Scientific.

Experiments in Blacksmithing.

Sawing heated iron or steel, is not known or thought of by blacksmiths; and when forks or branches are to be formed from one stock, even if the branches are to remain, eventually, nearly in contact and parallel to each other, the usual method is to split the end of the iron with an awkward cold chisel: thereby deforming the edge of each branch; on which account the branches must be bent asunder for the purpose of hammering, shaping, and squaring the end of each, after which they are brought together as well as may be, usually retaining a roughness in form, if not a deficiency in size and strength, near the juncture of the branches. Instead of this tedious process, the iron when heated may be put into a vice, and the ends may be readily split with a suitable saw, which would save much labour and hammering and filing. A saw fit for this purpose should be thicker at the edge than at the back, and with uniform teeth, about one-twelfth of an inch apart. The saw when used must often be dipped in water, to prevent its becoming too much heated. There is also a method of sawing or cutting hardened steel which is not so generally known as should be. A circular piece of common iron plate or sheet iron, being adjusted to a lathe, or by other means put in violent rotary motion, will readily cut off a file, a cutting tool, or tempered steel spring, without drawing or reducing the temper. There is much mystery in the effect of this buz, and its cutting property is attributed to electricity. It answers a very convenient purpose, however, when the shape and form of articles are required to be altered without affecting their temper. It furnishes a convenient method for cutting teeth to large saws, but is objectionable on account of the newly-cut surface being left so hard that they cannot be readily filed. Connected with the subject of mysterious effects, it may be stated that a bar of iron of almost any size, may be instantly sundered while hot, by the simple application of a piece of common roll brimstone, A knowledge of this fact will be useful when some piece of iron work is to be severed, but which, as sometimes is the case, is so constructed and situated that no ordinary chisel or cutting tool can be brought to apply. Holes may be instantly perforated through bars or plates of heated iron by the application of pointed pieces of brimstone. This phenomenon is curious, although it seldom affords much practical utility.—*Scientific American.*

Assaying Metals.

This process is very often spoken of in the papers, but many persons, perhaps, do not know, yet would like to know how it is managed.

The miners grind the gold rock fine, keeping it wet constantly? and as it becomes fine, it washes off. They have a kind of hard stone for grinding. They then mix quicksilver with it, and that collects the gold dust. It is washed out, dried, and goes through some heating process. The gold dust is then usually sold to the superintendent of the mint. Sometimes the miners melt the dust and cast it into a bar before offering it at the mint. To find the value, each parcel has to be *assayed.* The assaying is the most curious and scientific of all the business in the mint. The melters take the gold dust, melt it, and cast it into a bar, when it is weighed accurately, and a piece is cut off for the assayer. He takes it, melts it with twice its weight of silver, and several times its weight of lead. It is melted in small cups made of bone ashes, which absorb all the lead; a large part of the silver is extracted by another process, and the sample is then rolled out to a thin shaving, coiled up and put into a sort of glass vial called a mattrass, with some nitric acid.

The mattrasses are put on a furnace and the acid is boiled some time, poured off, a new supply put in, and boiled again. This is done several times, till the acid has extracted all the silver and other mineral substances, leaving the sample pure gold. The sample is then weighed, and by the difference betweea the weight before assaying and after the true value is formed. All the silver over and above five penny weights for each lot is paid for by the mint at its true value. The gold, after it has been assayed, is melted, refined, and being mixed with its due proportion of alloy, (equal parts of silver and copper,) is drawn into long strips, in shape not unlike an iron hoop for a cask; the round pieces cut out with a sort of punch, each piece weighed, and brought to the right size by a file, if too heavy; when it is *milled*, or the edge raised, and put into a stamping press, whence it comes forth a perfect coin.

Preparation of Coffee.

In Silliman's Journal, we find a notice of a memoir on coffee by the distinguished French chemist, M. Payen. The results brought out by his chemical researches agree exactly with facts previously known in regard to this article. A great error in the preparation of coffee, is that it is burned too much, by which the liquid when it is brought to the table, is destitute of agreeable flavour, and has a bitter unpleasant taste. The reason of this is shown.

"Coffee roasted only till it becomes slightly red, preserves the maxium of weight and of aroma, but gives out less colouring matter.—In this state, 100 pounds are found to have lost 15, but have increased to the bulk of 130. Roasted to a chesnut colour, as is commonly done, the loss is 20 per cent., while the increase in volume is from 100 to 155. This swelling of the grain depends upon the property which the nitrogenous matter deposited within the tissue, has of puffing up remarkably when heated.

"If the heat is continued until a dark brown colour is produced, and the grain is covered with a sort of glaze, the loss is t venty-five per cent., while the original quantity of nitrogen, 2 45 per cen.t, is reduced to 1 77, being a loss of one-fourth."

