Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(5249) H. M. W. says: A friend of mine, a practicing physician, carries a tie weight in the front of his buggy and it continually winds up the strap. The movement is from right to left or against the sine. It does not seem to matter how the buggy is loaded. Can you explain the phenomenon? A. The turning is probably due to jarring of the vehicle and slight projections on the bottom of the weight.

(5250) W. V. S. asks: Will water boil in a pot set in another pot of boiling water? If so, how? A. No; not unless you put salt in the water of the outer kettle. Brine boils at a higher temperature than water.

(5251) J. McG. asks how to make brewer's yeast. A. Brewer's yeast is prepared as follows: 72 pounds unkilned malt and a handful of hops are gradually stirred in a clean tub containing 7 gallons of water of 170° Fah., and to this 5½ gallons of water of 200° are added. The tub is then covered tightly and left quiet. After some time it is cooled rapidly. This is accomplished by setting in cans filled with cold water. When the temperature of the mash has reached 70°, the tub is covered again and allowed to stand for some twelve hours longer, when 1½ gallons fresh beer yeast are to be stirred in. After another twelve hours have elapsed, pierce a hole in the layer formed by the husks of the malt and dip 3½ gallons of the liquor beneath, then stir the whole up and dip 1¾ gallons from it (husks and liquor). This is the mother leaven, from which yeast can be generated all the year round by using it in the way described instead of the ordinary beer leaven. To the remainder in the tub add 5 gallons wort of 90° and make use of it within two hours. The mother yeast also must be used the same day for fermenting another portion.

(5252) A. E. L asks how to make skeleton leaves. A. A quick method is as follows: Four ounces sal soda are dissolved in 1 quart hot water, 2 ounces quicklime are added, and the whole boiled for twenty minutes. The solution is cooled and strained. The leaves are then boiled in this for one hour, or until the pulp is easily removed, when it is washed off as already mentioned. The fibers remain, leaving a perfect skeleton or framework of the leaf. This is bleached by exposure to a solution of 1 tablespoonful of chloride of lime in 1 quart water, strained clear from sediment. The skeletons are placed in a dish, covered with this solution and kept in a dark closet for two days, watching in the meantime that the fibers are not softened too much and thus injured. After bleaching, the leaves are steeped in clear soft water for a day and then floated off upon a card and placed between soft napkins until dry. They are then ready to be finally pressed, bent, curled, or arranged in bouquets or groups.

(5253) C. H. J. asks: 1. Will you inform me if the first charging forms the storage cell described in SCIENTIFIC AMERICAN of March 4, 1893, page 134, or is a more complicated process necessary, and what is the process? A. To form a storage cell it is necessary to charge it and discharge it several times, each time reversing the charging current. After it is formed it should always be charged with the current passing in the same direction, and that should be the same as last used in forming. 2. Is it necessary to form them with a bichromate cell, or can it be accomplished with the gravity? A. You can form them more rapidly with a bichromate cell or dynamo than with gravity cells. 3. Should the gravity be connected in series, and how should the storage be connected when charging and discharging? A. The cells should be connected in series, four gravity cells to each cell of storage battery. 4. Is it possible to charge two sets of secondary cells separately and then to discharge them connected together in series, etc., and would the time of charging of the two or more sets have to be exactly the same? A. The batteries can be charged in this way, but they should be charged to the same voltage. 5. How long would it take 16 gravity to charge 4 storage, and would the 16 gravity charge any more than 4 storage at a time? A. It would take from 8 to 10 hours to charge the storage cell. You could not make a more advantageous combination with 16 cells.

(5254) A. G. G. asks (1) why the water of a whirlpool always flows in a direction contrary to the hands of a clock? A. A whirlpool may have either direction of rotation. 2. Is there any method of nickel plating without the aid of batteries? If so, how? A. On some bases a coating may be produced without a battery, but it will not be a satisfactory one. 3. What are eye stones? Are they supposed to possess life? A. They are the opercula (closing or door shells) of certain shell fish (*turbinidæ*). Their action on the eye is mechanical. They are devoid of life.

(5255) W. S. asks: How is phthalic acid (anhydrous) made? A. By acting on naphthalene, alizarin or purpurin with nitric acid, phthalic acid ($C_8H_6O_4$) is produced. By heating this to a temperature exceeding 365° Fah., phthalic anhydride ($C_8H_4O_3$) is produced.

(5256) W. H. J. asks: 1. Is the term horse power, used as a unit of power, in estimating the efficiency of a steam engine, equivalent to the horse power of 746 watts used by electric engineers? A. Yes. 2. Can a steam engine of say 10 horse power drive an electric generator and produce more than 10 horse power of electric energy? What per cent gain or loss of power would occur? A. A loss of from ten to twenty-five per cent may be anticipated.

(5257) E. C. J. writes: I am making an electrical machine consisting of a glass wheel and rubbers. I should like to know in what way I could fasten the wheel to a brass axle so that the wheel could bear a great strain when turned. I thought of getting a flange to screw uptight to the glass on either side, but I fear it will break the glass. Could a cement of some kind be put between the flange and the glass? If so, please state what kind and its preparation? A. You can clamp your glass disks between collars on the shaft as you propose without danger of breaking the glass, provided the glass is flat. We would suggest a cement of plaster of Paris put between the flanges and the glass.

(5258) H. J. S. asks: Which will take the most force, the pipe running up outside and running the water in at the top or with the pipe screwed in the bottom of the tank? A. It requires the most power to pump the water over the top, by the difference in pressure between the level of the water in the tank and the inlet pipe added to the friction of the additional pipe to carry the water to the top. This amounts to 0·43 of a pound pressure for every foot of height between the level of the water in the cistern and the mouth of the pipe at the top. The friction of a few feet of pipe is small, but still a factor of lost power in a discussion.

