

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 next issue.

The best results are obtained by the Imp. Eureka Turbine Wheel and Barber's Pat. Pulverizing Mills. Send for descriptive pamphlets to Barber & Son, Allentown, Pa.

Fuller & Stillman, Chemical Engineers and Assayers, 40 Broadway, New York

Steam Tug Machinery, Engines, Boilers, Sugar Machinery. Atlantic Steam Engine Works, Brooklyn, N.Y.

The Secret Key to Health—The Science of Life, or Self-Preservation, 300 pages. Price, only \$1. Contains fifty valuable prescriptions, either one of which is worth more than ten times the price of the book. Illustrated sample sent on receipt of 6 cents for postage. Address Dr. W. H. Parker, 4 Bulfinch St., Boston, Mass.

The Baker Blower runs the largest sand blast in the world. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa.

Cut Gears for Models, etc. (list free). Models, working machinery experimental work, tools, etc., to order. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.

Magnets, Insulated Wire, etc. Catalogue free. Goodnow & Wightman, 176 Washington St., Boston, Mass.

Forsyth & Co., Manchester, N. H., & 213 Center St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery Send stamp for illus. cat. State just what you want.

Wright's Patent Steam Engine, with automatic cut-off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

H. Prentiss & Co., 14 Dey St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

The Horton Lathe Chucks, prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Linen Hose.—Sizes: 1 1/2 in., 20c.; 2 in., 25c.; 2 1/2 in., 29c. per foot, subject to large discount. For price lists of all sizes, also rubber lined linen hose, address Eureka Fire Hose Company No. 13 Barclay St., New York.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

Bradley's cushioned helve hammers. See illus. ad. p. 142.

Band Saws a specialty. F. H. Clement, Rochester, N. Y.

Sheet Metal Presses, Ferracite Co., Bridgeton, N. J.

Eagle Anvils, 9 cents per pound. Fully warranted.

Vertical Engines. F. C. & A. E. Rowland, New Haven, Ct.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Noise-Quelling Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

Stave, Barrel, Keg, and Hoghead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

New 8 1/2 foot Boring and Turning Mill for sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. of Porter Mfg. Co., page 78.

Cooper Manufacturing Company, Mt. Vernon, Ohio, Manufs of Stationary, Portable, and Traction Engines, Saw Mills, Grist Mills, Mill Machinery, etc. Engineers and Contractors. Circular free.

Millstone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., New York.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Elevators, Freight and Passenger, Shafting, Pulleys, and Hangers. L. S. Graves & Son, Rochester, N. Y.

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in SCIENTIFIC AMERICAN of this week.

Drop Hammers, Die Sinking Machines, Punching and Shearing Presses. Pratt & Whitney Co., Hartford, Ct.

Electro-Bronzing on Iron. Philadelphia Smelting Company, Philadelphia, Pa.

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings, all kinds; strong and durable; and easily worked. Tensile strength not less than 65,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Hand Fire Engines, Lift and Force Pumps, for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., and 33 Liberty St., N. Y. city, U. S. A.

Steam and Gas Fitters' Tools a specialty. Send for circulars. D. Saunders' Sons, Yonkers, N. Y.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Wm. Sellers & Co., Phila., have introduced a new Injector, worked by a single motion of a lever.

The Asbestos Roofing is the only reliable substitute for tin; it costs only about one-half as much, is fully as durable, is fire-proof, and can be easily applied by any one. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York, are the sole manufacturers.

Book free to Inventors. Address C. A. Shaw, Boston.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y.

Wanted.—A place is desired by a man of experience and with good references, in charge of experimental machinery. Parties having machines to develop or under way, are invited to correspond or talk with William A. Lorenz, 363 Macon St., Brooklyn, N. Y.

NEW BOOKS AND PUBLICATIONS.

THE NEW YORK HERALD WEATHER SERVICE. 1877-78-79. 8vo, paper, pp. 34.

This pamphlet sketches the development of the Herald Weather Bureau, and gives a list of the storm warnings cable by it to Europe and the manner of their fulfillment, with other cognate information.

GEOLOGICAL SURVEY OF KENTUCKY. N. S. Shaler, Director.

The late publications of this survey embrace the following: Iron: the impurities which commonly occur with it, and their effects. By Wm. B. Caldwell, Jr. Report on the Limonite Ores of Trigg, Lyon, and Caldwell Counties. By Wm. B. Caldwell, Jr. Notes on the Yellow Fever Epidemic, at Hickman, Ky., during the summer and autumn of 1878. By John R. Proctor.

ANALYSES OF THE SUGAR QUESTION. By Henry A. Brown. Saxonville, Massachusetts. Paper, pp. 42.

