Rural Economy.

RENOVATE OLD ORCHARDS RATHER THAN PLANT NEW ONES.

This is often the best plan. We have a case in our own orchard. There were eight old trees planted forty years ago. The trees were neglected, and began to decay. It was proposed to remove them and plant anew, especially as some of the holes were rotten and showed but few signs of life; one trunk in particular was more than half decayed. We finally concluded to give the trees the benefit of a thorough renovating. The dead limbs, and the partially dead, were all removed; the healthy were slightly thinned out; but no vigorous branches of good size were removed; some of these were taken down, where it was deemed necessary, the second year following, giving the trees time to recover from the shock.

There was a remarkable growth the first year, as the soil was deep and rich, an alluvial deposit. The second year the thinning was continued. Vigorous shoots were encouraged, at the expense often of other thrifty limbs, a new *set* of branches being thought preferable to the old forms. This proved to be good policy. The new shoots grew, and carried with them a new impetus which was unusual to the tree. The fruit, most of all, was improved, not only in quality, but in quantity. In a few years there was more spread at the top than ever before. This kept on; and at the end of eight years, there are eight trees which for beauty and for benefit are unsurpassed. They are mostly Spitzenbergs (Esopus); two are Fall Pippins. All do equally well; but the Spitzenberg is the most graceful, bending its branches down to the ground, though originally they were high enough, kept so by the hand of the pruner before they came into our possession. The largest tree (a Spitzenberg) measures forty feet across the top, and is as fine a specimen of a tree as one can wish to see. These trees are an ornament, a delight—but most a profit, affording yearly more fruit than is needed by a family of three, reaching seventy bushels—that last year—and never less than thirty. And this it must be considered is of scant bearing kinds, the Spitzenberg being subject to many mishaps. But the finest fruit we have ever seen, (which the Esopus Spitzenberg is when in perfection,) even in the West, where we have seen the best chances of yield, as, for instance, last summer, which was a moist season there—of all fruit we have ever seen, we do not know anything that equals the Spitzenbergs that grow upon these trees, both for size and flavor, and especially for beauty of form and coloring. We keep them till May in good condition. "Windfalls" we have kept longer. But we take care of our trees. When any of the branches are struck with decay, we remove them, and the gap will be closed in a year or two, benefiting at the same time the rest of the tree. But the tree with the rotten trunk it is worth while to report. This had not a sound limb, if we except a small branch which shot up in the centre. Instead of cutting down the tree, I removed all the branches but the green shoot in the centre. This rushed up, and in a few years bore fruit, and spread itself, as the Spitzenberg will, and now touches the ground. Each year it bears the largest, handsomest fruit; but there is occasionally rot at the core, as if it took after the trunk. This, however, may be in consequence of its location—at the side of a building—and the fact that it gets the wash from the kitchen to a certain extent, causing a moisture which is in constant evaporation. But this is mere guesswork. The tree has one of the handsomest tops in the orchard, though not so large as the other trees, measuring but twenty feet in width.

This orchard has borne fruit without interruption, increasing even the first year the quantity over the former years. It has never done better than it gives promise for this year. The only drawback is the curculio, which yearly stings the fruit, and hurts it to some extent—now and then considerably. But there is always, even in the worst seasons, when drought and insects combine, some sound fruit, generally a good proportion. The rapid growth and healthy condition of the trees overcome, to a great extent, the injury. I find it also in the West.

The roots of these trees have a deep seat, and are not dependent upon influences on the surface. Manure, therefore, has but little effect, and it is not needed. The natural soil seems best, healthiest for fruit. It is well drained naturally. The orchard has been in grass mostly since its change. Surface influences, of whatever kind, seem to have no effect upon the trees. The orchard bids fair, apparently, to do good service another forty years. We see no reason why other trees, similarly situated with respect to soil, should not do equally well, treated as these are. Where the soil is less rich, and of less depth, manure should be added; and cultivation would be of some benefit, though in old trunks much less than in young trees. We are also pursuaded that trees should be protected by branching downward, where this can be done, as in the case of the Spitzenberg. We have seen enough of high tops, and of the benefit and beauty of low sweeping branches. Ploughing is no excuse among old trees; and in young trees it should be kept at a distance.—*Cor. Rural New Yorker.*

FARM LABOR AND LABORERS.

