

use of his book to others than expert chemists, yet we should consider the work a most useful laboratory companion, often giving valuable hints toward a more elaborate method than the one prescribed.

TEN THOUSAND MILES ON A BICYCLE. By Karl Kron. New York, 1887. (Published by author.) Pp. cvii., 800.

Our best recommendation of this work is to say that we find it very hard to convey any idea of its variety to a short notice. The author has conveyed so much of his very marked and interesting personality into every page, his reading and notes and views of men and things crop out so profusely, the interest never flags. Though ostensibly devoted to an account of ten thousand miles made on his 'cycle, "No. 234," it is an olla podrida of endless variety. The matter contained cannot be estimated by the number of pages. The small and exceedingly clear type makes it contain the substance of three or four volumes of respectable size. His accidents with his machine, from his first ride of one rod, resulting in a broken elbow and damaged machine, the cost of which ride he puts at \$234, to the entanglement with a tow rope on the canal path and the runaway of the mules with the 'cycle, are all graphically told and described at length. Chapters on other long-distance riders, a list of his original 3,000 subscribers to the book (copartners he calls them), and a variety of other matter are included. Those who enjoy thoroughly characteristic books will appreciate the one under review. Exhaustive indexes of persons and things are contained also.

TORNADOES: WHAT THEY ARE AND HOW TO OBSERVE THEM, WITH SUGGESTIONS FOR THE PROTECTION OF LIFE AND PROPERTY. By John P. Finley, U. S. A. New York: The Insurance Monitor. Pp. 196. \$1.

The author, a lieutenant in the signal corps, gives us the result of years' study and observation of this class of storms, in a sketchy and narrative form, with compilations of data from the Signal Service reports, and many illustrations, a considerable number of which are reproductions of views taken by instantaneous photography. The peculiarities of some of the most memorable tornadoes are noticed, on the testimony of eye witnesses, and their destructive effects are shown by several views of the ruin they caused. A chart showing the average distribution of these storms over the United States for many years gives, as the location of their greatest frequency, a district on either side of the Missouri River, from Omaha to Kansas City, embracing portions of Iowa, Nebraska, Kansas, and Missouri. A small section just east of the southern end of Lake Michigan has also been very frequently visited, as has also a larger area in northern Georgia and Alabama, and western South and North Carolina, while in Virginia, West Virginia, and Kentucky such visitations have been quite infrequent.

\* \* Any of the above books may be purchased through this office. Send for new catalogue just published. Address Munn & Co., 361 Broadway, N. Y.

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.

(1) M. P. R. writes: I have played on a flat cornet over a year, and I have had considerable trouble with my lips, especially when playing high notes; they seem to be very soft instead of being hard, which they should be. What will harden them? A. Try aromatic wine, which you can purchase from any druggist. The preparation is made as follows: Take of rue, sage, hyssop, lavender, absinth, rose leaves, thyme, and elder flowers, of each, 4 ounces. Digest for two weeks in 9 pints of claret. Then add tannic acid, alum, and wine of opium, of each 9 ounces.

(2) F. W. asks how to stop out pin holes in a negative. A. Touch them out with a soft lead pencil, such as is employed by retouchers. Formula for a toning solution giving dark tones is as follows: Chloride of gold..... 1 grain. Sodium carbonate..... 10 grains. Water..... 10 ounces. Use immediately after mixing.

(3) L. F. D. asks (1) what Strassburg turpentine is. A. Strassburg turpentine is made of European silver fir; it is much used in Germany, and any large druggist should be able to get it for you. 2. A good receipt to make an imitation of the imported gin. A. Dissolve 3 1/2 drachms oil of juniper in sufficient 95 per cent alcohol to make a clear liquid; add to it 40 gallons French spirits 10 above proof, with 8 ounces orange peel flavoring, 1 quart sirup, and 30 drops oil of sweet fennel. Brant on Distillation gives many recipes and directions for making gins, etc. We mail it for \$2.50.