Mr. Brown, formerly Special Treasury Agent of the United States, discusses the very complex sugar question as an expert, and reaches the conclusion that the present sugar tariff ought to be modified. By making the following "moderate changes" he believes that the consumption of sugar would be enormously increased, while the revenue from sugar food would still be ample, without injuriously affecting any public or national interest: First, the classification of melado as not above No. 7 Dutch standard sugar. Second, abolish the additional 25 per cent ad valorem on all sugar. Third, strike out the words "after being refined" in the section relating to colored sugars. Fourth, all sugars under No. 10 D. S. in color, containing 92 per cent or more of crystallizable sugar, to pay the same duty as sugars above No. 10 and not above No. 13 D. S. in color.

PROCEEDINGS OF THE ENGINEERS' CLUB OF PHILADELPHIA. Edited by Charles E. Billin. Vol. I., Nos. 1 and 2.

No. 1 of this new journal embodies the principal papers and more important topics of discussion brought before the club during its first year. No. 2 covers the proceedings of the forepart of the current year. The club starts off with vigor, and the character of the papers presented justifies the hope, if not the prediction, that it will live long and prosper. The proceedings are published at the rooms of the club, No. 10 North Merrick street, Philadelphia.

LIFE AND WORK OF JOSEPH HENRY. By Frank L. Pope. New York: D. Van Nostrand. 12mo, paper, pp. 31.

This puts in an attractive and keepable form Mr. Pope's sketch of the life and discoveries of Professor Henry (having special reference to the development of the electric telegraph), first printed in the Journal of the American Electrical Society.

DARWINISM AND OTHER ESSAYS. By John Fiske. London and New York: Macmillan & Co. 12mo. Price \$2.

The dozen detached essays here brought together are well worth preserving. Mr. Fiske is always outspoken, bright, and suggestive; and he has a happy faculty of seizing upon and setting plainly forth the vital points of a critical discussion. Several of the essays have a historical rather than an immediate interest to those who have kept up with the drift of recent thought; still as a part of the literature of evolution they are worth keeping. The book is well made and has a good index.

HINTS TOWARD A NATIONAL CULTURE FOR YOUNG AMERICANS. By S. S. Boyce. New York: E. Steiger. Price 25 cents.

We should be glad to see this little work (little in size but great in spirit and promise) in the hands of every American parent, teacher, and pupil. It is too much to hope that the traditions of the schools can be displaced by the spirit of true, practical, scientific, and industrial culture, without the waste and misdirection of a large portion of the childhood of many generations. But we believe that the good time is coming, though remote, and the general circulation of Mr. Boyce's Hints would do much to hasten it. The hints to young men on self culture and on growth by culture, are especially sensible and valuable.

TEACHER'S HAND BOOK TO ACCOMPANY AVERY'S ELEMENTS OF NATURAL PHILOSOPHY. New York: Sheldon & Company. 1879.

This little book is chiefly remarkable for the proper emphasis it lays upon the truth that no science teacher can hope to do justice to his work without keeping a constant watch upon the current literature of science. The progress of discovery is so rapid that the most carefully prepared treatise is liable to become deficient in essential particulars before it is published. It may be "up to date" when it goes to press, and antiquated when it leaves the bindery; and the teacher who trusts entirely to his text books is not only sure to be behind the time in the matters of technical information, but is also necessarily lacking in general knowledge, in practical intelligence, and in that affluence of every day facts and suggestions which the true teacher must possess.

ÆSOP'S FABLES. Printed in pronouncing orthography. Published by C. W. Knudsen. South Norwalk, Conn.

Forty fables from the versions of the Rev. Thomas James and Mary Godolphin, printed phonetically to show the application of the English Demotic Alphabet, and to call attention to the spelling reform movement. Though of the opinion that none of the alphabets yet suggested will be the accepted one when English print becomes phonetic, as it is sure to be sooner or later, we believe that efforts like Mr. Knudsen's should be encouraged. They tend to familiarize the rising generation with phonetic print, and thus indirectly break down the absurd prejudice that prevails in favor of our current misspelling, simply because it is familiar.

SEARCY'S LESSONS IN PHONOGRAPHY. By W. E. H. Searcy. Philadelphia: J. B. Lippincott & Co.

The author, a practical law reporter, offers his book as a contribution to the common cause of phonography.

He has drawn his material from all available phonographic sources, and claims to have stripped the subject of all unnecessary mockery and useless verbiage, retaining only such principles and introducing such "improvements" as seem to him needful for the work of verbatim reporting. How far he has succeeded in his aim it is impossible to say without mastering a multitude of hooks and other stenographic devices, which seem to one practically familiar only with Pitman's system, as fearfully numerous.

