NEW BOOKS AND PUBLICATIONS.

QUALITATIVE ANALYSIS TABLES, AND THE REACTIONS OF CERTAIN ORGANIC SUBSTANCES. By E. A. Letts. Belfast: Bayne & Boyd. 1892. All rights reserved. Pp. 91.

This is one of those books with elaborate tables designed to lie upon the working table of the chemist or on his desk, to be referred to constantly. Its excellent and clear printing, its selection of subjects and its full index make it of particular value for this purpose.

THE PERFECT CALENDAR FOR EVERY YEAR OF THE CHRISTIAN ERA. By Henry Fitch. 1891. New York: Funk & Wagnalls Co. 8vo. Pp. 37. Price 50 cents.

Perpetual calendars are by no means new, but the present work appears to have solved the difficulty of furnishing a perfect perpetual calendar which is simple and intended for everyday use. With this little book all the difficulties of old style and new style are brushed away. A brief history of the calendar is annexed.

ANNUAL REPORT OF THE MINISTER OF PUBLIC WORKS FOR THE FISCAL YEAR 1890–91. Parts I and II. Ottawa. 1893. 8vo. Pp. 231, 419. Price 50 cents.

Canadian annual reports, Part II, contains the water levels of the river St. Lawrence between Quebec and Montreal. Illustrations to accompany Part II come in a separate volume, price 90 cents.

CYCLOPEDIC REVIEW OF CURRENT HISTORY. First quarter 1893. A. S. Johnson, A.M., Ph.D., editor. Buffalo: Garretson Cox & Co. 8vo. Pp. 214. Illustrated. Price 40 cents.

This is not a new publication, as it is numbered vol. 3, No. 1, but it has changed hands. The Review is intended to give a clear and dispassionate view of the events of contemporary history. Some of the headings are as follows: The Behring Sea dispute, the Hawaiian question, the reciprocity policy, U. S. politics, the merchant marine, cholera, necrology, disasters, silver question, etc.

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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 This is for our information and not for publication.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.

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.

(5286) L. R. B. asks: Could unused arc light carbons be used with advantage as positive poles of batteries? If so, how are they best arranged in cell and what solutions should be used? What would be the E. M. F. and resistance of such battery? A. The electric light carbons can be used as you suggest. If they are copper coated, the copper must be removed by means of nitric acid. The solution used in zinc carbon batteries is made by dissolving bichromate of soda in water, making a saturated solution, and slowly adding to this solution one-fifth of its bulk of commercial sulphuric acid. The zinc should be amalgamated.

(5287) J. B. T. asks: Will you kindly inform me through your paper where I can get some information about oxidizing silver or if you know of a good formula to be used for that purpose? A. Dip the clean silver article in a solution of sulphide of potassium (liver of sulphur), 2 drm. to a pint of water. Heat this solution to a temperature of 175° F. Immerse for a few seconds only, when the article becomes blue black. For a velvet black, dip the article, previous to oxidizing, in a solution of mercurous nitrate and water and rinse. Then dip in the sulphide solution as above. For a brown shade, oxidize in the potassium sulphide as above, then dip in a liquid composed of 10 parts blue vitriol and 5 parts sal ammoniac to 100 parts vinegar. After oxidation brush with a scratch brush very lightly, to brighten and variegate the surface.

(5288) B. L. Association writes: An electric lighting company contracts to light the streets of our city with arc lights of 2,000 standard candle power each. What is the standard candle of comparison, and how may we know, with reasonable accuracy, what power lights we are furnished with? Is any book published which gives full information in regard to the strength of lamps and lights as furnished by electric lighting companies, and method of measuring same? A. The candle power is nominal; 2,000 candle power really equals the light of about 800 sperm candles, each burning 120 grains per hour. Your contract should specify current and potential. We cannot recommend a book covering the precise ground which you specify.

(5289) J. C. C. writes: I have come across a number of open circuit batteries with the binding posts so corroded by the action of the solution as to make them useless. After the batteries have been charged, would it not be advantageous to put on top a tablespoonful of heavy oil, to stop the salt from keeping; or would this be injurious to the life of battery? A. Oil can be used as you describe. It has the objection of being dirty. It is a good plan to give a coating of paraffin to the upper half inch of the jar.

(5290) F. R. C. asks: 1. Will wooden cells, well lined with black pitch, about ⅛ in. thick, be durable for storage cells? A. The use of wooden cells is not advisable. With a proper mixture they can be made serviceable. It is doubtful if plain black pitch would answer. 2. What shall I use to seal the above cells? Also rubber and glass cells? A. The cells should not be sealed, as, in charging, gas is often evolved. They may be partly closed by any form of stopper; best of rubber.

(5291) H. J. S. asks for a formula of a composition or name of a substance which when placed in water will assume larger proportions, and when removed from same will not resume its original size, but remain compact and hard? A. Compressed soft wood, such as holly, answers your requirements.