The soluble matter was also found to be much greater in the coffee subject only to a low degree of burning—the brown giving 16, 15, the chesnut-colored 19, 00 per cent. The difference in "the aroma," it is added, "being nearly the same, the lower degree of roasting will produce not only the best and most nutritious beverage, but one free from the harsh and bitter flavor caused by the action of too high heat upon the nitrogenous matter.

The Farm.

Plant Trees.

Plant trees everywhere, we say; let them shade our streets, and grow wherever there is room for them. Especially plant them in the country, where open fields will admit, and be sure that in the end they will surprise the planter by their growth, whilst he and his children are sleeping! In evidence of this, let us quote an anecdote to the purpose. It is related of a farmer on Long Islabd, that he planted an ordinary field of fourteen acres, with suckers from the locust, (a native of the country,) in the year of his marriage, as a portion for his children. His eldest son married at twenty-two. On this occasion the farmer cut about $1,500 worth of timber out of his locust wood, which he gave to his son to buy a settlement in Lancaster county. Three years after he did as much for his daughter.—And thus he provided for his whole family, the woods in the mean time repairing by suckers all the losses it suffered.—*Brooklyn Eagle.*

Grafting Fruit Trees.

There is probably no branch in immediate connection with agriculture, more interesting, or more truly scientific, than the art of grafting. Long as this art has been known in its general principle, the art has recently taken an immense advance, and is yet but partially understood, by the most experienced practitioners. That a small twig, or even a bud or a small piece of the tender bark from one tree, being inserted in the branch or stock of another, should grow to be a main branch of the tree, but bearing fruit of the shape, size, colour, and flavour of that of the tree from which the bud or scion was taken, is of itself a wonder, and would be incredible if it were not common. This is already so far advanced that a fruit bearing branch is grafted upon the short stump of a nursery tree, so as to constitute a perfect tree in miniature, bearing fruit,—apples, pears, peaches, or plums,—though less than 20 inches high. Apples partaking of different kinds,—the sweet and sour flavor, for instance, in different parts, or opposite sides of the same apple may be produced by splitting longitudinally, the buds of different kinds, and uniting parts of different buds. But we know of no instance in which horticulturists have blended the properties of different kinds, though it evidently might be done without difficulty. Suppose a medium between a large tart apple and a small sweet and spicy kind was desired; it is only requisite to engraft one or more of the *roots* of the one, upon the roots of a young tree of the other kind, or upon those of a young stump grafted with the other kind. And on this principle carried out, almost any required properties of different kinds may be united in new kinds.—As this is the season for grafting, we expect that some of our fruit loving readers will experiment on this mode, not only with fruit but with roses and other shrubs.

To Multiply the Potato from thirty to a hundred Fold.

It appears not to be generally known that the potato plant may be propagated more abundantly, and with greater ease, than most other plants. The shoots produce roots naturally at every joint below the snrface of the ground when planted in the usual way; to plant for propagation, a small piece of ground will be sufficient, as the tubers may be placed close together; when the shoots have grown an inch or two above the surface of the earth, the tops may be cut off below the first rooted joint, and planted two or three inches apart in fine sandy earth; in the course of a week or ten days they will be rooted plants, and planted at the distances that potatoes are generally planted, will produce a crop of tubers in eight, ten or twelve weeks (according to the kinds) equal to that produced from tubers, and, when propagated in this manner, plants may be obtained in great quantities. A more simple way will be to place the tubers in a similar manner as before stated, and when the shoots have grown to the length of two or three inches above the soil, to take up the tubers and strip off the shoots from them; there will be six or more beautiful rooted plants, just in order for final planting; replace the tubers as before, which may be repeated at least four times, and this will produce sufficient plants from four or five tubers of a moderate size to plant a rod of ground, at the distances that tubers are usually planted. Lateral shoots taken from a growing crop, treated like cuttings of other plants, and afterwards transplanted, will also produce a crop of tubers equal in quantity to that produced by the parent plant.

Raising Young Quince Trees.

An intelligent cultivator of fruit has very successfully adopted the following practice for raising quince trees in the nursery. Instead of planting the cuttings of the desired variety into the soil, as by the usual method, he inserts each cutting as a graft into an apple root, precisely as in common root grafting. The cuttings commence growing rapidly at once, deriving as they do a full supply of nourishment from the root of the apple; and afterwards throwing out roots of their own, as they always do very freely, the apple root separates and dies, while the quince continues to flourish on its own roots. This is found to afford very handsome and thrifty young trees, and with much greater certainty than if raised simply by cuttings in the soil.

The same cultivator picked the past season *two barrels* of quinces from a single tree.—This tree is eighteen years old, and one foot in diameter near the ground. As with all the other trees in the orchard, the soil around it has been kept rich and constantly cultivated —*Cultivator.*

Quantities of Seed suited for a Cottage Garden.

