

ject for themselves. The experiments which form the central part of the book are carried out with the simplest possible apparatus. Although the main purpose of the book is to set forth the purely scientific aspects of electro-chemistry, the practical side of the subject has not been left altogether unknown. Technical electro-chemical processes, especially the processes of electro-metallurgy, which is so important at present, are referred to in their proper places. It is a work of great value to all professors and students of chemistry.

Woodworkers' Tools (400 pages, price \$1), by Charles A. Strelinger & Company, of Detroit, Mich., is a good deal more than an ordinary catalogue; for, in addition to its numerous illustrations of tools and machinery, it gives a great deal and a wide variety of practical information relative to their employment, well calculated to assist the workman or apprentice. It includes tools used by carpenters, builders, cabinet makers, pattern makers, millwrights, carvers, and ship carpenters, as well as implements for draughtsmen, etc. A supplementary chapter is designed to place before the practical mechanic simple illustrations of the first principles of geometry.

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AUGUST, 1897.—(No. 142.)

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No. 2. A cottage at Scranton, Pa., recently erected for Mr. E. Healy, at a cost of \$7,000 complete. Perspective elevation and floor plans. A modern design well treated. Mr. Edward H. Davis, architect, Scranton, Pa.
No. 3. A residence at Prohibition Park, S. I., recently erected for Mr. J. W. Hoban, at a cost of \$3,300 complete. Excellent design of modern American style, with Colonial treatment and detail. Mr. John Winans, architect and builder, Prohibition Park, S. I. Two perspective elevations and floor plans.
No. 4. A suburban school house at Overbrook, Pa., designed to resemble a private residence instead of a public building. An exceedingly attractive design. Mr. William L. Price, architect, Philadelphia, Pa. Two perspective elevations and floor plans.
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No. 13. Miscellaneous Contents: Palais Royal to be demolished.—Largest hotel on earth.—A quick piece of work.—Drawing materials, surveyors' instruments, etc.—Statue of Mercury at the Nashville Exposition, illustrated.—Compo-board.—Improved heaters and furnaces, illustrated.—Stair builders' goods.—Architects' and builders' directory.
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Business and Personal.

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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.
Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
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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.

(7189) E. G. A. asks: Please say in what number of your paper I can find instructions for making a kite without a tail. A. Valuable illustrated articles on the construction and flying of tailless kites will be found in SCIENTIFIC AMERICAN, Nos. 20, vol. 55; 12, vol. 53; 10, vol. 70; 11, vol. 71; 11, vol. 74; 4, vol. 76; also SUPPLEMENT, Nos. 583, 1013, 1016, 1070. Price 10 cents each prepaid by mail.

(7190) W. H. asks: 1. In making the eightlight dynamo described in SUPPLEMENT, No. 600, could not the armature core be built of thin disks of iron, extending to the shaft, or could the wooden sleeve be replaced by one of brass? A. The armature core may be built of disks of the softest sheet iron about one-twentieth inch in thickness. These are sometimes perforated for ventilation. The disks are to be separated from each other by similar disks of thin paper or they may be oxidized. This prevents eddy currents through core. They may be keyed to the shaft or fastened together by bolts. No metal other than iron should be used in core, since iron alone has magnetic value. 2. Has an alternating current P. and N. poles? It seems to me, if the current were rapidly reversed, there would be no poles. A. The poles reverse two or more times with every revolution of the alternating dynamo, and no effort is made to name them. 3. What is meant by consequent and salient poles? A. Consequent poles are poles formed in the length of a magnet, and alternating in sign. In field magnets, salient poles are those projecting from the main body of the field magnet.

(7191) D. K. writes: I wish to light a 6 candle power 9 to 12 volt lamp for about 4 hours per night. I have 6 storage cells of 5 plates each, plates 6x8 inches. 1. How many Grove, Bunsen or Daniell batteries would it take to charge the above? A. Use 15 Daniell or gravity cells, or 10 Grove or Bunsen. 2. Which of the above batteries is the most suitable? A. Daniell or gravity. The others both give off corrosive vapors and must be kept out of doors or in a box outside of a window. 3. Would smaller plates in the storage battery be better? A. If the cells are of any of the standard makes, they could be cut down to about half the original size. To determine this, remove one pair of plates from each cell and find the amperes the battery will give as compared with full size. Then cut down the plates proportionally.