(5292) P. S. asks: Will the motor described on page 497 in "Experimental Science" run the dynamo described on page 487? Will there be any gain in strength of current? A. With sufficient current the motor referred to will drive the dynamo, but there will be no gain in strength; on the contrary, there will be a loss of from 25 to 50 per cent.

(5293) J. J. S. writes: I run a small desk fan attached to a No. 1 Porter motor on the regular incandescent light wires. To prevent fuse melting it is necessary to put a lamp in the circuit, but the fan will only run with a 32 c. p. lamp, 1 or 2 16 c. p. lamps having no effect whatever. Can you give the reason for this, and also if I can run the fan without any lamp in the circuit? A. Without introducing some resistance in the circuit along with your motor, the motor takes an amount of current which is sufficient to heat and melt the fuse. Probably your motor is running very uneconomically. If it were wound with fine wire, so as to have a suitable resistance, it would take the requisite amount of current and run with much greater economy. It is important, in connecting up a motor in an electric circuit, to have the motor adapted to the current and electromotive force.

(5294) P. J. L. asks whether illuminating or fuel gas can be made from the action of sulphuric acid upon zinc, and its gas forced through a carburetor for a commercial value, and, if so, at about what cost? And further, does this make a better gas for illuminating purposes than air carbureted which contains no acid gas? A. The gas you describe cannot be made commercially, as it is very expensive. It makes a better gas than carbureted air.

(5295) E. J. M. asks at what time the ancient classification of four elements was made and by whom? A. Earth, air, fire, and water were elements enumerated by Empedocles. Ether was added to these as a fifth element. The division undoubtedly preceded Empedocles' time.

(5296) A. B. C. asks: 1. I inclose a sample of some mineral which is found near this town; it is found from four to six feet below the surface of the ground among gravel, and it is also found embedded in slate stone. I tried to melt some of it, but when it reached a dull red heat it took fire and burned with a blue flame and smelled very strong of sulphur. The flame does not last long, but it stays hot a long time. I also inclose a sample of stone resembling slate, which when broken smells like petroleum, and when heated gives off a gas which burns. Please tell me what they are. A. The mineral sent is iron pyrites in shale, of no value. 2. How much weight will a straight electro-magnet lift, the core of which is made of ¼ inch iron, 3 inches long, and wound with 4 layers of No. 18 double-wound wire, if a current of one volt E. M. F. is sent through it, the distance of the weight from the pole of the magnet being ⅛ of an inch? A. Your magnet might lift 2 ounces. A magnet of this form is not well adapted to lifting or sustaining weights; better use a magnet of horseshoe form. 3. Should the air be kept out of a sal-ammoniac battery? A. Sealing the battery prevents evaporation. If your battery has a porous cell, the sealing should be perforated to allow the escape of air on the entrance of the solution into the porous cell. 4. In making an electro-magnet what rule is there for finding the amount of wire required for a given size of iron? A. The common rule is to make the depth of the winding equal to the diameter of the core. 5. What is meant by ampere turns? A. An ampere turn is the equivalent of one ampere carried once around a magnet core; thus the passage once around the core of one ampere is an ampere turn, or 10 turns of a wire carrying one-tenth ampere is an ampere turn. 6. How many ohms are required to destroy the effects of one volt on a delicate galvanometer? A. It is doubtful if any amount of resistance would entirely destroy an E. M. F. of one volt. Much depends upon the sensitiveness of the galvanometer.

(5297) F. L. A. asks: 1. How to put the black finish on brass. A. The fine black finish on brass is made by dipping in a solution made of 5 drachms perchloride of iron dissolved in one pint of water. Also by rubbing the surface with chloride of platinum salt moistened. 2. What causes the alternate circles of light and dark under the electric light? A. The band shadows under the electric light are probably the effect of diffraction, possibly intensified by reflection from the inside of the globe. 3. Where can I buy Clerk Maxwell's work and what is the price? A. We mail J. Clerk Maxwell's "Theory of Heat" for $1.25; "Elementary Treatise on Electricity," $2.25; his larger work in two volumes on "Electricity and Magnetism," $8.

(5298) F. W. P. asks: 1. How can I reduce stick phosphorus to a powder, or to a form I can handle in making an alloy? A. Use red phosphorus. Stick phosphorus cannot be powdered and is very unsafe to work with. 2. Can mercury be deposited on brass so that it will not scratch off? If so, how? I have a bell metal gong I wish to make a reflector of. A. This is an impossibility as far as a practical reflector is concerned. Silver-plate it.

(5299) R. A. G. writes: Will you please tell me which is the best system of penmanship for a telegraph operator's use—whether back or forward hand, which can be written the faster, also where can I get the system you recommend? A. The best system of penmanship for telegraphic, *i. e.*, receiving, is that which is simplest and quickest to execute. This appears to be the moderately rounded hand with forward stroke; it is natural for the action of the muscles and admits of great speed.

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August 15, 1893,

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