A SQUASH IN HARNESS.

Some accounts of the lifting power of a vegetable in its growth, as determined from week to week by putting a peculiar test upon a squash, have been published from time to time, but the whole progress of the experiment was detailed by President Clark, at a late meeting of the Massachusetts State Board of Agriculture, in a lecture on "Plant Growth." We take the account from the report in the *New England Farmer*:

It had been known for a long time that plants exerted considerable force during their growth. Beans, acorns and other seeds lift an amount of weight, as they rise up from the soil in the early stages of their growth. Mushrooms have been known to lift flag stones weighing eighty pounds from their bed in garden walks, and shade-trees in our streets frequently lift the pavements, and even crowd in basement walls under our houses, with their roots. The force measured in a black birch was equal to raising a column of water eighty-six feet, while the sap was in motion. The idea was conceived at the Massachusetts Agricultural College of measuring the force of a growing plant, and a squash was selected as a subject for such an experiment. It seemed to be the most available of anything we could try. So, last spring, a bed of rich compost was prepared and placed in one of the glass houses at the College, where observations could be made night and day through the summer, and during all weather. The soil was placed in a large, tight box or tank, in which the roots were made to stay, and during some of the stages of the squash's growth it was watched, and hourly observations made and recorded, for a whole week at a time

Squashes are made up of fibrous tissues: the outside fibres run lengthwise, then another set, like bands, cross these, holding the squashes together the other way, and then, on the inside, is another set running lengthwise, to which the seeds are attached. (The *unharnessed* squash was now exhibited, showing unmistakable signs of having been driven in a harness much too small for it.) A strong box had been prepared to receive it, with boards set edgewise in the bottom, on which the squash was laid, like a baby in its cradle, but unlike the baby it was told to lie there during its entire growth to the period of mature squashhood. Iron bolts and straps easily secured the cradle, but something must be done to keep the growth from rising, or if it did rise, to indicate the power exerted. An iron grate or harness, made open to admit light and air, as the squash would rot in a tight closed box, was formed in shape similar to the saddle of a cart harness. This was placed over the squash and weights placed upon it, first a light one, then, as it was lifted by the growth of the squash, a heavier one was laid on—25 lbs, then 50, next 100, then 200, and after that 200 at a time.

It soon became difficult to find weights or room for them. The saddle got full. Then an inch bar of steel was arranged on the principle of steelyards; one end being fastened down to the cradle bed of the squash, and at one foot from the end, or just over the middle of the squash, a bearing was made, and beyond this bearing, weights were hung, as weights are hung upon a weighing bar. Weights were piled on till the bar broke. Then a chestnut timber 5x6 inches, good and sound, was put in place of the broken bar, and loaded with bags of sand and anvils till it held six of the latter, and as many of the former as there was room for. Still the squash grew, and as it grew, it raised the sand and anvils one after another as they were piled on, until one morning the timber was found broken under its weight, but the squash all right and increasing in size hourly. A heavy, wide cart-tire was bolted on to the next lever, used for stiffening it, and this one lasted till the harness crushed in the shell of the squash, in one or two of its bearings. Thus ended the experiment of testing the vital force of a growing squash. At this time it had tipped the beam under the weight of two tons and 120 pounds, and had carried on its back, but without lifting it, a load of 500 pounds for ten days.

Many harness galls were made during the trial, but in every instances the squash healed itself in a short time, and came out healthy at last with perfectly formed plump seeds and a cavity in each half, when cut—as it was before the audience—large enough for a large sized hen's nest. The meat or rind of the squash was about three inches in thickness, and by estimation contained sixty-four thousand millions of cells, each of which had been formed from sap prepared by the leaves of the vine, and carried through the vine and stem of the squash itself, with instructions to appropriate as best it could under the circumstances. The force exerted by the vital power of the vine was sufficient to raise a column of water forty-eight feet high in forty-eight hours, at the end of which time it burst.

And now what is the use of all this? Simply this: We have asked Nature a simple question, and she has given us a correct answer. There has been much dispute about the question whether trees grew except at the extremities, and important law cases have grown out of it. Parties on both sides were sure they were right, but the weight of evidence was nearly all against the theory of elongation except at the ends of the new wood. The story of the filbert tree growing up through the centre of a mill-stone, and finally, by its growth, suspending the stone several inches in the air, was not generally credited. Our investigations prove that similar effects are produced every year, by every tree which grows, and that this rising of the tree is necessary to its own preservation. Under the influence of winds which sway our trees to and fro, during their growth, the roots must be loosened in the soil and partially prevented from holding the tree securely in its place.

Now for the remedy. Each year, as the tree grows, it lays on a ring of new wood entirely around every part, not only of the top, but of the roots also. It cannot build on the under side of all these roots unless it lifts the tree from its bed, or crowds the soil away from underneath, to make room for the new cells it is bound to carry there. Finding it easier to lift the tree than to sink the world, the tree is accordingly raised each year, by just so much as the thickness of the new wood, which is laid upon the under side of the roots: And now the beauty of the arrangement is seen, when we discover that this added yearly growth is just sufficient to take up the slack in the roots caused by the rocking of the tree during storms and winds. The tree is thus securely tightened and anchored in the soil every year anew.

