

THE MODERN THEORY OF SOLUTION. A Memoir by Pfeffer, Van't Hoff, Arrhenius and Raoul. Translated and edited by H. C. Jones, Ph.D. New York: Harper Brothers, 1899. Pp. 133 12mo.

The book before us will prove of great value to all those who are interested in theoretical chemistry, and the papers which are included in it are of great importance and the bibliography is very complete. This is also a volume of Harpers' Scientific Memoirs, and we are glad to note that six other volumes of the series are now in active preparation.

TWENTIETH CENTURY SKETCH BOOK. By M. H. Avery, Woonsocket R. I. 1898. Price 50 cents.

This up-to-date method of sketching will doubtless prove interesting to many who are anxious to make progress in mechanical and geometrical and trigonometrical drawing. No drawing-board, T-square, scale, angles, or protractor are required. It is made in two parts, one without angle readings and the other with angle readings.

THE BRITISH NAVY. By A. Stenzel, Captain Imperial German Navy, Retired. New York: E. P. Dutton & Company, London: T. Fisher & Win. 1898. Pp. 327. 4to. Price \$5.

This work, a translation from the German, has a special interest due to the fact that it is an impartial survey of the British navy from the standpoint of a trained foreign critic. While the general tone of the book is distinctly complimentary, Captain Stenzel is at times severely critical, and indicates what seem to be the weak points both in the material and administration of the British navy. The work opens with a historic survey, followed by chapters on the Admiralty and its naval policy. Then follow a comprehensive description of the stations and dockyards, and chapters on the personnel, the education and training, and the uniform of the navy. This matter will be much of it new to the general reader, and not so familiar as that contained in the chapter on material. This last, although it goes over well-worked ground, is excellent in its arrangement and selection. It commences with the historical development, showing excellent photographic views of the last and largest of the old 3-deckers, as represented by the "Duke of Wellington," of 131 guns and 6,071 tons. The growth of the armored ship is traced by diagram, photograph, and description from the "Wellington" to the modern "Majestic." The illustrations are many and excellent, and the work is concluded with a complete table showing all the ships of the navy, with their particulars of size, speed, armament, and cruising qualities.

HANDBUCH DER TELEPHONIE. Nach dem Manuscript des Dr. Victor Wietlisbach. Bearbeitet von Dr. Robert Weber, Vienna: A. Hartleben, 1899. 372 illustrations. Large 8vo. Pp. xiv., 368. Price \$3.

The work of the late Dr. Wietlisbach, which lies before us, constitutes one of the most valuable contributions to the literature of telephony which has yet appeared. The eminent position occupied by the author as Welland director of the Swiss telephone service in Bern, and his vast technical knowledge, well fitted him for the task of producing a handbook which has surpassed anything that has yet appeared in German. The care bestowed upon every detail of the subject, the clearness of the verbal and mathematical explanations, and the exhaustiveness with which everything relating to the telephone has been discussed, should earn for the book a prominent place in the technical library of every electrician.

PAGANINI'S PHOTOGRAMMETRISCHE INSTRUMENTE UND APPARATE FUR DIE REKONSTRUKTION PHOTOGRAMMETRISCHER AUFNAHMEN. Von Prof. E. Dolezal. Separat-Abdruck aus Der Mechaniker. Berlin W.: F. and M. Harrwitz, 1899. 9 illustrations. Price 50 cents.

In 1855, Prof. Porro, of Milan, made the first attempt at applying the camera to geodesy, and thus founded the modern science of photogrammetry. Since Porro's time savants have endeavored to develop the results obtained and to bring this new branch of surveying into more general use. Of these men perhaps the most prominent is Prof. L. P. Paganini, Director of the Photographic Division of the Military Geographical Institute of Florence. The little pamphlet which lies before us is a reprint of an article which appeared in Der Mechaniker, and gives a history of Paganini's work and describes in detail the various instruments which he has invented. Since Paganini is so closely identified with the development of photogrammetry, it necessarily follows that Prof. Dolezal's article contains everything that is now known of the science. His pamphlet is therefore to be considered as a valuable contribution to the literature of geodesy.