(4) F. W. B. asks: How many pint cells of the plange battery described in SCIENTIFIC AMERICAN of August 20, 1887, page 116, connected in series, will run an Edison 1 candle power incandescent lamp? A. Four cells would run a one candle lamp brilliantly. 2. And about what is the electromotive force in volts of each cell when connected in series? A. Each cell has an electromotive force of 1.90 volts when freshly charged.

(5) J. J. R.—Make red copper or royal copper by boiling the articles in a nitric acid pickle (nitric acid and water). It is not unusual to have insulated material, that is, a conductor, or capable of receiving electricity, electrified by induction during a thunder storm, or if connected to the earth through water pipes, gas pipes, etc., to become charged with the opposite electrical conditions from the thunder cloud.

(6) J. B. H. asks: By what chemical reaction do the fumes of burning sulphur bleach apricots in drying? A. SO2 + H2O = H2SO3 + 2H. The nascent hydrogen combines with the coloring matter, reducing it to a colorless compound.

(7) E. Mc. L. writes: Our brick house sweats and destroys the paper on the walls. What is the best remedy or best finish to use in such cases? A. Brush the wall over with a hot solution of 1/4 pound of castile soap in 1 gallon of water; let it dry for twenty-four hours and then apply a solution of 1/2 pound of alum in 4 gallons of water.

(8) P. R. writes: 1. Please give me directions for amalgamating zinc plates for use in Smee batteries. I have an amalgamating solution that I made according to directions that I saw in a catalogue of electrical goods, but I think there is something wrong with it, for after plunging the plates (5x1 1/2x 1/8 inch) in it till the mercury will flow about on the surface, they will not last in a Smee or Bunsen battery on open circuit. They very soon become covered with a thick coating of a black substance, and waste away very rapidly. Will you please tell me why this is, and also whether or not they can be so treated that they will not corrode in sulphuric acid diluted with ten or fifteen parts by weight of water? A. We think the trouble is with your zinc. It is probably quite impure. Try immersing the lower ends of the zincs in a cup containing a small quantity of metallic mercury. The cup should be left in the battery cell to continuously maintain the amalgamation. Amalgamated plates on open circuit are apt to give more trouble. Short circuiting for a while will often improve them. 2. Also what is an "infernal machine"? A. An infernal machine is a device containing an explosive or highly combustible substance, and provided with a time exploder or igniter. 3. What is the cause of the beautiful play of colors in mother of pearl? A. The phenomenon is known as diffraction. It is the decomposition of the light by extremely minute grooves in the surface of the pearl.

(9) F. B. asks: 1. Can you give me a recipe for a good bichromate battery solution? A. Mix 100 parts of water with 12 to 20 of bichromate of potash in fine powder. Slowly add with constant stirring 25 parts of oil of vitriol. If you pulverize the bichromate, you should tie a cloth over your mouth and nose, as the dust if inhaled may produce ulcers. 2. How can I make a mould for casting battery zincs? A. Cast battery zincs in plaster of Paris moulds, or simply in clay, using a model of wood around which to form the mould. 3. How far apart should the zincs and carbons be in a bichromate battery? A. About 1/4 to 1/2 inch. 4. Will placing a carbon on each side of a zinc, or zinc on each side of a carbon, give twice the current that a single zinc and carbon produces? A. It greatly reduces the resistance, which varies to a great extent in proportion to the areas of the plates that face each other. This improves the efficiency.