HOW TO PROLONG LIFE.

BY THE REV. JAMES M. BUCKLEY.

The attempt is often made to carry on at the same time three different modes of effort, any one of which is sufficient to employ the whole force which an ordinary constitution can generate. Thus we find men who are authors and students, practical business men and great travellers. They are in their office by day, they make addresses in the evening, and travel all night, often writing on the cars.

Every popular man is in great danger of excess. He becomes heated by his own work; he works with delight to himself; his friends love to hear him; ambition spurs him; the cause he advocates becomes in his eyes all-important; he assumes responsibilities and contracts engagements which tax him to the utmost; and when his powers need rest he feels that he cannot take it, and either breaks down, is compelled to give up, or dies. And the more serious a man is, the more likely he is to overdo and destroy himself. There are certain errors into which most intellectual and sedentary men are prone to fall.

1. Neglect of exercise. Many do nothing but walk a few hundred yards per day, which they dispense with in storms or when the walking is bad, which in the case of ministers, with Sundays added, is, in this climate, about two-thirds of the time.

2. An attempt to cheat nature by such subterfuges as "health-lifts." A poor sedentary man, who needs light, air, rest and change of scenery for his eyes, and fancies that he can keep at books or study all day and then in ten minutes' lifting of heavy weights set his system right, must be classed with the people who expect to get rid of the consequences of life-long violation of the laws of health by a few doses of patent medicine. And a man who can believe that men whose professional life makes them liable to heart or lung disease can safely practice lifting heavy weights is possessed of "great faith." A strong, vigorous man may not be injured by lifting (and may enjoy it much), while some weak men may have been benefited; but to rely wholly or chiefly on ten minutes' lifting is the greatest hygienic absurdity of modern times.

3. Over-feeding is a great error, especially when connected with inactivity. The Arabs have a proverb that "Fat and inaction are the cause of the principal diseases and vices of horses." And a dyspeptic minister gorging the system with rich food and taking no exercise, is a spectacle to make only infidels and undertakers rejoice. It was gravely proposed to inscribe on the tombstone of a gluttonous young minister, who was cut off by disease induced in this way, "Died of going out to tea."

4. Forgetting the danger of exposure or a strain after forty-five years of age causes many failures. The farmer, sailor, and mechanic is, if well to begin with, and temperate through life, as strong at fifty-five, and often at sixty, as he ever was. But not so the sedentary man whose rebuilding has gone on under debilitating influences. He may outlive the farmer, but he must begin to be careful physically long before such care is necessary for the out-door laborer. And many by forgetting this have in a day broken themselves down who might have lived to four-score. In contrast with these errors I place the following hints:

1. Night travel and day work should not follow each other. God does not command it, nature is incensed and outraged by it, and nothing is to be gained by it.

2. Students, teachers, ministers, lawyers, editors, and physicians should exercise the arms and chest at least half an hour a day, and spend three times as long in the open air.

3. They should sleep all that the system can endure without injury, and if they lose sleep in the night should chase it when possible all that day, till the balance is adjusted.

4. For some weeks in every year they should return to a life of nature. The man who takes cold from the motion of a fan can, after he has camped out three days, sleep on a rock in a shower and only feel a little stiff when he wakes.

5. Keep one day in seven as a day of total cessation from ordinary thoughts and work.

If it be asked what "centenarian" writes these words, I answer they are written by a man whose father died at thirty-seven, when he might, with a proper regard to the laws of health, have survived to seventy. And, again, they are written by a man who has made most of the mistakes herein portrayed, and after going down into the jaws of death has come up to excellent working condition under a natural system, and who hopes to benefit those whose love of work leads them astray, and not to encourage the indolent and the useless.—*Methodist.*

PRESERVE THE WOODS.

Already reports have been received of destructive freshets in the West. Before the large accumulation of snow is removed, there is reason to believe that generally along the large rivers and their tributaries throughout the United States there will be great loss from inundations this year. What adds to the anxiety which prevails in the low-lying lands on the basins of the grand natural drainage systems of the country is that there is little which can be done speedily to prevent the fury of the floods from carrying away bridges, mills, barns and dwellings. For many years the people have been endeavoring, unconsciously no doubt, to add to the violence of freshets by cutting down the forests. It is well known that trees, when growing on slopes, serve to retard the water from melting snow, so that it finds its way slowly to the streams, and thus a thaw has not the effect of sending the whole of the snowfall of perhaps several months at once into the channels of the streams. But where the land is denuded of timber there is nothing to impede a vast volume of water being suddenly discharged into the rivers, causing them to burst their bounds and banks, and carry destruction along their whole course.

Whether the next snows will or not disappear without doing danger, the advocates of forest culture should persevere in their efforts to induce the farmers to plant as many trees as possible. The demand for timber is every year becoming greater as the population increases. There is a probability also that wood will again to a large degree recover its position as a material for shipbuilding, from which it had been driven within the last decade. Thus the country must make provision to meet the increased demand. Droughts and fierce rainfalls accompanied with violent hurricanes are believed to be of recent years much more common in this country than when the fine forests acted as guardians of the soil. It is also certain that in hot weather dense woods by condensing vapor from the atmosphere, and liberating the winter stores of moisture from their recesses, exert a beneficent irrigating influence upon the more open and cultivated land, besides, serving as a shelter from violent winds.