Allowing for loss or accident in garden seeds, we believe the following quantities for sowing a common cottage garden, to be nearly correct:—

One pint of peas will sow fourteen yards of drill.

One pint of beans will sow twenty-two yards of drill.

One ounce of onion-seed will sow ten square yards.

One half ounce of leek-seed will sow six square yards.

One ounce of carrot-seed will sow ten square yards.

One ounce of parsnip-seed will sow twelve square yards.

One half ounce of cabbage-seed will sow three or four sqnare yards.

How much Seed per Acre?

One and a half bushels of rye—do. of wheat—three bushels of oats—and two and a half of barley, are believed to be the usual quantities for spring sowing in New England. Englishmen sow more seed than we do.—Some of us sow four bushels of oats, and some but two. Some sow two bushels of barley.—When grass seed is sown among the grain, it is not good to have the grain very thick.

Nitrate of Soda.—Mr. E. Bishop, of Seekonk, Massachusetts, informs the Boston Cultivator, that in the spring he put about forty pounds of nitrate of soda on half an acre of lighty sandy soil. This is the third year he has put it on with the like effect; and for six years he has put no other manure on his land. The quantity of grass on this half acre is four-fold what it is on similar land adjoining, which had nitrate on it. It bears a burden at the rate of two tons to the acre, while there is not more than five hundred pounds per acre on the rest. Mr. Bishop is much in favour of nitrate of soda for that kind of soil.

"As Dull as a Hoe."—How came such a phrase about—or what business has it in existence? Why should a hoe be duller than twenty other implements in use? Yet it is a fact that thousands of farmers will work, the season through, with a hoe one sixteenth of an inch, more or less, thick on the edge, and suppose all the time that this is the best condition that the tool admits of. Three or four minutes work, or thereabouts, will grind a hoe well, so as to save a great amount of strength, and do the work required far better than could otherwise be. No man thinks of mowing more than one day without grinding his scythe, which will employ a man and a boy a good half hour: two minutes spent upon the hoe in like manner before going into the field will be of scarcely less aid.

Rose Hedges.—The best Hedge in the United States, says the *Genesee Farmer*, extends about a mile along the highway, on a plantation of three hundred acres, near Augusta, Georgia. It is the Cherokee rose, which is now in full bloom, presenting a magnificent floral appearanee, and filling the atmosphere with a delicious perfume. No animal without wings, can get over it or through it. Having stood forty or fifty years, it still promises a good fence for a century to come.

A Newly Discovered Manure.

The St. Vincent Royal Indies Gazette mentions that a gentleman of that island has sent to England a quantity of pozzolona, to have it tested as cement, and was agreeably surprised to learn that the chemist who tested it had declared it to be the best manure that had yet ever been discovered, and that it was far preferable to Guano. The gentleman in question was complimented on having a mine of wealth, superior to gold. When it is considered (says the Gazette) that the island abounds in this valuable substance—the best cement, and, as it now appears, the best manure known, we cannot refrain from our public congratulations on the recent discovery, which must ere long bring great wealth into the island, by supplying them with an article which must be much needed by the sugar growers. Pozzolona from St. Vincent could of course be supplied here much cheaper than Guano, and might in consequence of its cheapness be extensively used.

To Give Tin the Whiteness and Brilliancy of Silver.—To an ounce of nitric acid, diluted with an equal quantity of water, add nearly one ounce of mercury, or as much as the acid will dissolve. When this is dissolved, add to the solution, gradually, half an ounce of sulphuric acid; this will precipitate the mercury in the form of a white powder; when this has subsided pour off the acid and clear water, thus wash the powder from the acid, then pour off the water, and while the precipitate is moist (or if it be suffered to dry, it may be again moistened with water,) rub it over the tin with a piece of glove leather.—Then wash the tin with water, and when it is dry, rub it pretty hard with a piece of fine woollen cloth; it will then resemble polished silver.

Knife Cleaner.—A simple "Knife Cleaner" may be made of two boards 20 inches broad, and one inch thick, joined together, but not close, by a hinge. Two pieces of buff leather are stretched over the interior surfaces, and nailed on the exterior ones, and a handle assists in holding the apparatus steady. In using it, lay brick or any simliar dust, powdered, on the lower leather; shut the boards together, lay the left arm on the upper board, holding the handle; put the knife, well wiped from grease, between the leathers, and four or five rubs backwards, not sideways, will produce a beautiful polish on both sides. The shoulders and back may be polished on the other part of the leather turned over.

Heat gotten by degrees with motion and exercise, is more natural, and stays longer by one, than what is gotten all at once by coming to the fire. Goods acquired by industry prove commonly more lasting than lands by descent.