

they lose their fat and get thin. Man himself gets fat in summer and grows thin in winter from the demand on this store for heating purposes. Hibernating animals go to their winter sleep sleek and fat, but wake up in the spring lean and meager, from the loss of fat in maintaining the animal heat necessary for life. Fat is thus seen to be an essential of animal life. Where there is too little deposited for the purposes of life, then serious disease has already commenced or may set in; while on the other hand a redundancy of this deposit may seriously interfere with the functions necessary to life.

It is from this point of view that the value practically of a knowledge of the height and weight of individuals becomes apparent. When the weight of a person is much below his height, then it may be suspected that some disease has set in, which may go on to the destruction of life. One of the earliest symptoms of consumption, the most fatal disease of the civilized inhabitants of Europe, is a tendency to loss of weight. Long before any symptoms are present of tuberculous deposits in the lungs, this loss of weight is observable in persons afflicted with consumption. And at this stage a large amount of evidence renders it probable that the fatal advance of this disease may be prevented.

Within the last thirty years a practice has been resorted to with great success of administering to persons losing weight and threatened with consumption, cod-liver oil, pancreatic emulsion, and fatty substances, as articles of food, for the purpose of preventing or arresting the tendency to loss of fat, which obviously results in the production of fatal disease. In fact, it may be stated generally, not without exceptions, that wherever the weight is much below the height, there the commencement of dangerous disease may be suspected, and precautions taken to prevent the loss of fat. That this treatment has been successful in really preventing disease, and loss of life as the consequence, is the conviction of a host of intelligent practitioners of medicine. At the same time, it should be remembered that it is not only necessary in these cases to administer cod-liver oil or pancreatic emulsion as medicines, but that the consumptive should have recourse to a fatty diet, and should eat butter, cream, cream-cheese, fat and fatty articles of diet.

**Obituary.—Samuel V. Merrick.**

It is with great regret that we are called upon to record the death of Mr. Samuel V. Merrick of Philadelphia, Pa., the Founder and President of the Franklin Institute, and for many years an esteemed client of this office. A man of inflexible integrity, liberal culture, and great business capacity, he has for a long time been one of the most honored of the citizens of Philadelphia. His connection with the Franklin Institute has made his name familiar to the scientific world.

A meeting of the Board of Managers of the Institute was held to notice his death, and a series of highly complimentary resolutions were passed in relation to the character and acts of the deceased.

We also notice the recent death of T. A. Wasson, the well known car builder, at Springfield, Mass.

**Province of Quebec Fair.**

The Province of Quebec Fair of 1870, will be held at Montreal, Sept. 13, 14, 15, 16. \$15,000 prizes.

American exhibitors are admitted on the same footing as Canadians. An entrance fee of one dollar covers all entries and entitles the exhibitor to four tickets to the grounds. Custom duties to be refunded. It is expected that American manufacturers, stock breeders, etc., will be fully represented. Entries for implements, etc., on or before the 3d September. For further particulars apply to the Secretary, Council of Agriculture, Montreal.

**Ridicule.**

Sometimes our correspondents make the mistake, in their replies to published letters, of attempting to heap ridicule upon the opinions expressed by other correspondents who happen not to agree with their theories. We are obliged to decline all such letters. Abuse is one thing, fair criticism is quite another, and the latter only is acceptable to us.

**WATERING STREETS WITH SALINE SOLUTIONS.**—It is stated that, of the two deliquescent salts which have been applied for this purpose—viz, the chlorides of magnesium and calcium—the last-named suits best, the quantity being adjusted at one half a pound per square yard. In 1860 and 1863, the Place Bellacour, at Lyons, France, was (experimentally, and during great heat) watered with a mixture of chloride of calcium and commercial hydrochloric acid, properly diluted in water, the effect being highly appreciated by the inhabitants also on account of the perceptible purification of the air.

How perfectly almanac makers hit it, was verified in the weather word in one of the almanacs against the second Sabbath in August. "Scorching" was its prophecy. It was about the only Sabbath that was not scorching, and was the only one to which it applied that epithet. Thick clothes were its uniform. The almanac guessers should employ better mediums.