Thus, then, at all seasons trees are practically useful. But, surely, their beauty, and the grandeur they impart to the landscape, plead powerfully in favor of their general cultivation. Private persons and societies of various kinds have begun to bestir themselves to clothe denuded districts with woods, and their success thus far has been very gratifying. Congress and State Legislatures have also united to offer inducements to farmers and others to plant and grow forest trees. By and by, the land will have its due proportion of woods and cultivated fields; but, until then, let the trees be preserved wherever possible.—*N. Y. Witness.*

— According to *The English Mechanic* cast iron may be best preserved from rust "by heating till if touched with fat it causes it to frizzle" and then plunging into a vat of mixed oil and grease. It is said that "the oleaginous matter actually penetrates the pores and prevents oxidation for a very long time, while it does not prevent painting, if desirable, afterward."

DOMESTIC.

— Parents, above all things, says ex-President Hill, of Harvard College, should have regard for the physical capacities of children. No machinery is so delicate in its structure, or is called on to produce work so fine, as the brains of school children. Their capacities of endurance are very limited at the age when the faculties are developing. There is more danger to be apprehended from long continuance in study than from close application for a brief period. In this particular half is better than the whole.

— If you would govern well, have but few general rules, but steadily adhere to these. Do not have a rule and a penalty for every act of childish forgetfulness or carelessness; for leaving the door open, for letting a dish fall, for playing too boisterously, for asking questions when you are busy. But, have a fixed rule as to prompt obedience, speaking the truth, and all moral duties; and never pass easily by an act of wilful disobedience, or a lie, or a theft. No matter if you are in ever so great a hurry, stop, and attend to this. It is infinitely more important than your ordinary affairs. Make a great matter of it, for God does, and it may, one day, prove a great matter to you and your children.

Potato Cakes.—Take mashed potatoes, flour, a little salt, and melted butter—to make them sweet, add a little powdered loaf sugar,—mix with just enough milk to make the paste stiff enough to roll; make it the size and thickness of a muffin, and bake quickly.

Venetian Stew.—Take one tablespoonful each of chopped onion, parsley, flour, and Parmesan cheese, a little salt, pepper, and ground mace, spread between same thin slices of veal; leave for some hours, then stew in rich broth, with a good piece of butter.

Maize Pudding.—To two cups of cold boiled hominy add three cups of chopped apple, the juice of two small lemons, one-third of a cup of sugar, and two-thirds of a cup of Zante currants. Mix very thoroughly, being sure not to have any lumps of cold hominy. Bake one hour or more in a moderate oven, or until of a light brown. Serve cold. Good for lunches.

Bread-and-Butter Pudding.—Butter a pie-dish well, and strew the bottom with currants and candied-peel, then place alternate layers of bread and butter, in rather thin slices, and peel and currants, until the dish is nearly full—observing to have currants at the top;—then pour over slowly a custard of sweetened milk and an egg or two, and bake in a moderate oven for twenty minutes.

Minced Veal, with Poached Eggs.—Take some remnants of roast or broiled veal, trim off all brown parts and mince very finely. Fry a chopped shallot in plenty of butter; when it is a light straw-color, add a large pinch of flour and a little stock; then the minced meat, with chopped parsley, pepper, salt and nutmeg to taste; mix well; add more stock, if necessary, and let the mince gradually get hot by the side of the fire. When quite hot, stir into it, off the fire, the yolk of an egg and the juice of a lemon, to be strained and beaten up together. Serve with pippets of bread fried in butter, round it, and three or four poached eggs on top.

Taste in Dress.—Many who have the cares of a household on their mind think, with Catharine of Arragon, that "dressing time is wasting time." And where the spare moments are so few and far between as with those housekeepers who not only have the superintendence of affairs but find it necessary to perform the actual labor with their own hands, the temptation to coincide fully with such authority is great. But if a woman has no natural taste in dress, delight in the combination of colors, or love of harmony in these things, she must be a little deficient in her appreciation of the beautiful. As a work of art, a well dressed woman is a study. This does not in the least necessitate a close copy of the prevailing fashions, for one must cull and choose, rejecting those unsuited to her form and general style. Even when a love of dress is natural it does not follow that it should engross every other taste. It may exist happily with an appreciation of the best there is in literature, with a fondness and successful faculty for household duties, and certainly should never be considered apart from a love of neatness and order in all things. Dress can be so adapted as to hide natural defects, and heighten the charms possessed by the wearer. From the days of Annie Beleyn, who varied her dress every day, and always wore a small kerchief around her neck to conceal a mark, and a falling sleeve to hide her doubly tipped little finger, many have made use of the advantages in this respect with success, and every woman should habitually make the best of herself and circumstances. Indifference, and consequent inattention, to dress, often shows pedantry, self righteousness, or indolence, and whilst extolled by the severe utilitarian as a virtue, may frequently be noted as a defect.—*Fireside Friend.*