ORGANIC CHEMISTRY OF CARBON COMPOUNDS. By Victor von Richter. Edited by Prof. R. Anschütz. Translated by Prof. Edgar F. Smith. Vol. I. Chemistry of Aliphatic Series. Philadelphia: P. Blakiston's Son & Company, 1899. 8vo. Pp. 635. Price \$3.

Richter's Organic Chemistry is well known in the United States as a standard work, which no chemical library can do without. The present work is a translation from the eighth German edition, which has been ably edited by Prof. Anschütz, and the subject matter is vastly different from that given in the earlier editions. The marvelous advances in the various lines of synthetic organic chemistry have made many of the changes in the text absolutely necessary. It is a book which can be confidently recommended to all who are in need of an advanced work on organic chemistry. The second volume, which will be devoted to "The Aromatic Series," is in rapid preparation, and will be published during 1899.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion: about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

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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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Minerals sent for examination should be distinctly marked or labeled.

(7642) J. A. K. asks for a formula for making blue prints of maps, etc. I used red prussiate potas. 120 gr.; ammonia cit. and iron, 140 gr.; pure water, 4 oz.; mixed them separately, and then poured together, but the white was of a yellowish cast instead of a white. A. We think the proportion of chemicals is too small. Try using the following: Iron and ammonium citrate saturated, 1 oz.; water, 4 oz. Mix up this solution separately and then mix another solution composed of potassium ferrocyanide and water, 4 oz. For use mix equal quantities and float the paper for two minutes.

(7643) H. A. S. asks: 1. Will an electric current meter which is made for 104 volts register the proper amount if used when the voltage is 115? A. A current meter is not made for the voltage, but for the amperes which pass through it. It will register more current if lamps which are made for 104 volts are put upon a 115 volt current, since more current will then flow. This is because the filament becomes hotter and its resistance is made lower. 2. Please inform me also how to remove grease or oil from an old belt so the cement will hold in splicing. A. Soak the ends of the belt in benzine and the oil will be dissolved.

(7644) R. C. asks: Can liquid oxygen be kept securely in any suitable receiving vessel? Is it as yet a commercial commodity? A. Any substance with a boiling point below the ordinary temperature of the air cannot remain in the liquid form in the open air. It will boil and pass into the form of vapor. This is the reason why liquid oxygen or liquid air cannot be kept in the liquid form. It boils at about 300° Fah. below zero. It absorbs heat rapidly from the air because of the great difference between it and ordinary air in temperature, and boils away very rapidly. If held in a receptacle till it had reached the temperature of the air, the pressure would be 10,000 to 12,000 pounds per square inch. This is the same as saying that it is impossible to confine it. It is not on sale anywhere.

(7645) H. G. W. writes: Will you please tell me what baths are used to cleanse brass to prepare it for polishing? I refer to old brass which is to be refinished. Also is there any way to restore the finish of hard rubber which has grown green and dead looking? A. Try removing the lacquer with alcohol; after this is done, you can proceed to clean the brass. There are many substances and mixtures which will clean brass, as oxalic acid, hydrochloric acid, and there are other acids which will do it, but probably oxalic acid is the best. The acid must be well washed off and the brass dried. It should be remembered that oxalic acid is poisonous. You will find it almost impossible to restore the color to hard rubber. We recommend you to try polishing it with very fine putty powder and water and finish with a piece of silk.

(7646) C. M. writes: A friend of mine has a lightning rod on his house fastened close to the wall (frame house) by strips of sheet iron, instead of leaving a space of some inches. The end of the rod is about 2 feet in the ground, having no plate on its end, and I often read in books that all the water and gas pipes must be connected to the rod. Please let me know if

