which surround it. These satellites are arranged in a conformity to produce this effect. The various phases which the rings present are explained by the varying conditions to which they are subjected by the varying attraction of the satellites; thus we have the rings sometimes appearing single, sometimes double, and sometimes divided into numerous divisions. Also, on this supposition it appears, that rings could not belong to a planet, unless it has the requisite number of accompanying satellites. It is possible, said Prof. Pierce, that the sun, with its planet-satellites, may have once had a ring, in which case its position would fall in that place in which it could be best supported, and that would be in that space now occupied by the asteroids.

Improvement in Chronometers.

Among the various difficulties which have stood in the way of chronometrical improvement, perhaps no defect has occupied so much time as the imperfect compensation for change of temperature, which has claimed the attention of some of the first mathematicians of the day, as well as those practically engaged in chronometer-making. The defect we allude to is this,—that if chronometers are adjusted for extremes of heat and cold, they will gain in the intermediate temperatures. This is caused by the balance-spring losing elasticity by an increase of temperature at an accumulating rate over the effect produced by the ordinary compensation.

Mr. Loseby has introduced mercury to overcome this defect, which, by its fluidity, admits of being adjusted, so that its effect may vary exactly in the same proportion as the change of temperature alters the elasticity of the spring; or, in other words, which makes the law of the successive alterations of the momentum of inertia adapt itself to the law of alteration of the elasticity of the spring, whatever that law may be. Since the invention was submitted to the Government in 1843, it has undergone several trials, by order of the Board of Admiralty, with a view to test its principle. The chief points which required to be proved were, first, whether the principle admitted of being adjusted to the irregular loss of elasticity in the spring; and, secondly, if the effect produced by the mercury would be sufficient. The fluidity of the agent used at once answered the first point; and it was therefore to the second that the trials have been chiefly directed. The result shows that not only can the ordinary defect be obviated, but in most of the trials it has even been reversed, so that all doubt has been removed on the remaining point.

Sweet Oil of Turpentine.

A most important chemical discovery, says an English paper, has been recently made, by means of which oil of turpentine can be freed from its peculiar smell so completely that not only is it inodorous, but can be impregnated with any desired perfume, without at all deteriorating from its useful properties. The eminent chemist, Dr. Serney, who has analysed the sweet oil of turpentine, states that while all the useful properties of oil of turpentine are preserved, in fact all its deleterious qualities are completely obliterated. The doctor also states that paint when mixed with sweet oil of turpentine, is free from smell, and does not emit those vapours which are prejudicial to health, and that the use of sweet oil of turpentine is a certain preventive of painter's cholic, and by its use house painting becomes a perfectly inodorous process.

CARBONIC GAS.—The volume or bulk of carbonic acid gas expired by a healthy adult in twenty-four hours is said to amount to 15,000 cubic inches, containing about six ounces of solid carbon. This is at the rate of 137 pounds avordupois per annum; and taking the total population of the globe at seven hundred and sixty million, the amount of solid carbon or charcoal, every year produced by the human race, exceeds 46,483,143 tons! Adding to this all the carbon produced by the combustion of fires and gas lights, by the decay of animal and vegetable matter, the exhalations from springs, etc., there need be no marvel as to the source whence plants derive their solid or woody material, (which is principally carbon,) seeing that their leaves are especially fitted for the absorption of carbonic and acid gas from the surrounding atmosphere.

Boy's Marbles.

There is something strange in the manufacture of these toys. The greater part of them are made of a hard stone found near Coburg, in Saxony. The stone is first broken with a hammer into small cubical fragments, and about 100 to 150 of these are ground at one time in a mill, somewhat like a flour mill. The lower stone, and which remains at rest, has several concentric grooves or furrows; the upper stone is of the same diameter as the lower, and is made to revolve by water or other power. Minute streams of water are directed into the furrows of the lower stone. The pressure of the runner on the litile pieces rolls them over in all directions, and in about a quarter of an hour the whole of the rough fragments are reduced into nearly accurate spheres.

TO EXTRACT GREASE, PAINT, &c.—Among the numerous useful properties of Chloroform, there is one that is not generally known—and that is its power in extracting grease, paint, &c., from the most delicate fabric without the slightest injury to color or texture. A rose-colored silk, (of all tints the easiest injured, covered with paint,) can be completely cleansed by it, though the paint has been dried upon it for months. To use it to the best advantage, fold a piece of white flannel into a small packet and lay it under the article to be cleansed, wet another piece similarly folded, with chloroform, (a few drops are sufficient,) and wipe gently the fabric with it until the grease is completely removed. To cleanse an old dry paint stain, it is best to press the spot before rubbing, so as to soften the hard surface of the paint.