Much time is sometimes lost, and expense unnecessarily incurred by farmers, in consequence of a lack of communicativeness toward their employees. It is by no means a bad plan for a farmer to impart to his hired help, at the close of each day's business, his plans and purposes with respect to each laborer during the succeeding one. It may be said that this does not concern the laborer; that he is paid for his time, whether advantageously employed or not, and that is all he need know or care about the matter. Strictly speaking, this may be true, but the policy of such reticence is at least questionable. A farmer rarely if ever loses anything by imparting to his help beforehand, his purposes in reference to immediate future operations. They are enabled frequently, from their experience in farming operations, to make valuable suggestions as to the particular business in hand. Besides, being pre-advised of what is expected of them, they will think about it, and hence be better prepared to act than they otherwise would be. This confidence detracts nothing from the authority of the employer, while it imparts spirit and energy to the employed.

WHAT IS VANILLA?

"Lemon or Vanilla?" is the question usually asked when one orders an ice cream, showing the great popularity of these two flavors. Of the many who are fond of this peculiar, and, to most persons, delicious aromatic, probably but few know anything more about it than that it is a sort of bean, as the article is known in common under the name of "Vanilla bean." Vanilla is one of the few economical products of that remarkable family of plants known as Orchids, or *Orchidaceæ*, so prized by the florist for the beauty of their flowers, and so interesting to the botanist for the wonderful modifications of structure the flowers present. We have a number, such as the Lady's Slippers, Orchises, etc., which are all terrestrial, or grow in the soil; but in the tropics, where they abound, most species grow upon the branches of trees, and draw all their sustenance from the air; hence when these plants are cultivated in our hot-houses, they are popularly known as "air plants." The Vanilla differs from most other orchids in being a climbing vine, clothing the trunks of trees. It throws out great numbers of ærial roots, by which it clings, and produces very thick, shining leaves. The flowers of the Vanilla are not as showy as those of most of the family, and are produced in clusters that are succeeded by bunches of long slender pods, which are the "beans" of commerce. The pods are six or eight inches long, narrow, three-sided, and if allowed to remain on the plant, finally burst into three valves or parts, and scatter the minute black seeds. The pods are gathered when fully developed, dried in the sun, and afterward rolled up in parcels, where they undergo a sort of fermentation, or sweating process, to develop the odor. It is said that the fruit allowed to dry without this treatment possesses very little aroma. The pods are afterward oiled, done up in bundles, and sent to market. The best will be found to be frosted with minute crystals, which are the aromatic principle. The name of the plant is *Vanilla aromatica;* Vanilla is a Spanish word, meaning a little pod. The Tonqua Bean, the Sweet-scented Vernal-grass, Seneca-grass, Melilot, and some other plants, have an odor resembling that of Vanilla, and contain the same or a very closely related aromatic principle. Indeed, the Tonqua bean is often substituted for Vanilla in flavoring, and the "Extracts of Vanilla" are frequently wholly, or in part, made of it. The Tonqua bean is much less expensive than Vanilla, but the substitution can only deceive those who are not familiar with the flavor of the two. Not only is Vanilla largely used to flavor ice cream, but for custards, russes, cakes, and many other delicacies. Probably a reliable extract is the handiest form in which to use it. The best way to use the bean itself is to beat it in a mortar, with sufficient loaf sugar to finely divide and powder it, and to absorb all the oil. This is to be kept closely stopped.—*Agriculturist.*

BLOT ON COFFEE.

