has been added, or in a solution of distilled verdigris in acetic acid. Sal ammoniac is sometimes added to this solution. Do not use metallic vessels. Purple.—Steep in a weak aqueous solution of terchloride of gold, or boil for some time in a strong aqueous solution of logwood extract, and then add 4 ounces of alum to the gallon of solution, and continue boiling until the ivory is sufficiently colored. Yellow.—Steep for 24 hours in solution of lead acetate, and after drying in solution of potassium bichromate. Or steep the pieces in a saturated solution of orpiment (sulphide of arsenic) in strong ammonia, and dry. The depth of color depends upon the degree of concentration of the solution. Blue.—Stain them green and then immerse in hot solution of pearl ash. Or boil in logwood decoction and then in aqueous solution of copper sulphate. Or steep them in weak solution of sulphate of indigo, to which a little tartaric acid has been added. The coal tar colors, though brilliant, are apt to fade.

(5) C. E. N. asks how to make, and how to put on a good polish for black walnut tables used for hot and cold water in a bar room. A. Use a cloth cushion moistened with clear solution of 1 part shellac in about 10 parts of alcohol, applying a few drops of linseed oil to the cushion occasionally during the operation of polishing.

(6) E. D. S. asks: Is there anything that is applicable to window glass that will keep frost from accumulating on it, in cold weather? A. Glycerin is sometimes used.

(7) H. M. A. asks if freezing injures cider for drinking or for vinegar. A. No.

(8) C. L. H. asks: Can you kindly tell me in your paper some effective, cheap alarm for a bell telephone? I am unable to use an electro-magnetic bell for reasons. A. Such an alarm as you require is described in SCIENTIFIC AMERICAN SUPPLEMENT No. 161.

(9) H. M. N. asks: 1. What causes such a variety of colors to appear on oily water? A. It is due to the phenomenon called by physicists interference of light, caused by the varying thicknesses of the film of oil. A fine illustration of this may be observed in the soap bubble. 2. Why is tallow for steam engine cylinders preferable to any other lubricator? A. Pure tallow has less tendency to decomposition than oil under similar conditions. A pure hydrocarbon is, however, preferred by many, especially in high pressure engines.

(10) U. S. A. writes: 1. In your SUPPLEMENT No. 149, you describe how to make a simple electric light, and how to make the batteries. In battery, Fig. 4, should the small hole which is in the bottom of all flower pots be closed? A. Yes. 2. Should I put the same solution which is used in the pipe bowl, in Fig. 3, in the flower pot? A. Yes.

(11) Keho asks: Would a ten pound cannon ball sink to the bottom, if thrown in the deepest part of the ocean? A. Yes.

(12) L. E. L. asks (1) for an explanation of the principle of the gyroscope. A. See SCIENTIFIC AMERICAN, vol. 38, p. 335. 2. How can I make a cheap telephone? A. SCIENTIFIC AMERICAN SUPPLEMENT No. 142, contains full instructions for making telephones.

(13) C. M. D. asks how a Maynooth battery is made and charged. What liquid in the porous cup, and what in the iron one? A. It consists of a water tight cast iron cell, containing a porous cell, within which is a plate of zinc. The iron cell is charged with a mixture of equal parts of nitric and sulphuric acids, and the porous cell with sulphuric acid 2 parts, nitric acid 1 part, water 18 parts.

(14) M. asks: Is there any cure for a cracked plantation bell without recasting it? A. Drill a hole at the end of the crack, and saw through the crack to the hole. If the bell is too hard to admit of this treatment, we know of no cure.

(15) "Reader" writes: I have a hard rubber comb, it acts on paper and hair the same that a magnet does on a steel needle, why is it? A. Hard rubber, sulphur, wax, glass, and other substances, when rubbed with silk, flannel, or fur, become electrified and acquire the property of attracting light bodies.

(16) A. H. V. asks if Brazilian pebble spectacles are injurious to the eyes. A. They are generally considered better than glass.

(17) Otto writes: It is asserted that the whole mass of water in the Hudson (down to the very bottom) would flow north during the flood tide. Is it possible? A. We do not think the entire mass of water flows back with the tide. For a considerable distance this may be the case, but there is a neutral point beyond which the downward flow of the river is simply retarded.

(18) C. N. A. writes: I desire to construct an induction coil according to the method given in SUPPLEMENT No. 160, and would like to ask if it would not be possible to use coarser wire than No. 36 for secondary coil, without destroying the effect—say No. 30 or 32? A. No. 30 or 32 will not do as well as No. 36.

(19) L. H. asks: 1. In making India ink pictures with a brush how are the shades made smooth and merged evenly out into the white of the card board on which they are painted so that they will look like a photograph? A. The first requisite is the proper quality of paper. The tints should be carefully washed, one over the other, beginning with the lightest. 2. Is there a cheaper way than the electric pen to get several copies of written manuscript? A. Manifold paper is not expensive and answers a good purpose.

(20) A. H. writes: I have occasion to work in pearl, and I find a great deal of trouble in doing so, especially in turning it, it being so extremely hard. Will you give me some particulars in working it? A. There are two kinds of shells used in the manufacture of small articles; the porcelainous and the nacreous. The former are extremely hard, and can be worked only with the apparatus employed by the lapidary. The latter are more generally used, and may be sawn, filed, and turned, with some facility. The pieces should be roughed out on a common grindstone. After turning, they should be smoothed with pumice stone and water, and polished with rotten stone wet with sulphuric acid slightly diluted.

(21) G. J. B. asks: Is it possible for the ground under fifteen feet of water in the ocean to freeze? An old captain in this place says he has known it to be frozen off Fire Island in 15 feet of water. A. Not in water freely open to the sea. In confined coves it might possibly happen in the latitude of Fire Island, but even that is doubtful.

