might be given up almost entirely if this proposed economy were pursued. Maple willow, chestnut, and indeed almost all those of familiar growth at the North, might be utilized in this important art, to the saving of millions of dollars in this country yearly.

After the tannin is dissolved in the leaf cell, the strong decoction is ready for the vats. The pulp, thus deprived of a matter which prevents leaves from decomposing for a very long while, becomes an excellent fertilizer. Farmers make a mistake in gathering leaves into piles or mixing them with other manures, because it is a loss of time and labor, it is so long before they decompose and become food for living plants.

Thus, in contemplating the mechanism and the object of respiration, we have incontestable evidence of the positive existence of a power superior to ourselves, whose creations and whose laws declare that power to be a sovereign God.

PRESERVE THE LANDMARKS.

A matter of great importance to the farmer, and yet one which is sadly neglected, is the preservation of the government landmarks. Government surveyors establish eight "corners" to every section, and it is important to every one owning land that all these should be permanent. It is time that stakes which have stood eighteen or twenty years should be replaced. Not only are the section and quarter-stakes permitted to decay und get misplaced, but, very frequently, the "bearing trees" have been cut down, and the stumps "grubbed out." In a few years there will scarcely be 1 ft a government stake in the country; and now, when corners can easily be found, it is important that they should be preserved. If farmers would take a little time and plant stones at all the government corners of the section, much difficulty and vexation would often be avoided.

A large portion of our country is open prairie, and as there were no "bearing trees" in the original survey, it is difficult to find the old stakes; but there are hundreds of stakes that can now be found, that in three or four years will be lost beyond recovery. In the timber and grubby land witness-trees or stumps yet stand, and with the aid of the "field notes" lost corners can readily be re-established. When corners are established from other stakes, the old lines are often changed materially. For instance, a section corner in this town was established from the quarter-stakes, and afterwards, by means of the "field notes," the old stake was found two rods distant. Several different parties had dug for the old stake without success. There was but one "bearing-tree," the stump of which was found with some difficulty, and several rods from where the old stake was found six inches under ground, it being some two feet in length. There are instances where the government surveyors made still greater errors in setting quarter-stakes; and if the corners are not preserved, the lines must change. Farmers are building new fences, planting out trees, and making improvements, which will yet be found out of place. For example: one man has set out a mile of willows, without the first rod being on the line. It only requires a few hours' work to plant permanent stones at all the corners of a section. This season of the year is the proper time to attend to this matter. If suitable stones cannot be had, cedar or burr-oak stakes may be used, and these should be inserted in the presence of three or four witnesses.—*Minnesota Record.*

FARM IMPLEMENTS.

The *Christian Union* (N.Y.), in a jocular vein, writes thus on this threadbare subject:—"We have resolved, for the present at least, to change our tactics regarding the care of farms Hitherto we have, in common with agricultural papers in general, urged farmers to take great care of their tools and machines. We have even printed directions for oiling, and painting, and storing, and the like. Now, however, we have abandoned that line of policy. The dealers in and manufacturers of such implements must live, and as we have some friends and acquaintances among them, we are convinced that we have been too forgetful of their interests. An editor says that during a ride of ninety miles which he took through an average agricultural district, he counted the following unhoused implements, namely: forty-four ploughs, twenty-three harrows, seven mowers, one reaper, with beater and platform as last used, waggons too numerous to count, and, in one instance, a set of harness hanging on a fence. The ploughs were mostly standing in the furrow where they had been last used. Such a sight as that gladdens the heart of the itinerant manufacturer, and is an example which ought to be followed by every tiller of the soil who wants a new set of implements. Farmers, attention! Do not rub linseed oil on your fork and shovel and rake handles; do not paint your ploughs and mowers; do not use any rust preventive on the iron and steel parts; and, above all, leave everything out of doors! You really have no idea how quickly you will possess a new set of tools, provided you can afford to buy them."

RAW onions halved, applied under the arms, in the hands, and to the bottom of the feet, will, it is said, speedily cure the small-pox.

Orchard and Forest.

HOW TO ARREST THE RAVAGES OF THE CANKER WORM.