Professor Blot, in one of his recent lectures at Boston, treated of making coffee. He said the best mixture of coffee would be in these proportions: one pound of Java, two ounces of Mocha, two ounces of Rio and two of Martinique. Roasted coffee must be kept in a tin box and ground freshly every day. It is extremely difficult to find good coffee, and it really seems as if merchants conspired to make it as bad as possible. Mons. Blot gave a few of the secrets of the trade, such as watering the coffee while roasting, that it may not lose weight, as it diminishes about sixteen per cent. during this operation. Useful hints in regard to selecting and roasting were given. Coffee must never boil; by so doing it does not gain in strength, but loses the delicate aroma. The professor used four tablespoonsful of Java and of Mocha to a quart of water. The water was boiled, and the coffee was moistened with the boiling water; at the second boiling of the water it was again poured upon the coffee; it was allowed to settle a few moments, and it was done. The result was a liquid as clear as spring water. Rye coffee must seldom be employed. When coffee cannot be obtained, a very good substitute can be found in wheat; pound and roast and prepare like coffee.

A HINT TO LOVERS OF FLOWERS.

A most beautiful and easily attained show of evergreens may be had by a very simple plan, which has been found to answer remarkably well on a small scale. If geranium branches, taken from luxuriant and healthy trees, just before the winter sets in, be cut as for slips, and immersed in soap water, they will, after drooping for a few days, shed their leaves, put forth fresh ones, and continue in the finest vigor all winter. By placing a number of bottles thus filled in a flower basket, with moss to conceal the bottles, a show of evergreen is easily secured for the winter. All the different varieties of the plant being used, the various shapes and color of the leaves blend into beatiful effect. They require no fresh water. So says a lady who has tried it and handed us the above slip for publication.—*Germantown Telegraph.*

UNPRODUCTIVE FRUIT TREES.—Sometimes fruit trees are unproductive from other causes than proverty of soil, or neglect of the orchardist. They often grow too luxuriantly to bear well. In this case root pruning is very effectual, and is performed by digging a circle round the tree. A fifteen year old tree, for instance, may be encircled at five feet from the trunk. No rules can be laid down for this; judgment must be exercised. If cut too close, the tree may be stunted for years, and if too far, it will not be effective. The aim should be to reduce the root about one-third.—*Gardeners' Monthly.*

Scientific.

ORIGIN OF THE GLACIERS AND THEIR RESULTS

IN THE VALLEY OF THE AMAZON.

It is my belief that all these deposits belong to the ice period in its earlier or later phases, and to this cosmic winter, which, judging from all the phenomena connected with it, may have lasted for thousands of centuries, we must look for the key to the geological history of the Amazonian Valley. I am aware that this suggestion will appear extravagant. But is it, after all, so improbable that, when Central Europe was covered with ice thousands of feet thick; when the glaciers of Great Britain ploughed into the sea, and when those of the Swiss mountains had ten times their present altitude; when every lake in Northern Italy was filled with ice, and these frozen masses extended even into Northern Africa; when a sheet of ice, reaching nearly to the summit of Mount Washington in the White Mountains (that is, having a thickness of nearly six thousand feet), moved over the continent of North America—is it so improbable that, in this epoch of universal cold, the Valley of the Amazons also had its glacier poured down into it from the accumulations of snow in the Cordilleras, and swollen literally by the tributary glaciers descending from the table-lands of Guiana and Brazil? The movement of this immense glacier would be eastward, and determined as well by the vast reservoirs of snow in the Andes as by the direction of the valley itself. It must have ploughed the valley bottom over and over again, grinding all the materials beneath it into a fine powder or reducing them to small pebbles, and it must have accumulated at its lower end a moraine of proportions as gigantic as its own; thus building a colossal sea-wall across the mouth of the valley. I shall be asked at once whether I have found here also the glacial inscriptions—the furrows, striæ, and polished surfaces so characteristic of the ground over which the glaciers have traveled. I answer, not a trace of them; for the simple reason that there is not a natural rock surface to be found throughout the whole Amazonian Valley. The rocks themselves are of so friable a nature, and the decomposition caused by the warm torrential rains and by exposure to the burning sun of the tropics so great and unceasing, that it is hopeless to look for marks which in colder climates and on harder substances are preserved through ages unchanged. With the exception of the rounded surfaces so well known in Switzerland as the *roches moutonnees* heretofore alluded to, which may be seen in many localities, and the boulders of Errere, the direct traces of glaciers as seen in other countries are wanting here. I am, indeed, quite willing to admit that, from the nature of the circumstances, I have not here the positive evidence which has guided me in my previous glacial investigations. My conviction in this instance is founded, first, on the materials in the Amazonian Valley, which correspond exactly in their character to materials accumulated in glacier bottoms; secondly, on the resemblance of the upper or third Amazonian formation to the Rio drift, of the glacial origin of which there cannot, in my opinion, be any doubt; thirdly, on the fact that this fresh-water basin must have been closed against the sea by some powerful barrier, the removal of which would naturally give an outlet to the waters, and cause the extraordinary denudations, the evidences of which meet us everywhere throughout the valley.