CANADIANS can now apply for patents in the United States upon the same terms as citizens. Full information can be obtained by applying to the publishers of the SCIENTIFIC AMERICAN.

In the year 1811 Kirchoff, a celebrated German chemist, discovered that it was possible to convert starch, by means of sulphuric acid, into sugar.

**NEW BOOKS AND PUBLICATIONS.**

**ON MICROSCOPICAL MANIPULATION.** Being the Subject-Matter of a Course of Lectures Delivered before the Quekett Microscopical Club, January-April, 1869. By W. T. Suffolk, F.R.M.S. Illustrated with forty-nine Engravings and seven Lithographs. Philadelphia: J. B. Lippincott & Co.

The microscope and the spectroscope are now leading the way to the interpenetration of Nature's profound mysteries. Not that when all that human mind and human hands can do has been done there will remain nothing mysterious, we look for no such consummation; but to these instruments science is indebted for keys by which it has been enabled to enter whole realms of facts utterly inaccessible without them. But these keys are of but little value unless used in the proper manner. Fortunately for those unskilled, the manipulations necessary to success in microscopy can be so described in books that an intelligent person may practice the most of them after a few attempts. But that this desirable result shall be attained it is necessary that the book upon which he relies for guidance be prepared, not only by one who understands the use of the microscope in its most approved forms, but is able to convey his knowledge and experience in plain unmistakable language. The book under present consideration is written by a man who ranks high among the many accomplished English microscopists. This is a sufficient guarantee that his knowledge and experience are ample for the task he has undertaken. The pages of the book bear the evidence of his ability as an instructor. The book contains seven chapters, with an appendix and notes, containing full information upon the construction of the instrument, its various parts, their uses, and adjustments; the mechanical processes of glass cutting, drilling, bending, and working of tubes; how to select the various tools and implements, and to keep them in perfect order; how to mount objects dry, in balsam, and in fluid; illuminating apparatus, comprising all the most approved devices for this purpose; polarized light, and its uses in microscopic examination; drawing and micrometry, etc.; six lessons upon the examination of various representative substances, with notes upon various collateral subjects connected with the art of microscopy. The work is handsomely printed and bound, and is really the most practical and complete manual for beginners in this delightful field of science we have ever met with.

**THE PRACTICAL AMERICAN MILLWRIGHT AND MILLER.** Comprising the Elementary Principles of Mechanics, Mechanism, and Motive Power, Hydraulics and Hydraulic Motors, Mill-Dams, Saw Mills, Grist Mills, the Oat-Meal Mill, the Barley Mill, Wool Carding and Cloth Fulling and Dressing, Windmills, Steam Power, etc. By David Craik, Millwright. Illustrated by numerous Wood Engravings and Folding Plates. Philadelphia: Henry Carey Baird, Industrial Publisher, 406 Walnut street. 1870. Price, by mail, free of postage, \$5.00.

See notice in editorial columns.

**Answers to Correspondents.**

**CORRESPONDENTS** who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

**SPECIAL NOTE.**—This column is designed for the general interest and instruction of our readers; not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$1.00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

M. G., of N. Y., asks whether there would be any power gained by placing a turbine wheel higher in the draft-box—or tube which conveys water to the wheel—than the height to which atmospheric pressure will sustain a column of water in a tube from which the air is exhausted, at the locality in which the wheel is placed, say, as an outside figure, thirty-three and one third feet above the tail water. We answer, that as all the water below the wheel can do, is by its weight and motion in falling to overcome the pressure of the atmosphere against the flow of the water through the wheel (the same as the condensation of steam in the steam engine removes the pressure of the atmosphere from the advancing piston) it is evident that when the wheel is placed at a height sufficient to secure this action below the wheel, nothing can be gained by placing it higher. On the contrary, loss must result, from the diminished head above the wheel. In fact there can be no gain in placing the wheel above the level of the tail water, although it may for convenience be raised, without loss, within certain practical limits, varying somewhat with circumstances, but always less than the theoretical height above specified.