this is right or not. Can I test the lightning rod with a magneto machine, and how can I do it? Can you refer me to any SUPPLEMENT describing how a lightning rod must be erected? A. Putting a lightning rod on a house is a very simple matter. Fasten it as firmly to the house as possible. An air gap is of no consequence. Do not insulate the rod from the house. Connect the water pipes to the rod. If there are no water pipes, ground the rod in a moist place with an ample iron plate. Carry the rod above the house at least 4 feet, at all gables and chimneys. Tip each upper end with several points. Iron rods are as good as or better than copper. To test the joints with a magneto, bring wires from the top and the bottom of the rod to the magneto and see if the bell rings well through the rod as a part of the circuit. To test the ground with a magneto, connect the rod and the magneto by one wire. Run another wire from the other side of the magneto to a ground near the ground plate of the rod. The best article that has appeared in many years upon lightning rods is by Mr. McAdie, of the United States Weather Bureau, in SUPPLEMENT, No. 998, price 10 cents. The subject is well treated in Thompson's "Elementary Lessons in Electricity," price \$1.40 by mail.

(7647) A. J. A. writes: Some time ago you gave a formula for cleaning and polishing sea shells. I cannot find the article treating upon this subject. Have looked papers through with aid of index several times. A. 1. Porcelainous shells are so hard as to require the apparatus of a lapidary to cut or polish them, but they are generally so smooth as to require no rough grinding. They may be polished by using a felt wheel and applying putty powder. Nacreous shells or those of the pearl variety may be filed and cut without a great deal of difficulty. Pieces to be turned are first roughly shaped on the grindstone, then turned and polished with pumice stone, putting on the final polish with rottenstone. Irregularly shaped pieces are filed and ground, then smoothed with pumice stone and water, and finished with rottenstone. The rottenstone is sometimes mixed with sulphuric acid full strength, or slightly diluted, to heighten the polish. 2. Rough shells are polished by first grinding them on a coarse stone, then smoothing them with pumice stone and water on a buffer wheel or with a hand polisher, and finishing with rottenstone.

(7648) F. E. L. asks: Does the chain on a bicycle travel faster or slower according to the size of the sprocket wheels, the gear remaining the same, and if so, is the work that it performs heavy or light in the same proportion to the speed that it travels? A. The chain on the larger sprockets travels the fastest for a given gear and has the lightest work.

TO INVENTORS

An experience of 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.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending APRIL 11, 1899.

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and patent numbers. Includes items like Acid and making same, nitrobenzyliden sulfonic; Homolka & Stock; Advertising apparatus, J. L. Males; Air brake, C. F. Bane; Air heating and circulating apparatus, E. F. Porter; Alarm, See Burglar alarm; Fire alarm; Animal trap, J. H. Mackintosh; Ant trap, Cash & Stephens; Antiseptic composition, C. A. O. Rosell; Automatic register, K. D. Camp; Bar, See Sealing bar; Bake pan, J. W. De Walt; Baling device, portable, C. Hebard; Ball, Work & Haskell; Bark peeling machine, L. D. Aiden; Barrel, J. L. Price; Basin and sewer inlet, combined catch, Rogers & Rudge; Basket, fruit or vegetable, R. B. Fuller; Bath cabinet, vapor, G. Paternoster; Bearing, antifriction, J. Waterbury; Bedstead, metal, C. F. Road; Belt fastener, W. C. Humphrey; Berth, A. N. Chamberlain; Bicycle, W. C. Brandenburg; Bicycle, C. L. Merkel; Bicycle, chainless, O. N. Olson et al.; Bicycle driving mechanism, Carlson & Gothe; Bicycle pedal, R. B. Garcia; Bicycle seat, A. M. Cushing; Blank, negotiable instrument, M. J. Stein; Blow er, rotary, T. W. Green; Board, See Ironing board; Bobbin and thread holder, T. J. Murdock; Boiler cleaner, J. C. Fridertzi; Boiler tube cutter and expander, W. D. Hervey; Bolt and lock, combined, J. M. Forney; Bolt socket, king, H. C. Swan; Book leaf, W. A. Vawter; Boot or shoe tree, O. I. Howe; Bottle, E. Ver Standig; Bottle, non-refillable, J. Erwin; Bottle, non-refillable, T. P. Greenbow; Bottle, non-refillable, A. G. Snowdon; Bottle stopper, W. P. Bonwick; Bottle washer, Cobb & Dyer; Bottle wrapper, J. C. Schaeffer; Bowling alley, P. C. Biersach; Box, See Cigar box; Display box; Feed box; File box; Bracket, See Shelf bracket; Brake, See Air brake; Car brake; Brake beam, W. A. Punks; Bridge, drier, H. Hoch; Brush machine, M. Hellwig; Brush, rotary tooth, M. P. Gill; Buckets, means for tripping, L. A. Cook; Bulkhead doors, means for automatically closing; A. von Knorring; Burglar alarm, H. A. Holloman; Burglar alarm and lamp lighter, combined, J. J. Hinson; Burner, See Gas burner; Vapor burner; Butter holding and slicing apparatus, G. B. Leby; Butter package, J. W. Barnes; Button, C. J. Hixley.