(5259) Richmond says: If you take a tub of water weighing 50 pounds (tub and water), the tub being half full of water, and put a 5 pound live fish in the tub of water, none of the water being forced out, will the tub of water weigh any more with the live fish in it than it will without it? If so, how much, and how do you account for it? A. The tub, water, and fish will weigh exactly 55 pounds. This old yarn has been answered many times in this journal and many more directly. We are in hopes that some of our readers will eventually get out of this class of ruts, take to the physical facts of nature, and come to the conclusion that nothing comes from nothing and that one and one makes two every time. Everything that has weight when added to a weight increases the weight, whether animate or inanimate, fluid, air or gas.

(5260) J. H. R. writes: I have an electric bell from tank to house that rings when tank is full; the connection is made under water by a float pulling a brass wire against a copper wire above it. The copper wire will corrode in a few hours, so that a connection will not be made. Will you kindly help me out? A. We think you cannot expect good results from your electric circuits until you place the contacts outside of the tank. This you can readily do by connecting a rod with the float.

(5261) E. L. writes: 1. I saw in your last SUPPLEMENT to SCIENTIFIC AMERICAN a very good description of how to make a cheap and simple electric motor. Now I ask is it possible to make likewise a dynamo of such simple pattern, for running one or two Edison standard lamps? A. We have no description of a very small dynamo that will light one or two Edison standard lamps, but you will find in SUPPLEMENT, No. 844, a detailed description of an Edison dynamo for nine lamps. 2. I have got a small electro-magnet, used for medical purposes; the maguet does not work properly. How or where can I get it charged again? A. You can have your permanent magnet recharged by any electrician, or it can be recharged at any electric light station.

(5262) J. B. asks: Is there any way to harden steel castings, can they be tempered? A. Steel castings can be case-hardened by the same process as for iron.

(5263) J. H. S. asks: What amount of horse power can I get from an underflow wheel in a stream with a current 4½ miles an hour, 100 feet wide, 3 feet deep, the wheel to be 20 feet diameter, 24 feet wide, paddles 2×24 feet, with a cable wheel 10 feet diameter, to convey power 150 feet distant? Also how fast will the wheel run when power is on? A. Wheel should run at a peripheral speed of one-half the water velocity, or 6½ revolutions per minute, and should transmit 8 horse power through the cable.

(5264) B. A. M. asks: How can canvas be made mildew-proof at a small expense? A. Immerse the canvas in clear tan bark liquor, of about the strength of 1 pound oak bark to 4 gallons water, boiled settled and decanted, for a few hours, then rinse and dry. This will give the canvas a slight color. A wash of alum water 1 pound to 4 gallons water answers a good purpose and does not change the color.

(5265) H. S. asks for a receipt for that kind of brass that is commonly known as gun metal. It is used for the hubs of bicycle wheels. These castings are done at a very low price (about eighteen cents per pound). I would like to know how it can be done. A. The best gun metal is an alloy of 9 parts copper, 1 part tin, by weight.

(5266) L. C. D. asks: 1. Is there any satisfactory explanation of why a ball can be made to curve being delivered from the hand of a pitcher? A. The throwing of a curved ball is illustrated and explained on scientific principles in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 402, 410, 423, 10 cents mailed. 2. Peculiar freaks in electricity are often seen in the shape of luminous balls which move comparatively slow, and if they strike a wooden surface, will bound off. They are, I think, called St. Elmo balls. Can you explain the phenomenon? A. St. Elmo's fire is a peculiar condition of low electric intensity in the atmosphere, such as often occurs in fair weather, when by supposed induction and insulation, pointed objects projecting above surrounding objects become surcharged with the electric fluid and a brush discharge takes place, without audible noise, but with a feeble luminous glow. It has been observed on spires, on the masts and spars of ships. 3. Does electricity stream on as well as off a point? If it does not, does a lightning bolt go from the cloud or *vice versa*? A. Electricity passes in the brush form of discharge from generating surfaces to conducting surfaces when of low intensity, and both ways between conductors. The lightning bolt occasionally passes upward by the reverse atmospheric conditions as to polarity.

(5267) C. S. asks: In regard to deep wells, which water would be the most healthy, that out the black iron casing pipe or out of the galvanized casing? A. Water that is constantly flowing from a deep well pipe is equally healthy from both black and galvanized pipe. If the water is checked for a time without flow, the water from the black pipe may become charged with iron and will not be palatable, although healthy, while water standing in the galvanized pipe becomes charged with zinc oxide, which is poisonous. If then, the contents of the pipe is drawn off, the following water will be good.

Replies to Enquiries.

The following replies relate to enquiries published in the SCIENTIFIC AMERICAN, and to the numbers therein given.

(5186) Referring to SCIENTIFIC AMERICAN of July 15, page 45, paragraph 5186, will you please say to G. L. F. that if he will plant tansy about the trunks of his plum trees, a good thick growth of it, the fruit will not be stung. As the plums ripen, the skin will be coated with a sort of frosting or bloom bitter to the taste, but easily rubbed off. Fifty-odd years ago I noticed this in my father's garden, about a wild plum transplanted from the woods. I think it never failed to yield an abundant crop, the fruit increasing in size and quality. The tansy was supposed to spread several feet from the tree trunk. If, upon trial, G. L. F. is pleased with result, he will oblige the public, and I hope Professor Riley especially, who has done so much for the cultivators of fruit and grain, flowers, etc., by asking the SCIENTIFIC AMERICAN to acquaint the world with this simple remedy.—G. W. DEVIN, Ottumwa, Iowa, July 15, 1893.

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August 1, 1893,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

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