

AN OLD CONCERN RE-ESTABLISHED.

Horace Waters & Son, dealers in musical instruments in this city, made an assignment not long ago to secure their creditors. Mr. Waters, Sr., after thirty years' experience: hopes, by enterprise, economy, and fair dealing, to re-establish his business and to retain his old customers. To this end, he has opened a store a No. 40 East 14th St., and acts as agent for a number of leading musical instrument manufacturers.

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.

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

Walrus Leather, Solid Walrus Wheels; Wood Wheels covered with walrus leather for polishing. Greene, Tweed & Co., 18 Park Place, New York.

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

We will rent whole or part of third story in our building, with power for light manufacturing. Size, 40 x 80 feet; has 25 windows and power elevator. Located on N. Y. Central Railroad. Rome Revolver and Novelty Works, Rome, N. Y.

Milling attachments for Lathes. W. Main, Piermont, N. Y.

Improved Blind Staples. B. C. Davis, Binghamton, N. Y.

Trout sure to bite. Chr. free. Hill & Co., Lawrence, Mass.

H. W. Johns' Asbestos Liquid Paints are strictly pure linseed oil paints, and contain no water. They are the best and most economical paints in the world.

A party owning, free of debt or other incumbrance, in an excellent location, a new, neat, and substantial factory, fitted with needful power, machinery, tools, patterns, and materials, and in successful operation, manufacturing an entirely new, first-class sewing machine, for which a first-class patent has just been allowed, of which he is sole owner, desires entirely reliable parties of ability, experience, and cash, to take charge of the manufacturing and sales departments in a partnership or stock company. Best references exchanged. Address P. O. Box 343, Chicago, Ill.

Wanted—Machinist, with small capital, to invest in a good business, to take charge as foreman of a foundry and machine shop. Apply to or address W. B. McKeldin, Athens, McMinn Co., East Tenn.

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

For Stationary or Portable Engines, Circular Saw Mills, Grist Mills, and Mill Machinery, good and cheap, address the old manufacturers of Cooper Mfg. Co., Mt. Vernon, O.

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

For Screw Cutting Engine Lathes of 14, 15, 18, and 22 in. Swing. Address Star Tool Co., Providence, R. I.

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

Lincoln's Milling Machines; 17 and 20 in. Screw Lathes. Phoenix Iron Works, Hartford, Conn.

Boilers ready for shipment. For a good Boiler send to Hilles & Jones, Wilmington, Del.

Shaw's Mercury Gauges, 5 to 50,000 lbs.; accurate, reliable, and durable. T. Shaw, 915 Ridge Ave., Phila., Pa.

A Cupola works best with forced blast from a Baker Blower. Wilbraham Bros., 2318 Frankford Ave., Phila.

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

Forsyth & Co., Manchester, N. H., and 213 Centre St., New York. Specialties.—Bolt Forging Machines, Power Hammers, Combined Hand Fire Engines and Hose Carriages, new and 2d hand machinery. Send stamp for illustrated catalogues, stating just what you want.

Linen Hose.—Sizes: 1½ in., 20c.; 2 in., 25c.; 2½ in., 30c. 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.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are being sold out very low by the George Place Machinery Agency, 121 Chambers 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.

American Fruit Drier Mfg. Co., Chambersburg, Pa.

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

Vertical Burr Mill. C. K. Bullock, Phila., Pa.

Eclipse Portable Engine. See illustrated adv., p. 414.

Diamond Engineer, J. Dickinson, 64 Nassau St., N. Y.

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

Excelsior Steel Tube Cleaner, Schuykill Falls, Phila., Pa.

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.

Pulverizing Mills for all hard substances and grinding purposes. Walker Bros. & Co., 23d & Wood St., Phila., Pa.

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

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Machine Cut Brass Gear Wheels for Models, etc. (new list). Models, experimental work, and machine work generally. D. Gilbert & Son, 212 Chester St., Phila., Pa.

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.

We have opened a sample depot for American goods, and wish to negotiate with manufacturers seeking Spanish markets. We shall be glad to receive catalogues, price lists, and samples of American products. Address Herrero Hermanos, Cadiz, Spain.

Downer's Anti-Incrustation Liquid.—J. W. Hamburger, Wholesale Furniture Manufacturer, Hester and Elizabeth Sts., New York, says: "Your Boiler Liquid is a success. I am using hard well water, but your Liquid prevents the formation of scale, and my tubes are clean. I shall continue to use it, and heartily recommend it to others." A. H. Downer, 17 Peck Slip, New York.

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

Best Power Punching Press in the world. Highest Centennial Award. A. H. Merriman, W. Meriden, Conn. Deoxidized Bronze. Patent for machine and engine journals. Philadelphia Smelting Co., Phila., Pa.