On a smaller scale, phenomena of this kind have long been familiar to us. In the present lakes of Northern Italy, in those of Switzerland, Norway, and Sweden, as well as in those of New England, especially in the State of Maine, the waters are held back in their basins by moraines. In the ice period these depressions were filled with glaciers, which, in the course of time, accumulated at their lower end a wall of loose materials. These walls still remain, and serve as dams to prevent the escape of the waters. But for their moraines, all these lakes would be open valleys. In the Roads of Glen Roy, in Scotland, we have an instance of a fresh-water lake, which has now wholly disappeared, formed in the same manner, and reduced successively to lower and lower levels by the breaking down or wearing away of the moraines which originally prevented its waters from flowing out. Assuming, then, that, under the low temperature of the ice period, the climatic conditions necessary for the formation of land-ice existed in the Valley of the Amazons, and that it was actually filled with an immense glacier, it follows that, when these fields of ice yielded to a gradual change of climate, and slowly melted away, the whole basin, then closed against the sea by a huge wall of *debris*, was transformed into a vast fresh-water lake. . . . However this may be, it follows from my premises that, in the end, these waters obtained a sudden release, and poured seaward with a violence which cut and denuded the deposits already formed, wearing them down to a much lower level, and leaving only a few remnants standing out in their original thickness, where the strata were solid enough to resist the action of the currents.—*Agassiz in Atlantic Monthly.*

THE NEEDLE-GUN.

Nothing can more thoroughly demonstrate how far Austria must be and is behind the times in her muskets than the astonishing results attributed to the Prussian needle-guns. Many have supposed them some new invention. But the fact is, that the precise arm has been well known for more than ten years, and a similar one was on exhibition in a gunmaker's shop in this city in 1851 or 1852. So far as the needle principle is concerned, it may be doubted yet whether the objection which caused it to be rejected altogether by the English army is not valid; *i. e.*, that it—the needle and the machinery that operates it—are too delicate and liable to get out of order. Since the battle of the 3d of July, an army officer writes that in cocking this weapon, it is particularly liable to send the needle into the charge prematurely, and before the musket can be brought to the shoulder. One of the many advantages claimed for the gun is, that it fires that part of the powder first which is nearest the ball, and thus secures the explosion of the whole charge in the piece, and so gives a longer range. It is, however, the rapidity of these as breech-loading muskets, and as losing no time in placing the cap, that have given the Prussians their great advantage in the present war.

The greatest advantage of breech-loading rifles is in the rapidity of fire, and this is so great that the same man who rezently found he could load and fire his muzzle-loading Springfield ten times in four minutes and forty-six seconds, fired his ten rounds with the breech-loading or Snyder Enfield in one minute and forty-seconds, or less than one-third of the time! Yet for years have the military men of the old world been fighting against breech-loaders. Now, suddenly, since the battle of the 3d of July, orders have been given to convert 100,000 of the Enfield rifles into Snyder Enfields.

