

that of the purely technical portions. A list of the cuts would be an improvement. As far as we have gone, we find in it no illustration of the entire building except in the way of plans, something which certainly seems to be a very curious omission, the illustrations generally referring to details of construction.

JAHRBUCH FUR PHOTOGRAPHIE UND REPRODUKTIONSTECHNIK FUR DAS JAHR 1894. By Dr. Josef Maria Eder. 8th volume. Halle a. d. Saale, Germany: Wilhelm Knapp. 147 illustrations and 34 artistic plates. Pp. 551. Price \$3.

The eighth volume of yearly review for photography and reproductions is, like its predecessors, divided into 81 original articles by the most eminent writers and into statistical notes on the progress of photography during the years 1892 and 1893. The original articles cover all branches of the photographic art, and very noteworthy among the same are the progress of chromophotography, by Niewenglowski, Paris; compounded heliography, by Ives, Philadelphia; astrophotography in 1893, by Dr. R. Spitaler, observatory, Prague; progress in micrography, by Marktanner, Turnerscher-Graz, Austria. The plates represent all forms of photographs and reproductions in every branch of the art of reproducing pictures.

PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON AERIAL NAVIGATION HELD IN CHICAGO, AUGUST 1, 2, 3, AND 4, 1893. The American Engineer and Railroad Journal. 1894. Pp. iv, 429. Price \$2.50.

Aerial navigation within the last few years has taken on a new aspect. It is now being studied by some of the best minds in the inventive and scientific field, and artificial flight, to a certain extent, has actually been accomplished. The present work is of deep interest, including a large number of papers on the subject giving scientific calculations applied to aeroplane and other movements. Professor Langley's classical paper on the internal work of the air, and any quantity of other valuable material, is embodied in the four hundred and odd pages of fine type in this book. The index, although of over fifteen pages fine type, might readily have been extended to two or three times this size.

METEOROLOGY, WEATHER, AND METHODS OF FORECASTING. With a description of meteorological instruments, and river flood predictions in the United States. By Thomas Russell, United States Assistant Engineer. New York: Macmillan & Company. 1895. Pp. 277 and a series of weather maps. Price \$4.

This is a very complete work, whose contents are based on the practice of the United States weather service in the prediction of coming changes, by the study of the weather maps of present and past atmospheric conditions. The flood conditions of rivers due to the varying rainfall of their drainage areas are also a most interesting feature.

ELECTRICAL BOATS AND NAVIGATION. By Thomas Commerford Martin and Joseph Sachs. New York: C. C. Shelly. 1894. Pp. vi, 224. Price \$2.50.

This very convenient manual treats of a subject in which there is a great deal of inquiry at the present time, and which inquiry would seem to predicate a large circulation. It treats of various motors and of the general disposition of parts in electric boats in general and of all kinds, of the propulsion of canal boats, as well as of smaller craft; the canal boats, of course, being operated by a trolley system. In the wording of the book we notice one inaccuracy in the reference to a "110 volt current," instead of a "110 volt circuit," an example of an error in expression which is suffering a lingering death. An interesting feature which is produced is the fact that, with ordinary launch hulls, the average battery load conveniently represents about one-third of the total actual displacement in tons, including the passenger load (p. 95).

LESSONS IN THE NEW GEOGRAPHY FOR STUDENT AND TEACHER. By Spencer Trotter. Boston: D. C. Heath & Company. 1895. Pp. v, 182. Price \$1.

There are so many new things now that the "new geography" reads naturally enough. It seems that the new science practically dispenses with maps, as exceedingly few, and those of altogether subordinate importance as regards political divisions, are contained in the book, which, in general, corresponds to what used to be called physical geography. It is written so as to make consecutive readings. That it is written by a biologist is evidenced by the treatment of the subject, even as outlined in the Table of Contents.

LENS WORK FOR AMATEURS. By Henry Orford. With 231 illustrations. London and New York: Whittaker & Company. Pp. xv, 225. Price 80 cents.

The manufacture of lenses is one of the most interesting kinds of work for an amateur. This book treats fully of the subject, and with numerous illustrations gives the manipulation in considerable detail. The author is not content with lens work proper, but writes also of the manufacture of prisms and the production of different angles thereon. Even if one does not intend to make lenses, the details of the practice will be found interesting reading.

GARDEN AND FOREST. A journal of horticulture, landscape art, and forestry. Conducted by Charles S. Sargent. Illustrated. Volume VII. January to December, 1894. New York: The Garden and Forest Publishing Company. 1894. Pp. ix, 520.