Having enlarged our capacity to 96 crucibles 100 lb. each, we are prepared to make castings of 4 tons weight. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Milling, Profiling, Cam Cutting, Revolving Head Screw Machines. Pratt & Whitney Co., Hartford, Conn.

Hand Fire Engines, Lift and Force Pumps, for fire and all other purposes. Address Ramsey & Co., Seneca Falls, N. Y., and 93 Liberty St., N. Y. city, U. S. A.

NEW BOOKS AND PUBLICATIONS.

ORIGIN, PROGRESS, AND DESTINY OF THE ENGLISH LANGUAGE AND LITERATURE. By John A. Weisse, M.D. New York: J. W. Bouton. 1879. 8vo, pp. 701.

If not the first, certainly the most thorough and comprehensive study of the origin, development, and verbal structure of English speech that has ever been made by scientific methods. In its preparation Dr. Weisse has studied with singular acuteness and patience the vocabularies of typical British writers in every age from the year 597 to the present, tracing the origin of the words used, and the varying percentages of words drawn by different writers in successive ages from the different sources—Anglo-Saxon, Gothic, Danish, Swedish, German, Dutch, Flemish, Welsh, Cornish, Scotch, Irish, Armoric, Greek, Latin, French, Italian, Spanish, Portuguese, Russian, Arabic, Hebrew, and Armaic—all of which have fed the grand stream of English speech. Contrary to popular notions, English as at present spoken is, in its vocabulary, about three-quarters Græco-Latin and one-quarter Gotho-Germanic or Anglo-Saxon. In other words but one-quarter of the words in use by English writers and speakers have come from the latter family of languages, and the tendency is and has been steadily toward the increasing of the percentage of Græco-Latin words. As to the destiny of the English language, Dr. Weisse believes with De Candolle that in a century or so it will dominate the world. The English speaking peoples are a multiplying, colonizing, conquering race. Already they command nearly half the world's commerce, though numbering but one-fifth the world's population. They have more books and newspapers than all the rest of the world, and more inventors and inventions. In directness, compactness, and simplicity of grammatical structure, English speech surpasses all other languages—properties which make it everywhere the language of the telegraph—and it only needs rectification as regards its spelling to be suitable for universal adoption. Dr. Weisse's book is a mine of curious and valuable information, and has made its mark as one of the few great works of the age.

MAGNETIC VARIATION IN THE UNITED STATES. By J. B. Stone, Ph. B., C. E. New York: 1878. 12mo, pp. 139. Price \$1.50.

Every practical surveyor will appreciate the advantage of a compilation of the recorded facts in relation to the variation of the compass throughout the United States. This Mr. Stone has been at great pains to make, and to supplement his tables with such information as will enable the surveyor to determine easily the allowance that must be made in any case for the difference in variation between any dates. There is added a brief account of the nature of terrestrial magnetism, the various theories as to its origin, its change in intensity, and duration, and the progress of magnetic observation. The book may be had of Mr. Stone, Boonton, New Jersey.

GRAPHICAL COMPUTING TABLE. By Lieut. William H. Bixby, U. S. A. New York: John Wiley & Sons.

It would be impossible to say, without a wide and varied series of practical tests, whether this ingenious table is a curiosity merely, or an instrument of great practical utility. The credit of its construction is given to Lalanne, French Inspector General of Bridges and Highways. It certainly enables one to arrive at the results of many complicated mathematical operations almost by simple inspection. If we had much of that sort of work to do we should not hesitate to undertake the mastery of its use. The time and labor spent on its preparation surely ought to bring some practical return. Young office workers may do well to give it a trial. The errors are said to be within one half of one per cent.

REPORT OF NEW YORK STATE SURVEY FOR 1878. James T. Gardner, Director. Albany: C. Van Benthuysen & Sons.

The field work of the past year was principally upon that part of the central belt of triangles from Albany westward, lying in the counties of Oneida, Madison, Onondaga, Oswego, Cayuga, Wayne, Seneca, and Yates. The measurements embraced an area of about 2,000 square miles, in one of the most wealthy and populous parts of the State, containing two important cities and nearly two hundred villages and hamlets. Every one of these towns was found to be misplaced from one to two miles on all existing maps.

PLASTERER'S MANUAL. By K. Cameron. New York: Bicknell & Comstock. pp. 53. Price 75 cents.

A practical little handbook describing the tools and materials used in plastering, the appearance and action of different limes and cements, methods of making and applying mortar, and giving, in small space, a large amount of information useful to plasterers. Both publishers and author have done their work well.

AN EXPOSITION OF CREATION. By Rev. Joseph Gross. Philadelphia: William Syckelmoore. pp. 135. Price 40 cents.