T. S. K., of Ill., and several others, write in regard to the balancing of shafts and pulley systems, all agreeing that pulleys should be balanced separately, if they are to be run together, and also that the heaviest sides should be placed opposite each other on the shaft, so that centrifugal force shall act equally on opposite sides. This would not of course work where the number of pulleys is odd, and each required balancing; nor would it answer in all cases where the number of pulleys is even, as some may need more counterpoising than others. Most agree that the shaft should be large enough so as not to spring by the tension of the belt. One correspondent, however, erroneously thinks this of little consequence. For ourselves, we still adhere to the opinion that where pulleys have wide faces, and thin rims, they should have more than one spider, and the spokes ought also to alternate, so as to prevent springing of the rim. We also would make the arms of the spider straight and radial, instead of bent, or tangential to the hub, as is often done, as we believe a pulley unevenly weighted at the rim, and running at high speed, will maintain its shape better with straight, radial arms.

W. H. S., of Va.—Thin rubber, of the kind you describe, and used for tying over the tops of jars, as well as for other purposes, may be obtained at all the dealers in rubber goods. It is, however, not wholly impervious to water when long immersed, and gases will also pass through it. It will not do to seal fruit jars in this way, unless the fruit be preserved in sugar "pound for pound," according to the old rule, in which case a loose cover will be as serviceable as the rubber.

J. D. B., of Pa.—It is impossible, without knowing the exact consistency of the varnish you have invented, to advise you what material added to it will make it dry more rapidly. If the vehicle is alcohol, it ought to dry quickly without such addition; if siccativ oils are used, acetate of lead or litharge will make it dry quicker.

H. B. D., of O.—Wheels for ordinary canceling presses are made of composition, and cannot be used for perforating. Perforating stamps should be made of steel, and hardened, and it is better to make the figures separate, and set them in, so that in case of falling or breaking, they can be taken out and replaced.

H. W. G., of Mich.—To clean brass or silver, and polish the same, use aqua-ammonia and rotten stone, followed by rouge, applied with soft leather.

D. S., of Md.—The steam plows in use in this country are very few, and, so far as we know, have been imported from England. We do not think they can be obtained in this country.

F. H., of N. Y.—What is called "lodestone" is simply a species of magnetic iron ore.

G. L., of Kan.—We cannot give you the address of an emery and crocus cloth manufactory.

S. S. H., of Ala.—English flint glass expands 1 part in 1,248 in length, and 1 part in 316 in bulk, in heating from 32° Fah. to 212° Fah. Brass expands under the same treatment 1 part in 536 in length, and 1 part in 179 in bulk. Iron, 1 in 846 in length, and 1 in 282 in bulk. These substances will expand nearly in the same proportions for higher temperatures below the point of fusion. Brass melts at 1,650° Fah. Iron at from 1,920° Fah. to 2,910°. Glass requires a very high temperature to fuse it to anything like fluidity. It, however, becomes soft and plastic at a red heat. It varies much in this respect, according to composition, that containing soda being more fusible than those containing potash.

J. F. G., of Mass.—In computing the power and resistance that will produce equilibrium in hydraulic presses or accumulators, it is the areas of pistons only that is taken into account, the areas of the supply pipe sections have no bearing upon the subject, other than that if too small they will increase the friction.

**Business and Personal.**

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4.00 a year. Advertisements 1c. a line

For Sale—One half the interest in McGee's Patent Self-boring Faucet. Address T. Nugent, Morristown, N. J.

The best selected assortment of Patent Rights in the United States for sale by E. E. Roberts & Co., 15 Wall st., New York. See advertisement headed Patentees.

Wanted—A good Steam Engine of from 80 to 100-H. P. Address, with particulars, Box 1969, New York.

Every Reader of the Scientific American, who will send his address to S. R. Wells, 389 Broadway, New York, with 15c., will receive a specimen of The Phrenological Journal, a first-class Family Magazine published at \$3 a year, 20 cents a number.

John Dane, Jr., Newark, N. J., builds the best Hand Lathes slide rests, presses, all kinds, Jeweler's rolls, models, dies, all kinds of light machinery and work, to order. Send for circular.

Six new and perfect Automatic Gas Generators, Wood's Patent at a low price. Or will sell the air pumps alone. Address David Street, 273 Franklin st., Cleveland, Ohio.

Owners of Worthington Pumps can hear of something to their advantage by addressing Jno. Clark, Water Works, Harrisburg, Pa.