Believing, as I do, that this subject is of vast importance to the country, and that you will agree with me in so believing. I take the liberty to address you this letter. The canker or measuring worm, which made its appearance in this part of the country but a few years since, has been spreading rapidly, and now may be seen in almost every township in the Northwest, some orchards at this time being entirely stripped of foliage by them, and unless an effort is made to exterminate them, in a few years more there will not be an orchard left "to tell the tale." The female canker worm rises out of the ground in the spring as soon as the frost is out, and crawls up the trunk of the tree (as she is wingless), and deposits her eggs under old bark or in rough places, which hatch in May into small looping caterpillers, or so-called measuring worms, which in a short time destroy the foliage.—Now, to keep her "ladyship" from crawling up the tree is the point to be gained. Leaden oil troughs used about the trunks of trees have been tried with some success, but the oil running over is apt to injure the tree. The plan, however, that has proved a perfect success, is by the use of coal tar. I saw a man at work last spring in the State of New York applying it to the trunk of the tree, forming a ring six to ten inches wide around it, which dose he informed me he repeated every day. and should continue to repeat as long as there was a necessity. That he was successful in keeping the worms down, was demonstrated by the fact that not one had got above the ring of coal tar, and that there were many thousands on the ground at the foot of the trees, lying motionless. He had discovered that unless he put on the coal tar every day, it would dry and the worms would crawl over dry-shod. Mr. Smith, an extensive orchardist of Des Moines, Iowa, has discovered an improvement on this plan, whereby two or three applications of the coal tar will answer for the season, which is as follows:—Raise a slight mound of earth around the trunk of the tree; wrap brown paper about eight or ten inches wide around the tree, making it fast to the tree with twine or wire close to the mound; turn the paper down so as to spread it over the mound, then apply coal tar to the paper. Moisture will gather from the mound under the paper, and thus prevent the tar from drying, and not a moth can get to the tree. After the worms have fairly commenced at the foliage of the tree comparatively little can be done to arrest their ravages. It has been claimed, however, that by throwing new slacked lime on the trees when the dew is on, very many will be destroyed; and a farmer living in Winnebago county, in this State, says he trained his hens to follow him into his orchard, and when he shook the trees and the worms came down on their silken threads, the hens feasted upon them, and that, while his large flock of hens grew fat, the worms were very materially checked in their operations.—No person owning an orchard in the vicinity of where these worms are working this season, should neglect the use of the coal tar next spring, and by one united effort this pest of the orchard (overshadowing in importance all other enemies of the orchard combined) can be exterminated.—*E. F. Curtis, in Chicago Inter-Ocean.*

DIGGING HOLES FOR TREES.

The practice of digging holes for the reception of trees far below the surface into the subsoil, and filling up the same with loam and vegetable refuse is rather to be avoided, for several reasons. Such holes, especially in heavy clay soils, are apt to become huge flower pots, without the usual facilities for drainage. The water in them becomes stagnant, and unfit for nourishing the tree. Again, as soon as the lower roots have extended beyond the "filling in," and into the side-walls, which they will do by the second or third year, the change in the soil is so sudden and marked as oftentimes to affect the roots very injuriously. The surface soil for such planting, when shallow, may be made a little deeper than it naturally exists, and the subsoil may be loosened to a considerable depth and breadth. It may be shovelled out and thrown in again, with a very little loam mixed with it. The walls of the opening should not be made with a clean, smooth cut, as in sinking a well. Let them be jagged and irregular, so that the roots, as they grow out into them, may not be subjected to any very sudden change in the soil.

[The soil would be better if prepared one or two years before planting by thorough, good, deep ploughing or digging and enriching.—AS.'T ED.]

WASH FOR TREES.

C. C. Cooley gives the *Country Gentleman* what he calls "the best wash for trees to be found in the world:"—Take *sal soda*, which can be had at retail at from three to six cents per pound; place it in a skillet on the fire. It will soon go to what seems to be water, evaporate, and leave a white powder. Keep it on the fire till it becomes a light brown, when it is done. Use a quarter of a pound, or, if the trees are much covered with moss or are very dirty, use half a pound to the gallon of water. Wash the trunk and large limbs, using a sponge or cloth. It can be used at any season of the year. I prefer in winter. This wash will not injure the foliage of the tenderest plant. In a few weeks after using the trees will look as clean and sleek as though they had been varnished, and the trees will astonish you by their growth and healthy appearance.

SALT IN NURSERIES.

Willard, of the well-known nursery firm at Geneva, New York, informs us that they have found very great advantage from the application of salt to their nursery grounds, as well as to farm crops. Twenty bushels to the acre is their usual quantity, and they use about 700 bushels per annum. Their facility of access to some of the salt-works in that State, gives them a chance for a full supply at low rates—about 25 cents per bushel—at which they consider it a cheap manure, It has also proved with them a very valuable application to pear trees, at the rate of about four handfuls to each tree, spread about. It seems to give a vigorous and healthy growth, and they are very rarely troubled with blight.

THE CONNECTION OF FOOD WITH VITALITY.

The past remarkable winter ought not to pass into mere history without our learning more from it than most of us have done. In other sciences, the rare incidents are eagerly looked forward to, as furnishing the best materials for the advancement of knowledge.—Thus eclipses and the various conjunctions of the stars never occur but humanity is the gainer; and even terrible eruptions of volcanoes or earthquakes, with all the evils that follow in their train, also serve to furnish man with new facts which make him more secure against these and other dangers. There is no better evidence that horticulture is not the science it should be, than its failure to profit by remarkable events as a true science should do.

However, if we have not the scientific students we might have, there are some facts in the past winter's experience so clear that we may not ignore them. We have in former articles shown how it was drought and not the absolute degree of frost which injured plants. That it was not frost was indeed plain, for every one knows that we have had much more severe frosts without anything near the same bad results following. But there are some cases which do not seem to accord with a drought theory. Two trees, for instance, stand together in the same soil; they are of the same age, and one would suppose drought should bear equally on them. But one is taken and the other left.