NEW WATER-CEMENT.—It is said a very strong and valuable water-cement has been made by Gen. Pasley of the British army, consisting merely of four parts by weight of chalk and five of blue clay. According to the experiments made to prove its strength, it must possess extraordinary tenacity.

TO KEEP PRESERVES, apply the white of an egg with a suitable brush to a single thickness of white tissue paper, with which cover over the jars, overlapping the edges an inch or two. No tying is required. The whole will become, when dry, as tight as a drum.

The Farm.

Effects of Coal Tar on Fruit Trees.

In the fall of 1848 I was desirous of obtaining a preventive against the ravages of the field mice, some of my fruit trees in a previous season having been destroyed by them.—I found in Downing's "Fruit and Fruit Trees of America" the following, to prevent mice or rabbits from girdling trees. "The most effectual remedy is the coal tar made at the city gas works. Before winter commences, a coat of is this with a common painter's brush, laid on the lower part of the trunk, from the ground to the height of two feet. Experience has proved that it does no injury whatever to the tree, while it completely prevents, for that season, the attacks of mice, rabbits and bark devourers of every kind."

He mentions also soot and milk as a preventive; this I tried first, but finding it difficult to make a satisfactory composition of such ingredients, I obtained some coal tar from the "city gas works." This I applied to thirty or forty trees, principally strong, healthy Baldwins, some six or eight years old. In the following spring I examined the trees, and certainly they were uninjured by the mice. I next endeavored to remove the tar, but here was the rub, and a hard rub it proved, for the strongest whale oil soap solution I could apply had not the slightest effect in removing the tar. I then endeavoured to scrape it off, but I found, to get the tar off in this way, I should be obliged to take bark and all. This not being exactly what was desirable, I suffered the trees to remain with their unsightly black coats. Since that period the greater number of them are dead or dying, and I can account for the fact in no way, except from the influence of the coal tar, not only from its binding the bark of the tree, but from its excluding from the parts covered by it, air, light and moisture. These effects I am certain that it has.—*Correspondence N. E. Farmer.*

FOUR YEARS IN MOWING.

This we believe is the best way to manage tillage land, from our experience of twelve years. We manure and plant the first year with corn or potatoes; second, sow down with wheat, barley, or oats, and grass seed; keep in grass four years, and then break up again. We think this a far more profitable course than the old system of farming practiced by many of our farmers, that of keeping land in grass from ten to twenty years, as in that time the land becomes as solid and hard as a highway, and the sod as tough as leather, so that it takes three years at least to rot it and lay it again to grass. I managed a farm in this way eight years, and it increased the crop of hay from six tons to twenty, while in two years of the time the hay was about all sold off, and I purchased no manure. It is contended by some, that the rotting of a good sod is equal to twenty loads of manure to the acre, and I do not doubt it. This system makes a quick rotation of crops, keeps the soil light and mellow, and thus the crops do not suffer by drought. And I have a great advantage over the old system, for I rot two or three sods where others rot but one, as also a good crop of grass. This system is practised by many of our farmers, as the other, after the first six years, will hardly pay for cutting the grass at labourers' prices, $1,25 per day. We turn up the sod even if it bears good grass, when its turn comes, and do not wait for it to get worn out. It does not then require so much ox labour to plough, and is much more easily cultivated afterwards. We have, therefore, this advantage, we work a field three times while the old system does it but once. I am now trying the plan on another old worn-out farm, and if I should live, I may report my experience hereafter. In the mean time we would advise our brother farmers to try it themselves; it will require sacrifice the first rotation, but no man will be dissatisfied with it after trying it two rotations. Now we would not advise anything wild or visionary; every farmer has already the means without extra expense; all that is required is his team and his plough to begin with.—*Cultivator.*

Ploughing Under Grass.

If greensward be ploughed the latter part of May, or early in June, after the grass has got a good start, and the sod completely inverted, it will decay very rapidly, from the fermentation of the green crop, and very soon become available food to the growing plants. When grass lands are ploughed late in the season, with a good crop of green matter to turn under, the sod will decay sooner than if ploughed in fall, or early in spring.

One not experienced in this mode of cultivation, will be astonished at the rapidity of decomposition in the sod. We ploughed a rather tough grass sod the 20th of June; then spread manure; harrowed thoroughly, and planted potatoes. In only a few weeks they were ready for hoeing, and at this operation, the sod was already decaying and becoming mellow. At harvesting, it seemed completely decomposed. From the large crop, with only light manuring, it was evident that the sod and grass contributed principally to the production of a large crop.