Table listing inventions with names and patent numbers. Includes items like Cable support, W. A. Nordyke; Camera, folding photographic, Hill & Price; Camera, photographic magazine, A. Lechl; Can jacket, F. E. Jordan; Car air pipe coupling, railway, M. F. Sinclair; Car brake, G. Lewis; Car brake, automatic, G. Schumann; Car coupling, G. Findlay; Car coupling, C. A. Taylor; Car coupling, T. Whaley; Car, dumping, N. Barney; Car gate, E. P. Sargent; Car sill or stringer, R. W. Oswald; Car street railway, E. G. Allen; Carbon sorting machine, Richmond & Zellers; Carbureter, C. M. Kemp; Card and envelop, quotation, J. E. Hewett; Card holder and ejector, R. Joy; Carding engine, Mills & Fenney; Carding engines, apparatus for grinding flats for rotary, C. Mills; Carrier, See Luggage carrier; Cartridge loading machine, F. Render; Case, See Packing case; Casket, pall and embalming table, child's combined, J. E. Harvey; Casting apparatus, metal, A. I. Walker; Catheter, electric, R. P. Johnson; Centrifugal machine, L. Rissmuller; Chair, See Dental chair; Chairs, ball bearing for opera or other, L. D. Peimer; Change tray, M. Eichholz; Churn, N. Decker; Churn, O. F. Vaughan; Churn, T. W. Wood; Churn and butter worker, combined, H. Feldmeier; Cigar box, W. Tribble; Circuit breaker, H. E. Andersson; Circuit breaker, H. P. Davis; Cithern, guitar, F. Pettermann; Clamp, See Handlebar clamp; Pipe clamp; Telescope; Cleaner, See Boiler cleaner; Slate cleaner; Window cleaner; Clock winding indicator, S. G. Button; Clothes drier, W. W. St. John; Clothes line reel, H. Huebner; Clothes line support, T. V. Allen; Coating one metal with another, etc., S. H. Thurston; Condensing apparatus, steam, J. I. Thornycroft; Cornet, J. J. Neumann; Cotton, device for measuring fiber length of, W. E. Stranback; Cotton press, E. M. Ivens; Coupling, See Car coupling; Car air pipe coupling; Locomotive tender coupling; Thrill coupling; Whiffletree coupling; Yoke coupling; Cultivator, H. Brockmann, Jr.; Cultivator, I. Detheridge; Curling iron heater, V. E. Bernson; Cutter, See Boiler tube cutter; Meat or vegetable cutter; Tobacco cutter; Cycle dress guard, lady's, M. Diehl; Damp er, steam, P. C. Hahn; Delivery apparatus, disk or coin controlled, W. T. Gresset; Dental chair, A. J. May; Detonating compound, G. M. Hathaway; Digger, See Potato digger; Dish washer, J. W. Sullivan; Display box, J. H. Weeks; Displaying device, A. C. Mills, Jr.; Door, automatic sliding, D. Schuyler; Door fastener, J. E. Salade; Door hanger, A. Newell; Doors, adjustable track for sliding, M. C. Richards; Dredge, A. J. Severance; Drier, See Clothes drier; Dye and making same, brown tetrazo, Levinstein & Mensingh; Dye and making same, yellow, R. Bohn; Eaves trough, C. C. Scott; Electric arc forming device, J. Czikowski; Electric light radiator, H. Stenz; Electric selector systems, battery cutout for, T. C. Drake; Electrical conductor, flexible, J. W. Gottschalk; Electrical distribution system, C. F. Scott; Electricity, method of and apparatus for administering therapeutic, W. P. Horton, Jr.; Electrode for electric accumulators, H. Pieper; Films; Electrodes, machine