Mr. Gross is an aged clergyman who sticks to Genesis, literally. Genesis is right; geology clashes with Genesis, therefore geology is wrong. The logic is good. The usual custom is to assert that Genesis means what it does not say; then build up a scheme of geology resting more on imagination than on fact; then say that geology and Genesis agree. Mr. Gross is guilty of no such folly. He does not know much about geology, further than that it does not agree with a literal interpretation of Genesis i. and ii. His major premise being, to his mind, unassailable, his conclusion is inevitable. Geology and Genesis cannot be harmonized without mutual destruction. He rests on Genesis.



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) G. M. writes: I want to make an engine, 6 inches stroke and 4 inches diameter, of brass. How large should the ports and exhaust be, and how can I make the cores for the same? A. Steam port ½x2½ inch, exhaust ½x2½ inch. Consult a moulder on other points.

(2) W. P. asks: Does the upturning of virgin earth (not marshy districts) from 1 to 20 feet deep, and filling up hollows, produce malaria in any form? A. No, not in a healthy region. Still if any one in the neighborhood should afterwards suffer from an illness which the attending physician was too ignorant or too lazy to discover the cause of, the patient would probably be told that he was a victim of malaria. Malaria appears to be a convenient verbal pack-horse for a wide range of medical ignorance.

(3) G. H. O. asks (1) for a recipe for a preparation for sealing bottles that is insoluble in alcohol. A. Soften glue in cold water and melt it in the water bath to form a very thick paste. To this add good glycerine in quantity equal to the dry glue taken, and continue the heating to expel as much of the water as possible. This may be cast on a marble slab to cool, and melted for use as required. This is not soluble in alcoholic liquids. 2. Is there any liquid as good as alcohol, but cheap, for preserving insects, snakes, etc.? A. Alcohol is one of the best; a solution of arsenious acid may be employed for insects.

(4) J. S. B. writes: I contemplate putting in an engine to run my presses and heat the office. About two effective horse power will be required, and the office is about 20x40, 9 feet high. 1. Will either of the engines of the following dimensions do the work, and which will be the best? One is, cylinder, 3½x6 inches, 250 revolutions per minute, boiler of the locomotive style, diameter 23 inches; length of furnace, 23 inches; width of furnace, 18 inches; height of furnace, 16 inches; number of tubes, 18; diameter of tubes, 2 inches; length of tubes, 41 inches. The other is, cylinder, 4x6 inches, 240 revolutions per minute; boiler upright; diameter, 24 inches; height, 60 inches; number of tubes, 26; diameter of tubes, 2½ inches; length of tubes, 36 inches; grate surface, 207 square feet. A. Use the larger engine, 4x6. 2. Will it be necessary to place the boiler below the level of the heating coils? A. No, you can use a trap to return the water to the boiler. 3. Will it be of any use to attempt to utilize the exhaust steam? A. Utilize it by heating the feed water.

(5) C. L. H. asks for some method of keeping moulding clay moist for some length of time. A. Mix a little glycerine with the water.

(6) C. E. A. asks what cement to use for fastening mineral specimens to woods—as in making mineral caskets. A. Good glue or sealing wax answers very well. Thick solution of shellac in alcohol or in a hot aqueous solution of borax will also answer the requirements.

(7) E. A. R. asks how to preserve natural flowers. A. The fresh leaves are spread and pressed in a suitable dish with alternate layers of fine, thoroughly dry sand, as hot as the hand can bear. When the sand has cooled they may be removed, smoothed, and dipped for a few moments in clear French spirit varnish, and allowed to dry in the air. By many melted white wax is preferred to the varnish. This latter must not be too hot. The dried leaves are dipped in the melted wax, drawn several times over the edge of the vessel to remove excess, and hung up until the film of wax is thoroughly cooled and hardened.

(8) H. T. N. writes: I have a marine barometer and do not understand exactly what effect the atmosphere has on it to foretell rain, snow, or wind, etc. I have asked others that have them; they differ, and appear to know no more than myself. Please give rules by which the changes are indicated. A. High winds and storms are usually preceded by a sudden falling of the mercury. The approach of fine weather is indicated by the rising of the mercury. The rising of the mercury in winter indicates frost; in frothy weather it indicates snow; while its fall indicates a thaw. In

sultry weather coming thunder is indicated by the falling of the mercury. When the height of the mercury alters slowly, the kind of weather indicated will continue for a long time. If it falls, it will be foul; if it rises, it will be fair. Fluctuations in the mercurial column indicate changeable weather. These rules may be relied on in a general way. No positive rules can be given.

(9) W. H. D. asks: What will color charcoal and tallow a dark red—a good permanent dye? A. We know of no satisfactory method of dyeing charcoal red. Perhaps the admixture of a small quantity of red ochre or Berlin red with the tallow would answer the requirements.