The bound volume of this journal for the year just passed forms an admirable manual for gardeners and others interested in plants. Its distinguished editor, Professor Sargent, of Harvard College, is a sufficient guarantee in himself for the excellence of the matter. Among the

articles we notice one series of especial interest, entitled "Notes for Mushroom Eaters," a series running through six numbers and which, with the numerous illustrations, forms an excellent manual for those fond of the edible fungi. These articles are signed by their author, Professor W. G. Farlow, of Harvard College, and it is to be wished that, with due enlargement, they might be put into book form, the subject being an almost inexhaustible one. The other illustrations in the work, some in half tones and some in engraving, are most interesting and practical.

THE PROBLEM OF CIVILIZATION SOLVED. By Mrs. Mary Elizabeth Lease. Chicago: Laird & Lee. Pp. 377. Price 50 cents.

SOMETHING ABOUT ELECTRIC BELLS. By J. A. de la Vergne, Jr. Clinton, Missouri. 1894. Illustrated. Pp. 23. Price 25 cents.

Goodnow & Wightman, No. 63 Sudbury Street, Boston, have issued a new edition of their catalogue which they will forward to any address on request. They have a large assortment of tools, materials and parts of models, brass castings for gears, etc., and their catalogue covers a great deal that few dealers carry in stock, and is particularly suited for machinists, pattern makers, model makers, amateurs, physical and mechanical departments of colleges, etc.

SCIENTIFIC AMERICAN BUILDING EDITION.

FEBRUARY, 1895.—(No. 112.)

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1. Elegant plate in colors, showing an artist's home at Bronxwood Park, N. Y. Perspective elevation and floor plan. Cost complete \$3,300. Mr. A. F. Leicht, architect, New York City. A unique design.
2. A residence at East Orange, N. J., recently completed for Geo. R. Howe, Esq. Two perspective elevations and floor plans. A pleasing design. Mr. Jas. H. Lindsley, architect, Newark, N. J.
3. A cottage at Glen Summit, Pa., erected for H. H. Harvey, Esq. Two perspective elevations and floor plans. A handsome summer cottage with some novel architectural features. Messrs. Neuer & Darcy, architects, Wilkesbarre, Pa.
4. A residence at Forest Park, Springfield, Mass. Two perspective elevations and floor plans. A combination of the Colonial style with French chateau features. Mr. Louis F. Newman, architect, Springfield, Mass.
5. "Sunnyside." The residence of Robt. S. Walker, Esq., at Flatbush, L. I. Three perspective elevations and floor plans. An exquisite design. Mr. Frank Freeman, architect, New York City.
6. A picturesque and well appointed residence erected for the late E. E. Denniston, Esq., at School Lane, Pa. Cost complete \$22,000. Perspective elevation and floor plans. Mr. Geo. T. Pearson, architect, Philadelphia, Pa.
7. A residence at Nutley, N. J., recently erected at a cost of \$5,800. Perspective elevation and floor plans. Mr. E. R. Tilton, architect and designer, New York City.
8. A cottage in the Colonial style at Southampton, L. I. Two perspectives and floor plans. Mr. C. H. Skidmore, architect.
9. Hall and Library at Glen Ridge, N. J., erected at a cost of about \$12,000. Mr. Wilbur S. Knowles, architect, New York City. Perspective view and floor plans.
10. A dwelling in the Colonial style at South Orange, N. J. Cost complete \$6,500. Mr. P. C. Van Nuys, architect, Newark, N. J. Two perspective elevations and floor plans.
11. Two views showing a most successful alteration in the Colonial style of the Blinn homestead at Cambridge, N. Y. One view showing the original structure as built over one hundred years ago and the other showing the additions and changes recently made. Mr. H. Inman Furlong, architect, New York City. Perspective views and floor plans.
12. A cottage in the Colonial style at Cushing's Island, Me., erected for Francis Cushing, Esq. Two perspective elevations and floor plans. Cost complete \$2,000. Mr. John C. Stevens, architect, Portland, Me. A unique and picturesque design for a model summer home.
13. A Colonial house at Westgate, Conn., being erected for the summer residence of Arthur M. Dodge, New York City. Perspective view and floor plans. Messrs. Child & De Goll, architects, New York.
14. Miscellaneous contents.—Improved method of manufacturing hydraulic cement.—A complete Pompeian house.—Inventions reduce the cost of building.—Those dreaded draughts. How they are caused and avoided in window-tight rooms.—Fire proof buildings.—The great staircase in the Capitol Building at Albany, N. Y.—Porous glass for windows.—Mexican onyx.—The Manhattan Life Building, New York.—View showing the waterproofing of the walls by the Caffall process.—A traveling lawn sprinkler, illustrated.—Egyptian cement plaster.—Ornamenting glass.—A bridge of concrete.—A new model parlor door hanger, illustrated.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

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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. 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.