After all, it is not altogether a question of moisture in every case. Thirst kills animals, but hunger has also a fatal effect; and while there is no doubt that the immediate cause of death in trees last winter was a loss of moisture more rapidly than the roots were able to supply, yet it is clear that the ability to furnish moisture under these unfavorable circumstances in a great measure depended on the richness of the soil in which the plants are growing, or the vital condition of the plant, as regards its power to make use of its advantage.

There have been some interesting cases proving this point, in regard to mere moisture.—The writer saw in the spring a small hedge of the new Pyracantha. The demand for cuttings was pretty heavy last fall, and the most of the hedge was severely pruned, a small portion of the hedge only remaining untouched. This small portion, in common with many other wholly hardy things, was severely injured, but the trimmed portion did not lose a bud, but pushed out new shoots from every one. There cannot possibly be any other explanation here than that in the last case there were not near as many evaporating points through which to carry off the moisture.

In regard to vitality also, there was met with a very interesting incident. Early in the season of 1872, it was decided to transplant every other one of some twenty inch Norway Spruces; but through pressure of other work this could not be done until the middle of June. These transplanted plants grew well and apparently remained in perfect health; as much so as the untransplanted ones alongside of them. But in spring all of these were terribly injured, the others not in the least. The plants were in every respect the same, except the shock to vitality, which always takes place at transplanting

In regard to the matter of food. There is scarcely an instance in this vicinity where American arbor vitaes, hemlocks, Norway spruces, or firs of any kind, stand where the concentrated wind could whistle round a north-east corner, that the plants were not utterly destroyed. But we have seen several instances where arbor vitaes have been used as screens for dung yards, and other places where the soil was extra rich, and these in the direct way of the keenest of cold currents, without any injury whatever; and always it has been the trees in the poorest soils, which, all other things being equal, have suffered the most.

We will not here multiply instances, but give at once the conclusions arrived at after a very careful study of many apparently contradictory facts furnished by the past winter:—Trees are killed by evaporation in winter time in precisely the same way as they dry out in summer. Trees or parts of trees lose their moisture in the winter time in proportion as their vitality may have been injured by previous circumstances. Trees which have the best opportunities to get all the food they require, are hardier than those which have but a limited supply.—*Gardeners' Monthly.*

THE CODLING MOTH.

Mr. Oliver Chaplin's mode of destroying this insect (according to a statement in a recent number of the 'Country Gentleman') is to thresh the branches bearing the infested fruit. This, doubtless, is a good suggestion, and may prove of great value, but our experience in regard to "striking the limbs with a pole" is that the bearing twigs are more or less bruised and injured by this operation, and, besides, the sound fruit is unavoidably knocked off with the wormy.

Our plan would be to provide a light pole with a fork or crotch at the small end, made by sawing off the prongs to the length of four or five inches. This crotch should be padded with old hatleather, or something of the sort, tacked on, and in using the instrument place the forked end among the branches, and tap the lower end with a hammer or wooden mallet.

It is believed this mode would not injure the bark of the limbs and the sudden jar would be much more general and effective than if struck with a pole, which must be injurious to the bearing wood of the trees. In regard to the fruit containing the worm, it will all or nearly all fall off naturally with the early broods of the insect, and if promptly removed, by hogs or by hand, the same result will follow. The advantage of Mr. Chaplin's plan is that the thing is done at once and with much less trouble, and may be repeated if necessary without much cost.—*Cor. Country Gentleman.*

DISTANCES FOR FRUIT TREES.

This subject was discussed lately by the Ontario Fruit Growers' Association, and the conclusion come to was this, that the most suitable distance for apple orchards was thirty feet each way; but in case of using kinds which did not have spreading heads, such as the Early Harvest, Duchess of Oldenburgh, Northern Spy, &c., these might just as well be planted more closely, say twenty feet each way.

Close planting should be the rule in more northern localities; and those who had practiced it together with low training had been uniformly successful

One grower advocated the quincunx form, or planting the trees thirty-three or forty feet each way, and then planting one in the centre of each square formed by every four trees.

At the same time the uniform testimony seemed to be in favor of six feet as the proper height of training branches of fruit trees from the ground. If the branches come any lower than this they impede cultivation, and the weight of fruit and leaves bend them over to the ground, affording considerable inconvenience.

WASH FOR FRUIT TREES.

C. C. Cooley, of Adams Co., Ohio, in the *Country Gentleman*, recommends *sal soda* in water as the best wash for trees. The soda is to be placed in a skillet on the fire, where it will dissolve, evaporate and leave a white powder, which will become light brown as the heat is continued. From one-fourth to one-half lb. of this to one gallon of water is to be used.—The trunk and large limbs of the trees are to be washed with this, using a sponge or cloth, at any time in the year. He claims that in a few weeks the trees will look as clean and as sleek as if varnished, and that they will grow rapidly.

APPLE TREE BARK LOUSE.

A correspondent of the *Country Gentleman* claims to have expelled the bark louse from an apple orchard by putting small pieces of whale oil soap in the forks of the limbs so that the rain would carry the strength of the soap over the limbs. Two years' application was entirely effectual.