(22) G. W. M. writes: My friend holds that not one half of the leading astronomers believe the moon to be a lifeless planet without air or water, and I hold that fully four fifths of the astronomers believe it to be dead. Your opinion is desired. A. The moon is considered as lifeless by most astronomers.

(23) E. H. G. asks: Would a sheet of copper placed between two zinc plates, in place of the platinum sheet used in the "Kidder battery," produce a current of electricity? A. It would afford a fair current for a short time.

(24) P. F.: Kienmayer's amalgam for electrical machines is prepared as follows: one part of zinc and one part of tin are melted together and removed from the fire, and two parts of mercury stirred in. The mass is transferred to a wooden box containing some chalk, and then well shaken. The amalgam before it is quite cold is powdered in an iron mortar and preserved in a stoppered glass vessel. For use a little lard is spread over the cushion, and some of the powdered amalgam sprinkled over it and the surface smoothed by a ball of leather.

(25) W. C. M. asks for the names of the latest and best receipt books and chemistries on dyeing, as he is in the dyeing and scouring business for ladies' and gentlemen's goods. A. The SCIENTIFIC AMERICAN SUPPLEMENT contains the latest information on the subject of dyes. See Nos. 53, 55, 68, 74, 75, 76. Napier's "System of Chemistry applied to Dyeing." Gibson's "American Dyer." O'Neil's "Dictionary of Dyeing, etc." Smith's "Dyer's Instructor."

(26) J. L. asks: 1. Will the armatures of a number of telegraph instruments all make the same movement when the circuit is broken? A. Yes. 2. Would all move the same distance if the circuit should be closed before the armature of one had reached its full distance from the magnet? A. Yes, as we understand you. 3. Will the telephone work on a line in connection with a battery, or must the battery be cut out? A. A battery does not interfere with the working of the telephone when the circuit is continuous. 4. What is there to prevent the use of the telephone instead of the Morse telegraph? A. It has in many instances replaced the telegraph.

(27) C. W. asks: 1. What kind of carbon is used in the porous cup of a Leclanche battery, and is it powdered, granulated, or in lump? A. Use carbon from gas retorts. It should be coarsely powdered. 2. In what proportion is it mixed with the peroxide of manganese? A. We have see batteries filled with the carbon alone that seemed to work quite as well as those containing the peroxide of manganese. The proportions of the two should be about equal. 3. Should the porous cup be packed full or only partly full? A. The porous cup should be filled. 4. Will a pencil of zinc such as is generally used give as strong a current as a piece of zinc placed around the cup as in the carbon battery? A. Yes.

(28) W. S. R. asks: How can I polish a piece of marble? A. Smooth it with sand and water applied with a marble rubber, then rub it with pumice stone, and finally with a paste of putty powder, using a felt rubber.

(29) B. E. B. asks how the gilt work on gas fixtures is produced. A. In some cases it is simply brass, spun, burnished, or polished, and lacquered; in other cases it is produced by the application of bronze powders.

(30) J. McA. writes: Wishing to construct a dynamo-electric machine, after the plans given in SUPPLEMENT No. 161, I ask: 1. Does this machine, whether magnet is excited by battery or not, require an induction coil to be used, to produce an electric light? A. No induction coil is required. 2. Would common Western Union local battery answer instead of Bunsen cells; if so, how many? A. 10 or 12. 3. A light of what candle power will this machine produce? A. We do not know the photometric value of the light, but we think it would equal 4 or 6 gas jets. 4. Will increasing width, height, and wire on both magnet and armature increase the power of this machine in proportion? A. Yes.

(31) "Canuck" writes: I have made a pair of Bell telephones according to directions as given in *Popular Science Monthly*. Used a steel bar one quarter inch diameter and five inches long for core, and wound for one half inch on bar silk covered No. 60 copper wire until the diameter of bar and wire was about three quarters inch or seven eighths inch. Took the thinnest ferrotype plates for diaphragms and have used a Daniell battery varying in strength from one to twelve cells, still it fails to transmit sound. A. Use three eighths inch magnets, and No. 36 wire. No battery is required. See SCIENTIFIC AMERICAN SUPPLEMENT No. 142, for directions for making telephones.

(32) C. H. K. asks how many pounds pressure (steam) per square inch a boiler made of No. 14 standard gauge, charcoal iron, will stand with safety. Size of boiler 12 by 24 inches. Single riveted seams. A. Safe working pressure, 40 to 50 pounds.

(33) W. W. asks: What is the largest sized steam boiler that can be practically heated by crude petroleum? A. So far as we know, the limit is the same as obtained when coal is used as fuel.

(34) H. T. asks what is used to black the inner surface of tubes of fine optical instruments. It must be easily applied. A. Coat the surfaces with good gold size, and, while still adhesive, dust over it quickly lamp black, or, what is better, ivory black reduced by grinding to an impalpable powder.

(35) A. B. D. asks in which position can a bell be heard the farthest, on an open prairie, close to the ground, or on a tower two hundred feet high. A. On the tower.

(36) F. A. T. asks how to put a polish on fine walnut furniture. A. Mix with two parts of good alcoholic shellac varnish, 1 part of boiled linseed oil, shake well, and apply with a pad formed of woolen cloth. Rub the furniture briskly with a little of the mixture until the polish appears.

(37) T. J. B. asks: Should the slides of an engine be set a trifle lower at the end towards the crank to hold the weight (of piston) off the lower surface of the cylinder on a horizontal engine or not? A. They should be level.

(38) S. wants to know how much steam power would run a fan to furnish an ordinary blast for a cupola with a melting capacity of not more than 300 lbs. of iron. Fan the old style. A. It probably would not require more than half a horse power, at most.

(39) N. G. asks what photographers use to polish or glaze photographs. A. Heated burnishing rolls.