Sward land, with a good crop of grass, ploughed late, is in good condition for corn or potatoos, or almost any other crop, with suitable manuring. By repeated harrowing, so as to produce fine tilth, it is suitable for squashes, cucumbers, melons, pumpkins and cabbages, and they will generally succeed better on rich lands than old ground, which often abounds in insects. It is also good for buckwheat, and for ruta bagas and other turnips; and if the land is a deep loam, and ploughed deep, and well pulverized, it will answer well for beets and carrots. It is also good for fodder corn.—*N. E. Farmer.*

Food for Plants.

A specimen of a soil of good appearance was given to Sir Humphrey Davy, from Lincolnshire, in England, as remarkable for sterility. On analyzing it he found sulphate of iron. He recommended a top-dressing of lime, and the sulphate of iron was forthwith converted into the sulphate of lime; a noxious substance was at once changed into an object of fertility. It was the boast of Franklin that he had stripped lightning of its perils and chained the thunderbolt. Chemistry does more.—Poisons are changed by its alchemy into the means of subsistence.

The Hon. Reverdy, Johnson purchased in 1849, a small farm near Baltimore, in the last stage of impoverishment. Such was its reduced condition that the last crop of corn was not more than one peck to the acre. He states that all the vegetable matter growing on the two hundred acres of cleared land, including briers, sassafras and other bushes, if carefully collected, would have been insufficient for the manufacture of one four-horse wagon-load of manure. He applied to Dr. David Stewart of Baltimore, an able chemist, who rode out to the farm and procured specimens of the soil, which he carefully analyzed. He found that it contained an abundance of lime, potash, magnesia, iron and organic matter, duly mixed with alumina and sand. One element only of a fertile soil was wanting, phosphoric acid; and of this there was no trace. He recommended an application to the soil, of the biphosphate of lime, a preparation of bones, as the best mode of supplying the deficient element. The remedy was given at the expense of ten dollars per acre. It was the one thing needful. Health was restored to the exhausted patient, and the grateful soil yielded last year twenty-nine bushels of wheat per acre to the proprietor. Nothing else was wanting.—Here was a beautiful triumph of science.—There was no doubt about the facts; the experiment came under our observation. It was detailed to the writer by Mr. Johnson himself.

Maple Sugar.

We were not aware, till informed by the Boston Olive Branch, that the quantity of maple sugar made and used in this country was so large. That journal remarks that though "the quantity manufactured this year, is said to be less than the last year, it is nevertheless very large. Few are aware of the immense quantities of this article made in the Northern tier of States. It appears to be more than twice as much as that manufactured from the cane in all the sugar-growing portions of the United States. More than one-half of the twenty-three millions of inhabitants in the United States are supplied with nearly all the sugar and molasses they use, from the rock or sugar maple. The price this kind of sugar bears in our market, always averages considerably above that imported from Havana, and much above that coming from New-Orleans or Brazil. Yet this immense amount of saccharine matter is all manufactured in three or four weeks, by farmers, at a time when they could do very little else to profit.

Pass it Round.

Every "merciful man," who works a horse during the hot months, can promote its comfort by the use of the following simple shield against the teasing of flies: Take two or three handfuls of walnut leaves, upon which pour two or three quarts of cold water; let it infuse one night, and pour the whole next morning into a kettle, and boil for a quarter of an hour; when cold it is fit for use. Moisten a sponge with it, and before the horse goes out of the stable, let those parts which are most irritable be smeared over with the liquor.

Hilling.

The practice of hilling plants is fast going out of fashion. Nearly all of our best farmers till their corn on a level; and many have discontinued the practice of hilling potatoes. Let any one who hills his potatoes, examine them after a powerful rain has succeeded a drought, and he will find that while land on a level is well saturated with water, his potatoe hills are dry. If there is any advantage in hilling any plants, it is on wet land, as the hills throw off the water, which settles down in the hollows made by digging up the earth to make hills. This leaves the hill comparatively dry; of course hilling on dry land, or land of medial texture, is injurious.—*New England Farmer.*

Bugs on Vines.

Bugs on squash and pumpkin vines are caught by placing shingles, or bits of board, near the plants. Early in the morning, you will find the large black and the small striped bugs under these boards, where they gather at night and are protected. Take up one board in each hand, bring the two in contact, where the bugs may be crushed by rubbing them together.

Sprinkling the vines repeatedly with ashes, plaster, and such matters, drives the bugs away. Charcoal dust, lime, ashes, and all such remedies, have a good tendency to keep off the intruders.

Method of Supporting Trees.

The branches of trees, when loaded with fruit, may be kept from breaking in the following manner: Connect with cords all the heaviest branches, commencing with the lower ones, and fasten the ends to the upper part of the trunk. Branches when thus secured together cannot break. This plan is far superior to the old method of props.