

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 publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

A Mechanical Engineer, thorough mechanic and draughtsman, desires engagement. Pumping and hydraulic machinery a specialty. Address Hydraulics, Box 773, New York city.

Many of the largest and finest structures in this country are painted with H. W. Johns' Asbestos Liquid Paints, which are rapidly taking the place of all others for the better classes of dwellings, on account of their superior richness of color and durability, which render them the most beautiful as well as the most economical paints in the world. H. W. Johns' Mfg Co., 87 Maiden Lane, New York, are the sole manufacturers.

Stationary, Paddle, and Propeller Yacht Engines, Propeller Wheels, etc. W. J. Sanderson, Syracuse, N. Y.

Judson's Sectional Assay Furnaces. Muffles 6 x 12 and 9 x 15in. W. E. Judson, Cleveland, O.

Walrus Leather, Solid Walrus Wheels; Wood Wheels covered with walrus leather. Greene, Tweed & Co., N. Y. We will purchase or manufacture on royalty, patented articles of real merit. Farley & Richards, Phila., Pa.

Wanted—A Button Machine that will draw and pierce a tin blank; second-hand; give price; also tin blanks and strips wanted. Opal Ware Co., 323 Chestnut St., Philadelphia, Pa.

Peck's Patent Drop Press. See adv., page 173.

Nickel Solution for dipping. Only boiling; no battery; no royalty. Fine coating; stands polishing. Half gallon sample cans sent on receipt of \$1. Recipe, \$5. Reliable gold, silver and copper dips. Recipe, \$2 each. A. Lovie, 92 N. Broadway, Baltimore, Md.

All kinds Machine Drawings. Inventors' work a specialty. Office hours 9 to 6. 733 Broadway, 5d floor front.

Vertical & Yacht Engines. T. P. Pemberton, 276 Water St., N. Y.

Brick Presses for Fire and Red Brick manufactured at 309 S. Fifth St., Phila., Pa. S. P. Miller & Son.

Having bought the Forsythe Scale Works here, we offer our present manufactory, with 25 H. P. engine and boiler, for sale. This property is well situated for manufacturing, only three blocks from depot. Will be sold low. Waukegan, Ill. is 35 miles north of Chicago. Full description sent on application. Powell & Douglas, M'rs Pumps and Windmills, Waukegan, Ill.

Spokes and Rims, white oak and hickory, best quality, to any pattern, and Hammer Handles of best hickory. John Fitz, Martinsburg, West Va.

For the best Stave, Barrel, Keg, and Hoghead Machinery, address H. A. Crossley, Cleveland, Ohio.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, borders, etc., sent on receipt of \$2. Palm & Fechteler, 403 Broadway, New York city.

Linen Hose and Rubber Hose of all sizes, with or without coupling. Greene, Tweed & Co., New York.

Brass & Copper in sheets, wire & blanks. See adv. p. 173.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 531 Jefferson St., Philadelphia, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

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

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

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Condit, Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

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

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

Bradley's cushioned helve hammers. See illus. ad. p. 110.

Ice Machines selected. Information on all kinds. Benjamin's Sci. Expert Office, 37 Park Row, New York.

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

Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs only \$20. Attached to any instrument. T. Shaw, 915 Ridge Ave. Phila.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

Portable Forges, \$12. Roberts, 107 Liberty St., N. Y. Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J. Eclipse Portable Engine. See illustrated adv., p. 157. New Inventions examined and tested. Designs and improvements. Reports for investors. Recipes and information on all industrial processes. Benjamin's Sci. Expert Office, 37 Park Row, New York.

Horizontal Steam Engines and Boilers of best construction. Atlantic Steam Engine Works, Brooklyn, N. Y.

The Paragon School Desk and Garretson's Extension Table Slide manufactured by Buffalo Hardware Co.

Planing and Matching Machines, Band and Scroll Saws, Universal Wood-workers, Universal Hand Jointers, Shaping, Sand-papering Machines, etc., manuf'd by Bentel, Margedant & Co., Hamilton, Ohio. "Illustrated History of Progress made in Wood-working Machinery," sent free.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien M'rs, 23d St., above Race, Phila., Pa.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their castings over all others. Circular and price list free.

Diamond Saws. J. Dickinson, 64 Nassau St., N. Y. The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. All makes and sizes of Steam Hammers bored out. L. B. Flanders Machine Works, Philadelphia, Pa.