(6433) F. B. says: 1. What toilet perfumes are partially protective against influenza and fever contagion? A. Try aromatic vinegar, made as follows: Dried leaves of rosemary, rue, wormwood, sage, mint, and lavender flowers, each ½ ounce; bruised nutmeg, cloves, angelica root, and camphor, each ¼ ounce; alcohol, rectified, 4 ounces; concentrated acetic acid, 16 ounces; macerate the materials for a day in the spirit; then add the acid and digest for a week longer at a temperature of 14° or 15° C. Finally press out the now aromatized acid and filter it. 2. What process in multiplying copies of tracings and details of machinery gives a black line on white ground? A. See the valuable article on heliography, or the actinic copying of drawings and engravings, 12 different methods, in SUPPLEMENT, No. 584.

(6434) F. L. says: Will you kindly tell how to make Lea & Perrin's Worcestershire sauce? A. This is quite a complex condiment. It is made of wine vinegar, 1½ gallon; walnut catsup, 1 gallon; mushroom catsup, 1 gallon; Madeira wine, ½ gallon; Canton soy, ½ gallon; moist sugar, 2½ pounds; salt, 19 ounces; powdered capsicum, 3 ounces; pimento, 1½ ounce; coriander, 1½ ounce; chetney, 1½ ounce; cloves, ¾ ounce; mace, ¾ ounce; cinnamon, ¾ ounce; asafoetida, 6½ drachms; dissolve in 1 pint brandy 20° above proof. Boil 2 pounds hog's liver for 12 hours in 1 gallon of water, add water continually so as to keep up the quantity of 1 gallon; mix the boiled liver thoroughly with the water, strain through a coarse sieve, and add this to the above mixture. It is self-evident that no chemical examination could ever detect the presence of half the above organic products.

(6435) J. M. asks: 1. What is the difference between a single view lens and a rapid rectilinear lens? A. A single view lens makes a picture distorted more or less toward the edges, and to secure good definition a small diaphragm is needed. In a rectilinear lens it is possible to make corrections which avoid the distortion and permit of the use of a larger diaphragm, thus allowing more light to pass. 2. What is single swing and double swing as applied to cameras? A. Swing backs are applied to cameras to permit of tilting the camera to bring the plate parallel with principal vertical plane of the picture, to obtain a view without distortion. The double swing is applied to permit of swinging the plate in two planes. 3. What size lens should I use to take an ordinary cabinet portrait? A. Use a 4¼x6½ lens. 4. How could I prepare dry plates? A. Buy your dry plates; they are very difficult to prepare. The process is described in SUPPLEMENT, No. 541. 5. Is perspiration weakening? A. Excessive perspiration is weakening.

(6436) G. R. R. asks: 1. I have three Mesco dry batteries that are partly exhausted. I have plenty of sheet zinc for cups. Will you please tell me what to fill with? A. For dry batteries we refer you to our SUPPLEMENT, Nos. 157, 767, 792. 2. Also two Gonda prism Leclanche batteries, and do nothing with them. Have worked prisms in warm water, used new solution and zincs, but get only a faint current. What can I do to improve them? I want to use them for a microphone. A. You need new prisms. By soaking the old ones in solution of potassium permanganate, you can get something out of them. 3. Will electric light carbon pencils do for a Hunning transmitter, if pulver-

ized? A. Yes; polish by shaking with best quality of plumbago. 4. I have 12 cells of plunger battery 1½x3. Can I get a current strong enough to magnetize steel for a compound telephone magnet with 1¼ pounds of No. 18 cotton-covered magnet wire? A. Yes. 5. How are the magnets made in the compound watch style receiver like the National, of Boston? A. German steel is often used for telephone magnets. We have no information concerning the special telephone you mention. 6. Could the core of an induction coil be used as a receiver with the secondary coil in the line, same as connected in the transmitter? A. It is very questionable if you would get working results. 7. What is the most practical for a Hunning transmitter, graphite or pulverized carbon? A. Try method of query 3.