(10) J. S. writes: I am engaged to some extent in brass casting, using old metal almost exclusively. I am unable to make sound castings, and desire some information. It is not the fault of the moulds, as I have no trouble with new metal. The trouble seems to be a sort of white scum of oxide which forms very rapidly, which, going into the mould with the metal, makes the castings porous and rotten. A. Stir the molten metal well with a stick of green wood, and sprinkle the surface with a little dry argol and sal-ammoniac before pouring.

(11) C. T. E. asks: 1. What are the ingredients and quantities for manufacturing black and brown hair dyes? A. See p. 348, Cooley's "Cyclopedia of Practical Receipts." 2. What is the best method of preparing violin rosin? A. Moisten the powdered rosin thoroughly with turpentine spirits, agitate with about ten parts of water, and boil the milky liquid for an hour. Filter dry, and fuse the residue at a gentle heat.

(12) J. C. W. writes: In the May 10th number of the SCIENTIFIC AMERICAN, under "Notes and Queries," W. A. B. asks how to procure powdered silver such as is used in the Right telephone. You suggest a mechanical process. I beg leave to offer the following, which is mainly an old chemical method, and may or may not answer the requirements of W. A. B.: Make a solution of nitrate of silver by dissolving the crystallized salt in pure distilled water, and of such strength as that about 60 grains shall be in one gallon of the water. By making the solution stronger or weaker, more or less coarseness of the powder will result. After solution is made immerse in it a strip or strips of clean copper sheet, and set the whole aside for about 24 hours, when the silver will have been precipitated upon the strips of copper in a finely divided metallic state. I am inclined to the opinion that frequent or constant agitation of the liquid will produce a better result than if the precipitation is allowed to proceed undisturbed, but cannot say positively that it will. After the action is completed shake or agitate the vessel so as to detach the loosely adhering coat of silver from the copper strips, and having removed the latter, collect the silver by filtering the liquid through paper, rinsing all the precipitate into the filter. After the water has passed wash the precipitate with water containing one or two per cent of aqua ammonia until all the copper (or cupric nitrate) is removed from the silver powder. Any accidental chloride of silver will be thus removed also. Then let the water drain out of the filter until it ceases to drip, when a continuation of the washing may be resumed, using strong alcohol. This will displace most of the water. After this wash out the alcohol with stronger ether or ether containing no water, then expose the filter (opened freely to the air) to a warm temperature, avoiding the approach of flame, for fear of setting fire to the ether. The precipitate will dry rapidly and may be easily rubbed to a fine soft metallic powder by passing through a fine sieve.

(13) S. M. L. writes: 1. I wish to construct a wheel seven inches in diameter and two inches thick. The wheel runs diametrically, one half in vacuum and one half in open air. The wheel sits horizontally, the shaft being vertical. The distance between bearings is about five inches. What is the smallest sized iron or steel shaft I could use with safety? I estimate the side pressure to be about 210 lbs. A. 9-16 inch. 2. If a tube be placed in water, and the air exhausted from the tube, the water will rise about 30 feet. If a turbine wheel were placed in the tube, about on a level with the surface of the water, would the water exert a force on the wheel equivalent to a fall of 30 feet in open air, supporting the weight of the water above the wheel to be taken off? A. No. 3. Is there any safe rule for estimating the horse power of turbine wheels under a given pressure, and the number of revolutions they will make, and the amount of water they will pass, in a given time? A. Turbine manufacturers have such rules. 4. Can you name a good reliable history of the attempts to invent perpetual motion machines, one which gives sketches and descriptions of the most important plans that have been devised by inventors? A. "Perpetuum Mobile, or Search for Self Motive Power," by H. Dircks.

(14) C. A. S. writes: In the SCIENTIFIC AMERICAN, page 230, volume 38 (April 13, 1878), is given a process for copying tracings by the aid of photography. It is claimed that this process will give a copy in dark (deep blue) lines on a white ground. I have repeatedly tried the process, over and over again, but have not yet succeeded in getting the result desired. The best result I can get is a copy of dark blue lines on a nearly equal lighter than the drawing, however long I may leave the paper exposed to the light. Will you please inform me what the trouble is? A. Potassium ferrocyanide produces in solutions of the ferrous (proto) salts a bluish white (nearly white) precipitate, which by absorption of atmospheric oxygen speedily acquires a distinct blue color. The remedy is obvious—shorten the time of exposure to the air, dilute the solutions employed somewhat, and wash thoroughly immediately after exposure.

(15) R. V. H. asks: How can I make a silvering solution so I can apply with a cloth and have a silver plate? I have a recipe but it rubs off with the hand. The recipe is as follows: 2 drachms nitrate of silver; 4½ drachms water; 1 drachm sal ammoniac; 4 drachms each chalk and soda. A. The silver deposited in this manner is a mere wash and cannot be expected to stand much handling. A better wash than the one referred to is prepared as follows: Dissolve ½ ounce silver nitrate in a small quantity of water, warm, agitate this with about