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. Hybernating animals go to their store for heating purposes. Hybernating animals go to their
winter sleep sleek and fat, but wake up in the spring lean winter sleep sleek and fat, but wake up in the spring lean
and meager, from the loss of fat in maintaining the animal and meager, from the loss of fat in maintaining the animal heat necessary for life. Fat is thus seen to be an essen tial 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 hight and weight of individuals becomes apparent. When the weight of a person is much below his hicht, 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 eivilized 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 aflicted 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 hight, there the commencement of dangerous disease may be suspected, and precautions taken to prevent the loss of fat. That this treat ment 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 tire 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 Mir. 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 bas 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 sharacter 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 Ruebec 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, ets, 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 atterapting 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 witi Saline Solutions.-It is stated that, of the two deliquescent salts which have been applied for this purpose-viz., the chiorides 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 weaiger word in one of the almanacs against the socond 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 applicd 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 18I1 Kirchoff, a celebrated German chemist, discovered that it was possible to convert starch, by means of sulphuric acid, into sugar.

## NEW BOOKS AND PUBLICATIONS.

Microscopicat، Maniptchation. Being the Subject-Mat ter of a Ceurse of Lectures Delivered before the Queket
Microscopical Club, January-April, 1869. By W.T. Suf folk, F.R.M.S. Illustrate with forty-nine Engraving and seven Lithographs. Philadelphia: J. B. Lippincott
$\&$ Co.

The microscope and the spectroscope are now leading the way to the in-
erpentralia of Nature's profound mysteries. Not that when all that human mind and human hands can do has been one there will remai nothing mysterious, we look for no such consummation; but to these in struments science is indebted for keys by which it has been enabled to
enter whole realms offacts utterly inaccessible without them. But thes keys are of but little value unless used in the proper manner. Fortunately or those unskilled, the manipulations.necessary to success in microscopy an be so described in books that an intelligent person may practice the ost of them after afew attempts. But thatthis desirable result shall 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 unmistakablé 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 knowledg and experience are ample for the task he has undertaken. The pages of
the book bear the evidence of nis ability as an instructor. The book contains seven chapters, with an appendix and notes, containing full informa tion upon the construction of the instrument, its various parts, their uses,
and adjustments; the mechanical processes of glass cutting, drilling, and adjustments; the mechanical processes of glass cutting, drilling,
bending, and working of tubes; how to select the various tools and implebending, and working of tubes; how to select the various tools and imple ments, 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 exanination; drawing and micrometry, etc.; six lessons upon the examin ation of various representative substances, with notes upon various
collateral subjects connected with the art of microscopy. The work is collateral subjects connected with the art of microscopy. The work is
handsomely printed and bound, and is really the most practical and handsomely printed and bound, and is really the most practical and
complete manual for beginners in this delightfulfield ot science we have ever met with.
'The Practical American Millwright and Milier Comprising the Elementary Principles of. Mechanics, Mechanism, and Motors, Mill-Dams, Saw Mi'ls, Grist Mills, the Oat-
Meal Mill, the Barley Mill, Wool Carding and Clath Fulling and Dressing, Windmills, Steam Power, etc. By David craik, Millwright. Illustrated by numerous Wood Caravings and Folding Plates. Philadelphia: Henry Carey Baird, Industrial Publisher, 406 Wa
1870 . Price, by mail, free of postage, $\$ 5.00$.
See notice in editorial columns.

## Aucurry to Correfuntents.



All reference to back numbers shoula be by bolume 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 hight to which atmospheric press-
ure will sustain a column of water in a tube from which the air is ex hausted, at the locality in which the wheel is placed, say, as an outside fore, 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 ad vancing piston), it 18 evident that when the wheel,is placed at a hight suff cient to secure this action below the wheel, nothing can be gained by placing it higher. On the contrary, oss must result, Irom the dminished 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 hight above with circu
T. S. K., of III., and several others, write in regard to the bal ancing 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 tha centrifugal force shall act equally on opposite sides. This would not
course work where the number of pulleys istodd, and each require 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 little consequence. For ourselves, we still adhere to the opinion that
where pulless have wide faces, and thin rims, they should have more than one spider, and the spokes ought also to alternate, so as to preven springing of the rim. We also would make the arms of the spice
traight and radial, instead of bent, or tangential to the hub, as is ofte done, as we believe a pulley unevenly weighted at the rim, and running thigh speed, wilman 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 purposcs, may be impervious to water when long immersed, and gases will also pass throngh 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 astithe rubber
J. D. B., of Pa.-It is impossible, without knowing the exact consistence of the varnish you have invented, to advise you what
materialadded to it will make it dry more rapidy. If the vehicle is alcohol, it ought to dry anickly without such addition; if siccative 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 fig ures separate, ancl set them in, so that in case of falling or break
ing, they can be taken out and replaced.
I. W. G., of Mich.-To clean brass or silver, and polish the same, use aqua-nmmonia and rotten stone, followed by rouse, applied
D. S., of Md.-The steam plows in use in this country are very few, and, so far as we know, have been importe from England. We do not think they can be obtained in this country.
F. H., of N. Y.-What is called "lodestone" is simply
G. L., of Kan.-We cann:ot give you the address of an emery
S. S. H., of Ala. - English flint glass expands 1 part is 1,248 in length, and 1 part in 316 in bulk, in heating from $32^{\circ}$ Fah. to 212
Brass expands under the same treatment 1 part in 536 in length, Brass expands under the same treatment 1 part in 536 in length, and 1 pal
in 179 in bulk. Iron, 1 in 846 in length, and 1 in 282 in bulk. These sul stances will expand nearly in the same proportions for higher temper tures below the point of fusion. Brass melts at $1,650^{\circ} \mathrm{Fah}$. Iron at from $1,920^{\circ}$ Fah. to $2,910^{\circ}$. Glass requires a very high temperature to fuse it to
anything like fiuidity. It, however, becomes soft and plastic at res. anything like fiuidity. 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 equiliorium in hydraulic presses or accamulators,
the areas of pistons only that is taken into account, the areas of the sup ply pipe sections have no bearing upon the subject, other than that if too small they will increase the friction.

## Wixitues ant ersmat.

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