For Superior Steam Heat. Appar., see adv., page 172.

Valve Refitting Machine. See adv., page 174.

Cut Gears for Models, etc. Models, working machinery, experimental work, manufacturing, etc., to order. D. Gilbert & Son, 212 Chester St., Phila., Pa.

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

The E. Horton & Son Co., Windsor Locks, Conn., manufacture the Sweetland Improved Horton Chuck. Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 45.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

Inventors' Institute, Cooper Union. A permanent exhibition of inventions. Prospectus on application. 733 Broadway, N. Y.

For Reliable Emery Wheels and Machines, address The Lehigh Valley Emery Wheel Co., Weissport, Pa.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 174.

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

Nellis' Cast Tool Steel, Castings from which our specialty Plov Shares, also all kinds agricultural steels and ornamental fenceings. Nellis, Shriver & Co., Pittsburg, Pa.

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Circulars on application. Pittsburg Steel Casting Company, Pittsburg, Pa.

New Economizer Portable Engine. See illus. adv. p. 174.

Fine Taps and Dies in Cases for Jewelers, Dentists, and Machinists. Pratt & Whitney Co., Hartford, Conn.

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.

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

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 177. Totten & Co., Pittsburg

NEW BOOKS AND PUBLICATIONS.

CIVILIZATION: IS ITS CAUSE NATURAL OR SUPERNATURAL? Philadelphia: Chas. H. Marot. 8vo, pp. 140.

The author describes himself as a wayfarer in search of the truth, but it is very clear that he had made up his mind on that score long before he began these sermon-like chapters. He holds the origin of civilization to be supernatural, and pronounces the theory of evolution a dream. Christianity, as popularly taught, he describes as no better than Darwinism; but holds, notwithstanding, that true Christianity is the sole foundation of human progress.

MINES OF MAINE, 1879-80. By F. L. Bartlett, State Assayer. Portland: B. Thurston & Co. Price 25 cents.

Describes the present condition and future prospects of the mines of Maine. Four years ago such a book would have been an impossibility, for there were then no developed mines in Maine. Now there are half a hundred in full operation, yielding gold, silver, and copper. Tin, zinc, arsenic, iron, nickel, and cobalt are also found. There is besides an abundance of non-metallic minerals of value; so that Maine promises soon to take rank among our great mining States. Mr. Bartlett's well made little book will be likely to attract much attention to these long-neglected sources of wealth.

REVISTA CIENTIFICA MEXICANA. Tomo I., Num. 1. Mexico, Diciembre de 1879.

We have here the first number of a New Mexican publication which gives promise of being a valuable addition to the already large list of journals devoted to general science. It contains an illustrated article on the "Different Species of Maguey (Agave) which are cultivated on the Plains of Apam and in the District of Cholula," by Professor Ignacio Blazquez; on the Aneroid Barometer, by Sr. Miguel Perez; on the Sierra Mojada, by Sr. Antonio G. Cubas; on the "Ores of Bismuth of Mexico," by Professor Mariano Barcena, and on "Cenozoic Porphyries," by the same; articles on the "Weather" and on "Geography," and various shorter scientific notes. In size the journal is quarto; the paper is good, the typography excellent, the articles are well written, and the editors have our best wishes for the success of their venture.

SALISBURY'S NEW PHYSICAL SIGN OF SYPHILIS. By Ephraim Cutter, M.D. Reprinted from the American Journal of Dental Science. 12mo., paper, pp. 12.

A verification of Dr. Salisbury's discovery of the fungoid origin of syphilis.

A TREATISE ON THE HORSE AND HIS DISEASES. By B. J. Kendall. Enosburg Falls, Vt.: J. B. Kendall & Co. 16mo, paper, pp. 89.

Contains an "index of diseases," with directions for treatment, a list of drugs used by farriers, and a large number of recipes, etc.

RELATIONS OF EDUCATION AND INDUSTRY TO CRIME AND PAUPERISM. By Henry W. Lord. Lansing, Mich: W. S. George & Co.

This is an address by the Secretary of the Michigan State Board of Charities to the Michigan Superintendents of the Poor in their sixth annual convention. Mr. Lord takes the ground that idleness is more demoralizing than ignorance, and supports it with a sufficient array of fact and logic to justify his opposition to the provision of the Michigan constitution forbidding the teaching of mechanical trades in the State prison.

