water. To filtrate and washings add a solution 1 part of potash in 3 of water until no more precipitate forms; filter. Two pounds of the shellac must previously have been digested in one gallon of strong alcohol. To this add, with constant stirring, the bleaching solution. After half an hour's standing add enough hydrochloric acid to give an acid reaction. The shellac is precipitated, and must be washed and kneaded in hot water until the water passes off clear. It is then dried in the air. The filtrate may be neutralized by addition of caustic soda, and the alcohol may be recovered from it by distillation. 4. What wood is methyl alcohol made from which is used for polluting spirit into methylated spirits? A. Oak wood gives good results, though any wood may be used. 5. Does not the electric current, when passing a long a copper wire, pass through the exterior of the wire for its course in prefereuce to the core of the wire, or equally throughout the wire? A. Under ordinary conditions (dynamic electricity) equally throughout the wire. 6. Has it ever been decided that the electric current flows only in one direction when in complete circuit, and that it is from negative to positive pole? A. No. There is no flow except as a matter of convenience in nomenclature. 7. Would a new departure in carbons (for street lamps), which would yield twice the amount of light given by those now in use (with the same dynamo power), be advisable, even though such new make of carbons lasted only half time the present ones do, and cost the same at first? A. It might seem doubtful, because the great desideratum is to have carbons last a long time. But the line indicated seems so hopeful a one that it would probably well repay work and investigation. 8. I notice sheets of [mica are never used for photographic plates for negatives; is there any good reason that unfits them for preparation for that purpose? A. They are rarely clear enough, and if large are very expensive, and are also friable. 9. How could I silver fluted and convoluted glass articles with quicksilver? I manage sheet glass all right after the old method, but fail with irregular surfaces; is there any way of brushing it on to the glass in the shape of a sort of mercury paint? A. See query 438, SCIENTIFIC AMERICAN, March 16, 1889. 10. I wish to cut or turn a hole with radiated grooves through a block of boxwood, not a screw worm hole, but a sort of ratchet cycle groove, each groove to be uniform. How could I do so? A. This you might do with a hand tool, groove by groove, or cut a special cbaser with straight cross-cut teeth. 11. What is the rule followed for sighting rifles? I have two of different makes; the foresight on one is merely a pin's head and the back sight very low for 200 yards; whereas in the other the foresight is a semi-disk standing up quite an inch, with a back sight also very high. I can score equally as well with either, at 200 yards. A. The shape of rifle sights is largely a matter of personal preference. Certain forms are generally considered more accurate than others, and sometimes may be "barred" or disallowed in matches.

(750) G. S.—The soldering liquids are for making a perfect contact of the metals and their easy flow. Heat of a soldering copper is necessary for melting the tin and flowing it upon the surface.

(751) A. B. asks: Is there any way to prevent the corrosion of the connections of the carbons of a Grenet battery? A. Heat the ends of your carbons and apply paraffine, allowing it to soak well into the carbon. This will prevent the solution from reaching the electric connection of the carbon. Care should be taken to prevent the paraffine from reaching the portion of the carbon which extends into the solution.

(752) B. F. A. asks: When a weak solution (say 1 to 2 per cent) of copperas, protosulphate of iron, is mixed with decaying vegetable or animal matter, what are the principal reactions that take place? I notice that copperas is an effective deodorizer, but do not understand its action. A. Your question is a difficult one. Offensive putrefaction is due largely to germs and low forms of bacterial life. Copperas is poisonous for these organisms, and so prevents decay.

(753) H. W. D.—So many young men are entering the field of electrical engineering, that you will find it very hard to find a position. You should be willing to take any place that is in the electrical department, even if it is merely in charge of lamps or in the dynamo room. Wages will be low, work perhaps disagreeable to you, and the working up process will depend partly on your own activity and knowledge of the science and partly on opportunity. You will be in competition, moreover, with technically educated men. Having secured a place with some company, you should read and study assiduously. The addresses of companies can be procured from electrical journals' advertising pages.

(754) A. E. S.—Make your magnet cores of soft iron three-eighths of an inch in diameter and one and one-quarter inches long, and wind the cores to the depth of the diameter of the core with No. 24 wire. We think that with a magnet of this kind you will have no further trouble with the bell.

(755) R. M. asks: 1. Will the dynamo explained in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, run incandescent lamps? If so, how many and of what power? A. It will run three five-candle power lamps of low resistance. 2. Would the current running through a one-eighth inch bare wire on a circuit of 1½ miles, lighting about 200 Edison 16 candle power incandescent lamps, be strong enough to cause death if a person should take hold of one of those wires? A. Probably not, but we would not advise the handling of such wires.

(756) W. N. B. writes: In producing an electric light of ⅛ to 1 candle power, would it not be less expensive at the end of a year to use an induction coil with one or two good cells of battery than to use a large power of battery alone? I wish to produce enough light to illuminate the front of a safe just so it will be visible during the night. A. You would gain nothing in economy by the use of an induction coil in the manner proposed. The only advantage of an induction coil in electric lighting is in the distribution of the current. It permits of using a current of high potential on the line wires, and of reducing it at the point of use to a current of low potential suitable for incandescent lighting. We think it would be better if you were to employ a few cells of gravity battery and a storage battery.

(757) H. L. H.—For making emery wheels see SCIENTIFIC AMERICAN SUPPLEMENT, No. 125. 2. For preserving paste add a little alum water, 3 per cent, or a few drops of carbolic acid. Salicylic acid is also an excellent preservative. 3. For black dye for leather: Boil 3 pounds logwood chips, ½ to 1 pound fustic shavings, in 1½ gallons water; boil, filter, and apply to the surface of the leather. Then apply a wash solution of sulphate of iron. Dress the leather with oil or varnish as required. 4. For a quick-drying clear varnish use mastic dissolved in ether, or to make your shellac varnish clear, dissolve fine shellac in wood alcohol and allow it to settle in a bottle and decant the clear varnish. The muddy varnish is too thick for lacquer work. It is made for painters' use.

(758) L. J. writes: A ball falls 64 feet from the mast of a moving ship to the deck. During the time of the fall, the ship moved 24 feet. Represent the actual path of the ball. Find its length. A. The ball will fall vertically from the mast to the deck, as a plumb line would hang, save variation by the wind. In relation to a stationary vertical line, the path of the ball would be parabolic, having the vertical line at the moment of starting as the axis, with the acceleration of fall and the motion of the ship as co-ordinates. By working out the co-ordinates for moments of flight you will obtain the true length of the curve.

☞ Books or other publications referred to above can, in most cases, be promptly obtained through the SCIENTIFIC AMERICAN office, Munn & Co., 361 Broadway, New York.

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