SCIENCE LECTURES AT SOUTH KENSINGTON. Vol. II. London: Macmillan & Co. Price \$1.75.

These South Kensington lectures set forth in fairly non-technical style the latest results in several departments of science, as understood by English scientists of high rank. The subjects treated are: Polarized Light, by W. Spottiswoode; Thermal Conductivity, Thermodynamics, and the Velocity of Light, by Professor Forbes; Balances, by H. W. Chisholm; Geometrical and Engineering Drawing, and Light House Illumination, by Professor T. F. Pigot; The Laws of Fluid Resistance, by W. Froude; The Bathometer, by Dr. Siemens; Instruments for Experiments on Sound and Temperament, evidently by Dr. W. H. Stone, though no names given; Sensitive Flames as Illustrative of Sympathetic Vibration, by Professor Barrett; Apparatus for Physiological Investigation and for Physiological Chemistry, by Drs. Burden Sanderson and Lauder Brunton; On Eudiometers, by Professor McLeod; and Technical Chemistry, by Professor Roscoe.

ELEMENTARY LESSONS ON SOUND. By Dr. W. H. Stone. London: Macmillan & Co. cloth, pp. 191. Price 80 cents.

As an elementary text book this work of Dr. Stone presents several admirable features. It is well digested, compact, and better illustrated than works of the size are apt to be. The frequent summaries of facts and principles are tersely expressed and serviceable. And the book is well indexed. As a whole the work is peculiar in the fullness of the information given in the neglected field lying between acoustics and music—neglected, that is, in ordinary text books. The marked deficiency of the book is in respect to the more recent developments and applications of sound in connection with the phonograph, the telephone, the microphone, and the like. Though imprinted 1879, there is little to indicate that it was not written more than a twelvemonth earlier.

COMMERCIAL ORGANIC ANALYSIS. By Alfred H. Allen, F. C. S. Vol. I. Cyanogen Compounds, Alcohols and their Derivatives, Phenols, Acids, etc. London: J. & A. Churchill.

The first volume of a practical work which has no rival in English. Its scope is aptly described in the subtitle: A treatise on the properties, proximate analytical examination, and modes of assaying the various organic chemicals and preparations employed in the arts, manufactures, medicine, etc., with concise methods for the detection and determination of their impurities, adulterations, and products of decomposition. Mr. Allen appears to be competent to the task he has undertaken, and claims to have tested in his own professional experience the correctness of the methods given. The book is well made and printed in good type.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) P. M. asks: Is zinc a mineral or compound metal, and where found? A. Zinc is a metal, seldom found pure. The existence of native zinc seems still to need confirmation. The chief ores are the silicate and oxide. The largest mines of this metal in the United States are in Sussex county, New Jersey. 2. Is tin a mineral or compound metal, and where found? A. Tin is a metal; reported as occurring with the Liberian gold; also in the Rio Tipuani valley, in Bolivia, but probably only an artificial product. (D. Forbes, *Phil. Mag.*, iv., xxix. 133, xxx. 142.) The principal ore of this metal is cassiterite or tinstone, found largely in Cornwall, England—not in this country. 3. What are brass and pewter composed of? A. Brass is an alloy of copper and zinc. Pewter is an alloy of tin and lead, common, 82 tin to 18 lead; fine, 5 tin to 1 of lead.

(2) H. L. V. N. writes: In connection with the "new optical delusion" in the SCIENTIFIC AMERICAN, for August 9, and explanations of same in August 30, I would call attention to one of a similar character, and very, almost unpleasantly, common occurrence. If a person looks intently at a swiftly moving body, such as a train of cars, near-by, and then looks at a stationary body, as the ground, the whole surface of the stationary body will appear to move around several axes with a peculiar compound sinuous motion.

(3) E. H. asks if anything has been discovered which will remove freckles, either instantaneously or by repeated applications? A. A solution of corrosive sublimate, either pure or mixed with cyanide of mercury, is commonly employed for the removal of freckles; but

a collodion, containing ten per cent of its weight of sulpho-carbolate of zinc, has given excellent results without being accompanied by any of the dangers attending the use of the mercurial solution. The following formula is an excellent one: Sulpho-carbolate of zinc, 1 part; collodion, 45 parts; oil of lemon, 1 part; absolute alcohol, 5 parts. Consult your physician in regard to application.

(4) G. P. A. asks: 1. Will ordinary clay, such as is used for flower pots, answer for the porous cells of a galvanic battery? A. If well burned, yes. 2. How may commercial zinc be purified for use in a battery? A. Pure zinc is prepared by distilling a mixture of zinc oxide and charcoal. The oxide must be purified by solution in an acid, and precipitation therefrom by a dilute alkali. See Wagner's Chemical Technology. New Jersey zinc is pure enough for ordinary battery purposes.