(10) W. C. C. asks: 1. State how invisible pictures on glass are made, those that are brought out by breathing on the glass. A. The design is drawn by etching slightly with hydrofluoric acid. See SUPPLEMENT, No. 373, for illustration and description of the process. 2. Is there a preparation of French chalk used in the process? A. Drawing with soapstone or French chalk forms an alternative way of making the design. 3. Can compound be put on with rubber stamp? A. You might experiment with rubber stamp. 4. Please give receipt for making a perfectly white slip, that will melt at low temperature, such as in tile kilns, etc. A. Take 3 1/2 parts flint, 3 borax calcined, 1 Cornish stone, 1/2 oxide of tin. 5. Do you think the following storage battery will work? If so, how much current will be produced after storage? Lead shot in fiat porous cell forming the negative pole and oxide of lead in same kind of cell for positive pole, in a weak solution of sulphuric acid cells, 4x7 inches, containing one pound each, all inclosed in wooden box. A. The resistance of your battery will be too high.

(11) S. B. S. wants (1) a good and easy recipe for making Seidlitz powders in small quantities. A. The proportions are as follows: Rochelle salts 2 drachms, soda bicarbonate 2 scruples put these into a blue paper and thirty-five grains tartaric acid in a white paper. 2. A recipe for making wax tapers. A. Wax alone being too brittle, the composition used is wax 8 parts, white resin 4 parts, tallow 2 parts, turpentine 2 parts. Description of process of making is too long to give here; you will find it in the "Techno-Chemical Receipt Book," page 388, which we can send you postpaid for \$2.00. 3. A good recipe for making a stove polish. A. Mix 2 parts coppers, 1 of bone black, 1 of black lead, with sufficient water to make a paste. 4. How to make the tooth wash called sozodont? A. Take of potassium carbonate 1/2 ounce, honey 4 ounces, alcohol 2 ounces, water 10 ounces, oil of wintergreen and oil of rose sufficient to perfume. 5. A recipe for making a plaster good for drawing, healing, and strengthening purposes? A. Consult the U. S. Dispensatory. It contains recipes for many varieties of plasters.

(12) J. M. B. asks whether there is any way of tempering or hardening a saw smithing anvil, one that has been through a fire. A. If it has not been injured by being too long in the fire, so as to change the character of the steel by what is called burning, it can be rehardened; but it requires the experience of a person used to hardening. A good blacksmith should be able to do it.

(13) H. F. writes: I have a German silver protractor 5 inches in diameter, graduated to 1/2 degrees, but the lines are so fine that I can scarcely see them. Is there anything I can do to make them more clear? A. Make a little paste of lampblack, boiled linseed oil, and turpentine, and rub it across the lines with the finger, wiping off the excess from the surface.

Or substitute vermilion for the lamp black, so as to get red divisions. If they are only fine and already filled with black, we can only advise a low-power magnifying glass.

(14) A. R. asks the medical use of milk in hydrophobia. It has been said that if dogs have plenty of new milk, they will not have the hydrophobia. Is this the truth? A. We cannot indorse the use of milk for rabies in dogs. The best thing to do is to kill the dog immediately, when symptoms of the disease manifest themselves. You will find interesting articles on this subject in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 63, 87, 125, 128, 137, 230, 276, 352, and 468. 2. The medical use of some of our vegetables. A. For the medicinal properties of vegetables you must consult some physician and works on materia medica. Their action varies with the temperament of different individuals.

(15) C. B. asks: What cheap article should I use to harden a body of plaster of Paris? A. Mix with alum water.

(16) T. D. desires (1) a recipe for curing deer skins so as to make them durable and pliant like soft leather. A. Wash the skin in warm water, and remove all fleshy matter from the inner surface; then clean the wool with soft soap and wash clean. When the skin is perfectly free from all fatty and oily matter, apply the following mixture to the flesh side: Common salt and ground alum 1/4 pound each and 1/2 ounce borax. Dissolve the whole in 1 quart hot water and sufficiently cool to bear the hands; add rye meal to make it into a thick paste, which spread on the flesh side of the skin. Fold it lengthwise, the skin being quite moist, and let it remain for two weeks in an airy and shady place; then remove the past, from the surface, wash and dry. When nearly dry, scrape the flesh side of the skin with a crescent-shaped knife. 2. Tell me whether a panther skin can be cured and the hair left on? A. Yes; you may try the same as the above, or simply roll up with salt and alum rubbed well into the flesh side. Care must be taken to clean off all flesh and fat, and the skin needs to be well pulled and worked by a smooth and blunt tool.