(7192) J. J. R. asks: 1. What does a dry battery consist of? How is it made up? Give me all the facts and what powders to use to bring out the electric spark. This must be a dry battery and a small one. Give me the cost of its make up. A. There are no dry cells, that is, cells containing only dry powders. The so-called dry cells are usually Leclanche cells in type. They are made with a rod or strip of zinc and a plate or cylinder of carbon. These are immersed in a paste composed of a saturated solution of sal ammoniac in water, into which plaster of Paris, gelatine, or some other substance is stirred till the liquid is held so that it will not run out if the cell is upset. In a sense it is dry. The cost depends on size, materials and make-up. It is not possible to give figures. See a valuable paper on dry cells in SCIENTIFIC AMERICAN SUPPLEMENT, No. 1001, 10 cents. 2. Also give me a few principles of how to deal with pyro-electricity of certain minerals possessed with the electric heat and form a brush glow spark. A. There are

no minerals which give out electric heat and a glow spark with pyro-electricity. Tourmaline, boracite, and other minerals may be electrified by heating so as to attract light bodies to their ends, in a manner similar to rubbed sealing wax. Mica will glow in the dark on being suddenly split, and a lump of sugar will do the same on being crushed or cracked. A piece of card will give out sparks on being torn asunder in the dark. See S. P. Thompson's "Lessons in Electricity," Pp. 77-80. 3. Also if magnesium wire can be used possessed of heat, and can be controlled. A. Magnesium ribbon is burned in a lamp invented for that purpose, with full control. Apply to some dealer in physical apparatus.

(7193) A. J. C. asks for a recipe for making white metal. A. White metal is made by a number of formulas. It depends upon the use to which it is to be put. Try the following: Tin, 9 ounces; lead, 2 ounces; antimony, 1 ounce; bismuth, 2 ounces.

(7194) R. H. D. asks: How can I fasten cloth to brass or zinc? A. Use equal parts of pitch and gutta percha melted together and used hot. The following formula has also been recommended for the purpose: Gutta percha, 16 parts; pure, unvulcanized rubber, 4 parts; pitch, 2 parts; shellac, 1 part; linseed oil, 2 parts. Digest the rubber in the linseed oil; melt the gutta percha, pitch and shellac and add the digested rubber.

(7195) E. A. B. says: Please answer the following in your query column: In using a Baume hydrometer for acids at 60° F. in a diluted solution of 2 or 3 per cent acid, what is the variation of the hydrometer reading when the thermometer reading in the solution is over 60° up to 80° or 90°, for instance? A. The small amount of acid in solution 2 or 3 per cent will change the density of the water very little. The density of a 5 per cent solution in pure water is 1.033. Hence the change of hydrometer reading is practically that which is produced by change of temperature, and this is very little for a change from 60° to 80°. Not as much as 1 on Baume's scale. The temperature was not considered in making the Baume scale. You can easily determine the matter experimentally. Bring your liquid below 60° and heat it very slowly, stirring to keep it uniform in temperature throughout. Observe both thermometer and hydrometer and record the readings of hydrometer for temperatures from 60° to 80°, or, in fact, as high as you need in your work. You will then have a table of corrections for your hydrometer.

(7196) N. E. S. asks: Will you please publish in "Answers to Queries" in SCIENTIFIC AMERICAN, the formula for making the hectograph? I have been a reader of this valuable publication for over three years past. I have noticed this formula in one of my papers, I think, but, as some of my papers were accidentally destroyed, I lost the formula. A. Formulas for hectograph compositions are given in our SUPPLEMENT numbers 438, 1092 and 1110, which we can supply at 10 cents each.

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An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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