(5) J. R. H. asks: 1. Do gum belts require any dressing? A. No. 2. What kind of couplings are the safest and most durable for main shafts where belts run in all directions from it? A. Flange couplings and bolts. 3. Can dust from emery belts used for polishing wood be removed from each belt and the room as it is made: if so, by what means? A. Yes, by the use of an exhaust fan. 4. Is there any known composition or paint which, if applied to tin valleys and roofs, will prevent leaking? A. Some of the so-called India rubber paints may answer.

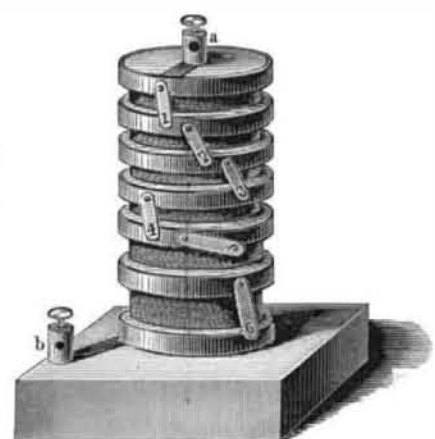
(6) C. C. asks (1) how to find the horse power of an engine. A. See p. 267 (4), Vol. 46, of the SCIENTIFIC AMERICAN. 2. What is the difference between a high and low pressure boiler; please explain and oblige? A. There are certain forms of boilers which are designated in the trade as low pressure or high pressure, but any form of boiler can be used as a low or a high pressure boiler, if it have strength proportionate to the pressure of steam to be carried.

(7) C. G. & Co. ask: Will a band saw run on wooden pulleys for sawing oak plank 2 inches thick or for sawing wagon fellicies? A. The pulleys would answer for a time, but the wood would shrink and swell under the influence of the weather, and give constant trouble.

(8) H. M. D. writes: To ascertain the amount of power it takes to drive a certain number of machines, can it not be done by putting them all at work at their full capacity and then throw off the main belt, leaving them all ready to start to work as soon as there is power enough applied, then take a cord or belt, and make one end fast to one arm of the main pulley and throw the other over on the outside and wind around, then hang on weights enough, on the lower end of the cord to start the machinery at its usual speed, then weigh the weights? It seems to me that the above method is a correct one to ascertain the correct amount of power used. A. If you can accomplish it as you propose, it will give you the amount of power; but we think you will find it a difficult thing to do.

(9) B. B. M. asks (1) for a receipt for making mustard for table use. A. 1. Salt, 1 1/2 lb.; scraped horse radish, 1 lb.; garlic, 2 oz.; cloves, 2 oz.; hot vinegar, 2 gallons; macerate in a covered vessel 24 hours, strain and add flour of mustard, q. s. 2. Mustard, 3 lb.; salt, 1 lb.; vinegar, grape juice, or white wine, to mix. 2. What is the rule for getting the weight of hay in bulk as in a mow? A. A solid cube of dry hay, 10 feet square, weighs about one ton.

(10) A. R. M. asks how to make a cheap rheostat. A. Eisenlohr's column of resistance, shown in the accompanying cut, is inexpensive and very convenient. It consists of a cylinder of mahogany or other compact wood, having about nine grooves cut in it. The cylinder is saturated with paraffine or varnished with shellac, and the spaces between the grooves are bound with brass bands. A little brass bar, turning on a screw, is made to extend from one ring to the other, as shown; these bars must be slightly bent so as to press



with some force upon the bands. Covered wire of a known resistance is wound in these grooves, the shortest length containing the given unit once or an even number of times. The length of the coils of wire in the successive grooves increases from 1 to 9; the ends of each wire are soldered to the two nearest bands, the upper band being connected with the screw, *a*, and the lowest with *b*. When this column is inserted in a circuit, the current passes from one ring to another through the bars, whose resistance is inconsiderable, but when one of the bars is turned aside, as shown in the engraving, the current passes through the intervening coil.

(11) W. W. M. asks: Where can manganese in the metallic state be obtained; can it be melted in a plumbago crucible, either by itself or in molten copper? A. Metallic manganese is not a commercial article, but small quantities of it may be purchased from dealers in rare chemicals, etc., at \$1 per gramme. In appearance it somewhat resembles iron, but is usually much harder, and requires a very strong white heat to effect its fusion. In small quantities the metal will alloy with copper at a high temperature, if protected from the air by powdered carbon. 2. I obtained some