(17) H. S. S. writes: A well is 700 feet from a house; the land at the well is 25 feet higher than at the house. The well is 35 feet deep. Now, with the pump (common force pump) can water be taken from the well to the house, the pump being at the house? A. It can. 2. Can ice be made on a small scale inexpensively? How? A. No. It requires an expensive machine. 3. How can drinking water be kept cool in warm climates? A. By placing it in unglazed pots, or in vessels wrapped in wet cloths, in a shaded place exposed to the wind. The evaporation of the exuding moisture cools the water, as practiced in Egypt and the Indies. 4. How can I take ink stains out of linen? A. Use a mixture of 2 parts cream of tartar, 1 part alum; pulverize together and make a strong solution in water, saturate the stain for a few minutes and wash. If not entirely removed, a weak solution of oxalic acid may be applied for a minute, and wash.

(18) L. W. asks a receipt to make Worcestershire sauce. A. Mix together 1 1/2 gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, 1/2 gallon Madeira wine, 1/2 gallon Canton soy, 2 1/2 gallons moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1 1/2 ounces chutney, 3/4 ounce each of cloves, mace, and cinnamon, and 6 1/2 drachms asafoetida dissolved in 1 pint brandy, 20 above proof. Boil 2 pounds hog's liver in 1 gallon of water, adding water as required to keep up the quantity, then mix the boiled liver thoroughly with the water, strain through a sieve, and add this to the sauce.

(19) E. A. L. asks whether borax, and also whether the silicates of sodium and potassium, when fused, are decomposed by an electric current of not more than 30 volts pressure. What compound substances (if any) resist, when fused, a current of above strength? A. An electric current of 20 volts potential will decompose any chemical compound under proper conditions.

(20) B. F. M. asks: What facing must be used in moulding brass in order that the castings shall be bright brass color when made? A. Use pulverized charcoal. There is an art in producing bright color in brass castings, independent of the method of moulding. It consists partly in timing the opening of the moulds and quickly cooling the castings in water before they have time to oxidize.

(21) H. E. D. asks: With what size wire should the armature in eight light dynamo (SUPPLEMENT, No. 600) be wound for plating, and how should the machine be arranged? A. Wind field with No. 8 wire until full and armature with two layers No. 12 wire. Arrange in series.

(22) R. O. desires (1) the best receipts for stove blacking. A. Take 2 parts coppers, 1 part bone black, one of black lead, with sufficient water to make a creamy paste. 2. For stove pipe varnish. A. Take of asphaltum 2 pounds, boiled linseed oil 1 pint, oil of turpentine 2 quarts. Fuse the asphaltum in an iron pot, boil the linseed oil and add while hot, stir well and remove from the fire. When partially cooled, add the oil of turpentine. Some makers add driers.

(23) J. C. S. asks the formula for computing the horse power of ordinary cylindrical steam boilers. A. The nominal horse power of boilers is the effective fire surface in square feet, divided by 12 for large boilers (over 30 horse power) and 14 for small boilers. The effective surface is all the shell exposed to the fire or heat and two-thirds of the tube surface on the fire side.

(24) J. G. Y. S. desires (1) the most practical and economical proceeding for taking away the smell, taste, and color from olive oil. A. Add bone or blood charcoal in powder, shake well and filter. 2. A receipt that is practical and economical for making black varnish for machinery and stoves. A. See answer to No. 22.

(25) J. McN. asks how many cells of Fuller's mercury bichromate of potassium battery will be required to operate a circuit of about two hundred feet which has on three bells of high resistance, eight

ohms each I think, and a clock arranged to open and close the circuit, also how much the battery should be increased to operate five bells. A. Five cells would suffice for the first case and eight for thesecond. Owing to the high resistance of the bells, more battery would be advantageous.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

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