Crampton's Imperial Laundry Soap, washes in hard or salt water, removes paint, tar, and grease spots, and, containing a large percentage of vegetable oils, is as agreeable as Castile soap for washing hands. "Grocers keep it." Office 84 Front st., New York.

Enterprising men wanting a genuine Patent Monopoly, please address, immediately, C. H. Hudson, 174 Washington st., New York.

Wanted—Salesman in the mechanical branch of business. Only experienced need apply at S. Firuski & Co.'s, 20 Cedar st., New York.

See advertisement on New Work on "Soluble Glass," published by Dr. L. Feuchtwanger, 55 Cedar st., N. Y. Price \$3.12, mailed free

Dickinson's Patent Shaped Carbon Points and adjustable holder for dressing emery wheels, grindstones, etc. See Scientific American, July 24th, and Nov. 20, 1869. 61 Nassau st., New York.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

"507 Mechanical Movements."—Over 18,000 copies of this book have been sold. This is by far the largest illustrated table of movements ever published. An invaluable aid to mechanics, inventors, etc. Price \$1. By mail, \$1.12. Address Theo. Tusch, 37 Park Row, New York.

Best Boiler-tube cleaner—A. H. & M. Morse, Franklin, Mass.

A Good Machinist, with about \$3,000, can have an interest and entire charge of a paying manufacturing business. Address Machinist, Box 507, Baltimore, Md.

Tools and Machines for special uses built to order. Chas. N. Trump, Port Chester, N. Y.

For Sale or to Lease—A never-failing water-power at Ellenville, N. Y., 1/2 mile from depot of the Ellenville Branch N. Y. and O. Midland R. R., and only 80 miles from New York city, by rail. For full particulars address Blackwell, Shultis, Gross & Co., Kingston, N. Y.

Gatling Guns that fire 400 times per minute are now made at Colt's Armory, Hartford, Conn. Send for pamphlets.

Pictures for the Library.—Prang's latest publications: "Wild Flowers," "Water Lilies," "Chas. Dickens," Sold in all Art Stores.

Japanese Paper Ware—Spitoons, wash basins, pails, milk pans, etc. Perfectly water-proof, and will not break or rust. Send for circulars. Jennings Brothers, 353 Pearl st., New York.

"Your \$50 Foot Lathes are worth \$75." Good news for all. At your door. Catalogues Free. N. H. Baldwin, Laconia, N. H.

The Best Hand Shears and Punches for metal work, as well as the latest improved lathes, and other machinists' tools, from entirely new patterns, are manufactured by L. W. Pond, Worcester, Mass. Office, 98 Liberty st., New York.

Wm. Roberts & Co., Designers and Engravers on Wood, 36 Beekman st., New York, would respectfully announce that they are now prepared to receive orders from Manufacturers, and others, for engraving of machinery, views of stores, factories, trade marks, etc., etc.

One 60-Horse Locomotive Boiler, used 5 mos., \$1,200. Machinery from two 500-ton propellers, and two Martin boilers very low. Wm. D. Andrews & Bro., 414 Water st., New York.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Keuffel & Esser, 116 Fulton st., N. Y., the best place to get 1st-class Drawing Materials, Swiss Instruments, and Rubber Triangles and Curves.

For tinmen's tools, presses, etc., apply to Mays & Bliss, Plymouth st., near Adams st., Brooklyn, N. Y.

Glynn's Anti-Incrustator for Steam Boiler—The only reliable preventative. No foaming, and does not attack metals of boiler. Liberal terms to Agents. C. D. Frederick, 587 Broadway, New York.

Cold Rolled—Shafting, piston rods, pump rods, Collins pat. double compression couplings, manufactured by Jones & Laughlins, Pittsburgh, Pa.

For mining, wrecking, pumping, drainage, and irrigating machinery, see advertisement of Andrews' Patents in another column.

It saves its Cost every sixty days—Mitchell's Combination Cooking Stove. Send for circular. R. B. Mitchell, Chicago, Ill.

To ascertain where there will be a demand for new machinery or manufacturers' supplies read Boston Commercial Bulletin's manufacturing news of the United States. Terms \$4.00 a year.