THE FRANCO-AMERICAN TREATY OF COMMERCE. Pamphlets by Leon Chotteau. New York and Paris.

1. Reports and resolutions relative to a treaty of commerce between the United States and France, adopted in the Chambers of Commerce of the United States and France. 2. Report by Leon Chotteau, delegate of the French committee, of his two campaigns in the United States to secure a lowering of the customs tariffs of France and America, with an introduction by the Secretary of the French Committee, Auguste Desmolins. 3. Translation of "My two Campaigns."

RECENT GOVERNMENT REPORTS. United States. Washington: Government Printing Office.

United States Commission of Fish and Fisheries. Part V. Report of the Commission for 1877. Annual Report of the Secretary of the Treasury on the State of the Finances for the year 1879. Annual Report of the Director of the Mint for 1879. Statistical Abstract of the United States, first number, 1878, Bureau of Statistics. Annual Report of the Chief of the Bureau of Statistics for 1878. Quarterly Report of the Bureau of Statistics relative to imports, exports, immigration, and navigation, to June 30, 1879. Annual Report of the Operations of the United States Life Saving Service for 1878.

REPORT ON EXPERIMENTS IN BOILER BRACING. U.S. Navy Department, Bureau of Steam Navigation. Washington: Government Print.

Contains plates, tables, etc., with a short resumé of the work and results of a series of test experiments to determine the value and resistance of screw stay bolts for boilers under different conditions, using iron, steel, and copper plates of different thicknesses, etc. Bolts not riveted drew out at an average strain of 32,785 lb.; those riveted with the ordinary low conical head required an average strain of 35,033 lb. to draw them through the plate, the rivet head giving an additional strength of 2,248 lb. to a 1 inch stay bolt. The gain in favor of the button head bolt over the ordinary conical head ranged from 23 to 36 per cent.

THE NEW DEPARTURE IN THE COMMON SCHOOLS OF QUINCY. By Charles F. Adams, Jr. Boston: Estes & Lauriat. Price 25 cents.

Contains three papers: 1. The Public Library and the Public Schools; 2. Fiction in Public Libraries and Educational Catalogues; 3. The New Departure in the Common Schools of Quincy, Mass. The new departure is in a direction which the SCIENTIFIC AMERICAN has long advocated, and the results are of such importance as to call for a fuller consideration than there is space for here.

VAN NOSTRAND'S SCIENCE SERIES. New York: D. Van Nostrand. Price 50 cents.

The recent addition to this series of reprints are as follows: No 47. Linkages; the different forms and uses of Articulated Links; by J. D. C. DeRoos. No. 48. Theory of Solid and Braced Elastic Arches, applied to arch bridges and roofs in iron, wood, concrete, or other material; Graphical Analysis; by Wm. Cain, C.E. No. 49. On the Motion of a Solid in a Fluid, and the Vibration of Liquid Spheroids; by Thos. Craig, Ph.D.

HOW AND WHEN THE WORLD WILL END. By Rev. Joseph Wild, D.D. New York: James Huggins, 372 Pearl street.

A course of sermons delivered in a popular church in Brooklyn, the title of the book being that of the last discourse. The entire series is remarkable for the evidence it furnishes of the survival of a phase of culture that most men imagine to have long since passed away.

THE WORLD'S TIME. A table showing equivalent local time every ten minutes during the day at prominent cities in the Eastern and the Western Hemisphere. Issued by the Baltimore and Ohio Railroad Company, 315 Broadway, N.Y.

VAN NOSTRAND'S ENGINEERING MAGAZINE. Volume XXI. July to December, 1879. New York: D. Van Nostrand.

The bound volumes of this well conducted magazine include a wide range of original and selected articles of permanent value to engineers.

REPORT OF PROFESSOR SPENCER F. BAIRD, SECRETARY OF THE SMITHSONIAN INSTITUTION, FOR THE YEAR 1878. Washington: Government Printing Office.

THE SMITHSONIAN INSTITUTION; JOURNALS OF THE BOARD OF REGENTS, REPORTS OF COMMITTEES, STATISTICS, ETC. Edited by Wm. J. Rhees. Washington: The Smithsonian Institution.

A documentary history of the origin and progress of the Smithsonian Institution, with collateral matter relative to its officers and their work.

THE SCIENTIFIC WRITINGS OF JAMES SMITHSON. Edited by Wm. J. Rhees. Washington: The Smithsonian Institution.