for making metallic ribbon for battery, C. Howell; Electrodes, making battery, J. C. Howell; Electrotype, W. T. Barnum; Elevator, See Pneumatic elevator; Elevator controller, F. S. Braid; Elevator guide, A. Bakes; Elevator safety attachment, G. Fox, 2d; Engine, See Carding engine; Gas engine; Rag engine; Rotary engine; Steam engine; Traction engine; Engine reversing gear, D. Waits; Engines, electric igniter for gas, E. W. Graef; Engines, incandescent tube igniter for gas, E. W. Graef; Evaporating pan, W. G. Page; Extensible platform, J. Burwell; Extension table, N. Alperin; Extension table, Eastman; Eyeglass holder, W. H. Bailey; Eyeglasses, C. E. Norton; Fare register, W. N. Brewer; Farm gate, L. Vernon; Fastening device, D. W. Ikeier; Feather, W. W. Evans; Feed box, W. V. Evans; Feed cutter box, P. Klumb; Feed water purifier and heater for steam boilers, H. F. Howard; Fence post setting apparatus, D. O. Baer et al.; Fence, wire, J. R. Knowlton; Fifth wheel, E. B. Smith; File box or case, W. S. Grange; File, letter, S. M. Brydges; File, memoranda, W. L. Smith; Filing rack, W. T. Campbell; Filter and cleaner, Lindas & Tonner; Fire alarm, Green & Halsey; Fire alarm, automatic, C. E. Lombard; Fireman's helmet, Gallagher & Haynes; Fire protective shutter, Boles & Laass; Fruit cleaning machine, B. B. & J. H. Wright; Fuel, means for feeding and burning pulverized, W. V. Evans; Funnel, C. F. Krause, Jr.; Gage, See Pressure gage; Game board, M. R. Jewell; Garment supporter, Schumacher & Makins; Gas burner, acetylene, H. E. Saffer; Gas engine, H. E. Graef; Gas engine, E. W. Graef; Gas generator, P. A. N. Winand; Gas generator, acetylene, Conibar & Ray; Gas generator, acetylene, J. H. & P. M. Dysart; Gas heater, H. C. Steinboff; Gate, See Farm gate; Rolling gate; Gearing, W. W. Kenfeld; Generator, See Gas generator; Glassware etching, stamping, or marking machine, J. E. Lippincott; Glove, J. Horn; Golf club head, G. Low; Grain scourer, F. Holtzhausen; Grinding mill, W. F. Davis; Grinding mill, Davis & Casaden; Grinding wheel, U. Eberhardt; Guard finger, J. Shanks; Gun, automatic machine, F. M. Garland; Hame and trace connection, Peavy & Dickson; Handle bar clamp, B. D. Harris; Hanger, See Pipe hanger; Harrow draught attachment, sidehill, G. A. Brockhurst; Harrow, metallic, R. T. Horning; Hat, J. W. Penn; Hat blocking and pressing machine, J. C. Mulcaby; Hay loader, W. B. Kirkpatrick; Heater, See Curling iron heater; Gas heater; Heating apparatus, hot water, H. Wittbold; Heel, ventilated shoe, G. Ferrata; Hinge, C. A. Roepke; Hoisting and conveying apparatus, P. M. Barrett; Holdback lock, W. B. Sheer; Hook, See Snap hook; Horse driving device, J. F. Hughes; Horse detacher, K. M. Brammell; Hotel or club register, C. F. Hoffman; Hub attaching device, A. W. Anthoine; Hub, ball bearing, G. Simpson; Hydraulic power machine, A. L. Rinearson; Ice cutting machine, C. H. Edmonds; Ice forming apparatus, P. Martin; Incandescent mantle, J. Lederer; Indicator, See Clock winding indicator; Temperature indicator; Inhaler, G. M. Merritt; Ironing board, shirt bosom, H. Monk; Jack, See Wagon jack.

(Continued on page 256)