(6437) M. A. asks: 1. Does it make any difference in the strength of an electro-magnet whether the form of the cross section is different, provided the area and the length is the same and both are wound with the same amount of wire for instance; the area of each cross section of two electro-magnets is 16 square inches; one is 2 inches by 8 inches and the other 4 inches by 4 inches. A. The shape of cross section will slightly affect the leakage, but not enough to amount to anything. The shape of the polar ends has a very great effect on the tractive power. 2. With what size wire should I wind the simple electric motor for 4 amperes and what voltage will it then require to develop ½ horse power? A. For 4 amperes use No. 17 wire; give it 8 volts. We advise you not to change the winding. You cannot get ½ horse power out of it. 3. How many watts should a highly efficient motor of the same power require? A. 100 watts.

(6438) J. E. D. asks: 1. What kind of gas is the most powerful for lifting purposes, and what weight will 1,000 cubic feet of such gas lift? A. Hydrogen; 70 pounds if pure. It is rarely in pure. 2. What is the lifting power of common illuminating gas per cubic foot? A. About 30 pounds per 1,000 cubic feet. 3. What is the average weight of a cubic foot of aluminum? A. 163 pounds.

(6439) H. A. B. writes: I have made a medical battery as follows: 2 layers of No. 18 cotton-covered copper wire for primary coil, 12 layers (1½ ounces) of No. 36 silk-covered copper wire for secondary coil and a bundle of No. 18 soft iron wire 7-16 inch in diameter for core, the whole being 2½ inches long. I do not get much of a shock with one cell of bichromate battery. Please state where I have made my mistake. Please give right proportion of all wire for a Faraday battery to obtain good results. A. We presume your secondary is too small. Our SUPPLEMENT, No. 569, describes a powerful medical induction coil.

(6440) J. B. asks: 1. How are dry plates for photographing made? A. See our SUPPLEMENT, Nos. 541, 647, 649 and 696. 2. What book do you recommend for beginner in electricity? A. For beginners in electricity we recommend and can supply Thompson's "Elementary Lessons in Electricity and Magnetism," price \$7.25; Ayrton's "Practical Electricity," price \$2.50; also Hopkins' "Experimental Science," price \$4 by mail. 3. Are magnetic lines of force of the same strength in all magnets or do they vary in strength with the size of the magnets? A. They are assumed to vary in number per given area. A line of force is a fixed unit. See SUPPLEMENT, Nos. 891, 895.

(6441) F. B. asks: 1. Could an electro magnet be made by taking two spools and putting on a turning lathe taking the wood off to within ¼ inch of the hole (going through the spool), and then wind with wire in the usual way, of course putting an iron core in the holes of the spools, having them joined together at one end? Would the ½ inch in thickness hinder the power of the magnet to any great extent? A. Yes; but the wood would be inferior to the same quantity of iron; otherwise it would be of no particular harm. 2. How many cells of Crowfoot gravity battery would it take to light a six candle power incandescent lamp? A. Twenty-four in series, eight in parallel—a total of nearly two hundred cells.

(6442) H. M. C. asks: 1. Is it necessary to use silk-covered wire in making induction coil in Blake transmitter? A. It is decidedly advisable to do so. 2. Will two layers of No. 24 on the primary and 10 layers of No. 36 on the secondary be right in making above? A. Wind the primary to ½ ohm resistance and the secondary to 80 ohms. 3. Will you give a good recipe for preparing the chalk as used on the chalk engraving plate? I have tried several processes and I fail in making it stick to the plate and prevent it from chipping. A. See our SUPPLEMENT, Nos. 720 and 790. Possibly the surface of your plate is too smooth or was greasy.

(6443) O. C. asks: Is there any heat produced by the pressure of a book lying on a table? A. No; the pressure of the book is force, not energy. In overcoming force no heat is produced; in overcoming energy, heat is often the result.

(6444) C. H. B. says: In compounding equal parts of pure distilled water and pure alcohol the original quantity is diminished, and the strength increases. Why is this? A. A very usual phenomenon of solution is represented in the above case. When liquids having an affinity for each other are mixed, there is generally a reduction of volume. It represents a change on the dividing line between physics and chemistry.

(6445) F. B. P. asks how to etch cutlery. A. For etching brands and marks on polished steel surfaces, such as saws, knife blades, and tools, where there are many pieces to be done alike, procure a rubber stamp with the required design made so that the letters and figures that are to be bitten by the acid shall be depressed in the stamp. Have a plain border around the design, large enough to allow a little border of common putty to be laid around the edge of the stamped design to receive the acid. For ink, use resin, lard oil, turpentine, and lampblack. To ¼ pound of resin put 1 teaspoonful lard oil; melt, and stir in a tablespoonful of lampblack; thoroughly mix, and add enough turpentine to make it of the consistency of printer's ink when cold. Use this on the stamp in the same manner as when