Embraces twenty-seven papers contributed by the founder of the Smithsonian Institution to scientific periodicals between 1791 and 1825; with reviews of the scientific character of Mr. Smithson's writings by Professor W. R. Johnson and J. R. M. D. Irby.

BOLETIN DE LA SOCIEDAD DE GEOGRAFIA Y ESTADISTICA DE LA REPUBLICA MEXICANA. Tomo IV. Nos. 6 and 7 Mexico, 1879.

The present double number of the Mexican Geographical Society's Bulletin, which has just come to hand, is mainly taken up with orations delivered by different members on the occasions of the two sessions held in honor of M. Thiers and of Father Secchi. The scientific paper in this issue is by Sr. V. Reyes, and entitled Estadistico-Geographical Teachings as to mortality in the State of Morelos. This article, which must prove of considerable local interest and value, is illustrated with well executed colored charts showing the percentages of death in the different municipalities of the State from various prominent diseases. As with former numbers of this Society's publications, the general make up of the Bulletin is most excellent, and the taste displayed in the typography reflects great credit on the editors and printers.

PROTECTION OF FORESTS A NECESSITY. By S. v. Dorrien. New York: B. Westermann & Co. Paper, pp. 33.

Discusses the devastation of forests in Europe and the lessons learned therefrom, and argues that the protection of forests is a matter of immediate serious solicitude, the existence of forests being absolutely necessary to our national prosperity and life.



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. If not then published, they may conclude that, for good reasons, the Editor declines 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) J. B. W. asks: Would there be danger of springing or breaking a circular or crosscut saw with a press gummer, or would it be safer to use an emery wheel? A. We think it would be safer to use an emery wheel.

(2) W. H. C. asks: (1) In using insulated wire for secondary coil, in that described in your SUPPLEMENT, No. 160, how many layers are necessary to make a spark of about one inch? A. About 30. 2. Would not the extra current and its effects be increased if there were more layers (than two) in the primary? A. Not seriously. 3. Will not a carbon button pressed by a platinum tipped screw make a good commutator? A. No; the carbon will soon burn out. 4. What mixture is used on a copper disk for engraving glass? A. Emery and oil.

(3) F. F. writes: I am replating spoons which have been in use and become badly scratched. How can the surface be made smooth again most expeditiously? A. Use emery wheels of different forms and grades of fineness. 2. How is the fine polish seen on new work obtained? A. By burnishing.

(4) C. M. writes: In Vol. xli., No. 25, page 332, SCIENTIFIC AMERICAN, near the bottom of right hand column, I find this: "The concrete is composed of 5 parts sand and gravel as found in the river, 3 parts broken stone, and 1 1/2 barrels Rosendale cement." In this case is the 1 1/2 barrels taken as a unit? And is the composition made up of 1 1/2 barrels cement; 3x1 1/2, that is, 4 1/2 barrels of broken stone; 5x1 1/2, that is, 7 1/2 barrels sand and gravel? When parts are spoken of, is weight or measure intended? When the expression parts is used, as in parts of a compound, parts of an estate, is anything definite said unless a definite unit is given? A. The constituents of concrete mixtures are generally measured. In compositions of matter, when parts are mentioned without reference to a definite unit, weights are usually implied. 2. What is the composition of the potato flour spoken of in the No. 5, present volume, page 72, as being extensively used for sizing and other purposes? A.

Table with 2 columns: Composition of Newly dug potatoes and Potatoes dried at 100° Fah. Rows include Water, Starch, Albumen, Salts, Cellulose, and Fatty matters.

3. What is the composition of the thick and heavy fluid sold by the grocers under the name of golden sirup—it is retailed at about 80 cents per gallon? A. An aqueous solution of cane and inverted sugar and glucose, with a small quantity of sugar impurities.

(5) F. A. W. asks: Is there any way of cutting China or porcelain (vases, for instance) so as to leave a comparatively smooth edge to cut? I have a valuable pair of vases, the top edges of which are badly broken, and I desire to cut the flaring tops off, leaving a straight neck. Can you give me a simple way of cutting? A. Place on a mandrel in a lathe a thin disk of copper or iron 3 inches in diameter. Supply it with rather fine emery and oil, and while revolving it at a speed of 400 or 500 revolutions per minute, hold the vase against the periphery of the disk. The disk should be often supplied with emery and oil.