It is chiefly against charges of cavalry that breech-loading rifles are so extremely formidable. The infantry formed in squares to receive a charge, and beginning to drop their antagonists at 1000 yards, could clear almost every saddle before a man could come near enough to fire off his carbine, much less use his sabre to any advantage. Each foot soldier would have his antagonist under fire long enough to shoot at him ten or fifteen times, according as he took aim. Let any one think of the charge of the Light Brigade at Balaklava, and ask how many of them would have returned from charging in that style upon a regiment armed with breech-loading rifles.

All through our war the English officers who viewed our battles spoke with great contempt of the way in which our cavalry behaved in not making furious and decisive charges. But such charges against a cool and well-armed adversary now and henceforth must ever be decisive, but only of defeat. We knew the men and arms we had to face. Such a charge as that at Balaklava will never again be made, even by officers having no more sense than those who gave the fatal order which consigned to the grave uselessly so many brave men.

Thus far, the war in Europe has developed nothing but what has been well known in our army for years, and been acted upon as far as possible all through our late war. The escape of gas has now been so perfectly prevented, as to leave nothing further to be desired in this respect. The thin brass or copper cylinder in which the cartridge is contained, overlaps the crevice of the joint, and, expanding, makes the whole perfectly air-tight. It seems that if it were found greatly desirable to explode the front portion of the charge first, it would not be difficult to effect even this by simpler and better means than the needle of the Prussians.

ORGANS OF PERCEPTION IN THE LOWER ANIMALS.

The long whiskers of the felidæ are delicate organs of the sense of feeling; but those of the shrews even surpass them in sensitiveness of touch, and seem to make amends to these active little creatures for the smallness of their eyes, which are almost hidden in the surrounding hairs, and formed but for twilight vision. Thus armed, they feel at a distance of eight or nine inches the slighest motion of the air, and the mere bending of a finger held out to them unseen suffices to alarm them. The utmost delicacy of touch, so as almost to reach the limits of credibility, is, however, possessed by the bats, who need no collision with any object to advertised of its vicinity, but in the midst of darkness avoid any object that presents itself, with the same unerring certainty as in the light.

Spallanzani, having observed this wonderful power, instituted a series of experiments, the results of which proved that bats, when deprived of sight by the extirpation of the eyes, and as far as possible of hearing and smell, by the obliteration of the external passages of these senses, were still capable of directing their flight with the same security and accuracy as before, steering their course through passages only just large enough to admit them without coming in contact with the sides, and even avoiding numerous small threads which were stretched across the room in various directions—the wings never, even by accident, touching any of them. These marvelous results led him to believe that these animals are endowed with a sixth sense, the immediate opperation as well as the locality of which is, of course, unknown to and inappreciable by us; but the sagacity of Cuvier removed the mystery without weakening the interest of these curious facts, by referring to the flying membrane as the seat of this extraordinary faculty. According to his view of the subject, the whole surface of the winds on both sides may be considered as an enormously expanded organ of touch, of the most exquisite sensibility; and it is, therefore, by the varied modifications of the impulsion of the atmosphere upon this surface that the knowledge of the propinquity of foreign bodies is communicated.

But touch is not the only sense which is highly developed in the bats, for the vast extent of the shell of the ear in the insectivorous species is undoubtedly of great assistance in the collection of sounds, and their smell is also wonderfully acute. In many of them, particularly in the rhinolophidæ—whose habits are more completely lucifugous and retired than any others, and who are found in the darkest penetralia of caverns and other places where there is not even the imperfect light which the other genera of bats enjoy, the nose is furnished with folaceous appendages, formed of the integument doubled, folded, and cut into the most curious and grotesque forms—an organization evidently intended to give increased power and delicacy to the organ of smell, and thus to supersede the sense of vision in situations where the latter would be unavailable. Thus admirably equipped for nocturnal flight, the bats launch forth in quest of their insect prey, which, though screened by the veil of darkness, vainly endeavors to escape detection.—*Dr. O. Hartwig.*