

necessity of Revelation, and the insufficiency of the light of Nature. Hume came one evening to visit Robertson, and the evening was spent in conversing on this subject. The friends of both were present; and it is said that Robertson reasoned with unaccustomed clearness and power. Whether Hume was convinced by his reasonings, or not, we cannot tell; but at any rate he did not acknowledge his convictions. Hume was very much of a gentleman; and as he was about to depart, bowed politely to those in the room; while, as he retired through the door, Robertson took the light to show him the way. Hume was still facing the door: "O, sir," said he to Robertson, "I find the light of Nature always sufficient;" and he continued, "Pray don't trouble yourself, sir," and so he bowed on. The street door was open; and presently, as he bowed along in the entry, he stumbled over something concealed, and pitched down stairs into the street. Robertson ran after him with a light; and as he held it over him, whispered so tly cunningly, "You had better have a little light from above, friend Hume." And raising him up, he bade him good night, and returned to his friends.

Scientific.

Foreign Correspondence of the New York Organ.

LONDON, Nov. 8th, 1850.

GUTTA-PERCHA WORKS.

I made a visit one day last week to the "Gutta-Percha Company's Works," in London; and as they are the only company in the kingdom holding the original patent, and first imported gutta-percha from "over the seas," and, as a necessary consequence, are at the head of the world in their manufactures, I think your readers will like to have me describe what I saw. We had a long walk to take up what is called "City Road," for a mile or two, then turning abruptly to the right, we found ourselves before a large building in which the works of the Company are carried on. We were then introduced to the Manager, who is a man of politeness and urbanity, (qualities not too common in the business life of London) and sat down for a few moments in his office. Here I saw him (Mr. Smithers, the Manager,) give out orders for various departments of the large manufactory without leaving his position at his desk, by simply applying his lips to different mouth-pieces, close at hand, the sound being carried through gutta-percha tubes to the farthest corner of the vast building. In a few minutes, in company with my cousin and Mr. Heaps, (a gentleman who has recently applied the use of gutta-percha tubes to pulpits and churches, so that deaf persons may hear,) in company with these persons I repaired to the cutting department. Here the lumps of gutta-percha are sliced into thin pieces by revolving knives, which cut six hundred slices per minute, propelled by steam. The gutta-percha as it is imported from India is not fit for use—the collectors of it being very careless—and it must needs be purified. These slices which we saw are thin, and have the appearance of old leather. The manager took us next to the boiling and kneading room. The slices are first put into enormous boilers and boiled till of the consistency of tough dough, when it is thrown into a machine with rows of teeth, revolving eight hundred times a minute, and which tear the masses of gutta-percha into infinitesimal shreds. These shreds are put into cold water—the gutta-percha, pure and unalloyed rises to the top, and the dirt and refuse sink to the bottom. It is then skimmed off and put into lumps, to which a heat of 200 degrees is applied, and in this state the lumps are put into steam kneading machines to work out all the air and water that may exist in the pores of the substance. This is a very curious and interesting process—or at least it was so to me. After the material comes from the kneading trough, it is by machinery moulded into the thickness of common leather, and is ready for use, or perhaps, it is left in lumps, as occasion requires.

We then went into the room where soles are made for boots and shoes. The substance was in a plastic state, and while thus the soles are cut and shaped. The shoemaker, by applying enough heat, can shape the sole to the shoe; or any one can mend his own boots with slight trouble, by merely applying one side of the sole to a hot fire and at once placing it to the bottom of the boot—when cold it adheres better than if it had been pegged on, and will not only out-wear leather, but will entirely keep out the wet. There are many boys in this department, and I ascertained that their wa-

ges were about one dollar, and a quarter or a half per week—they of course boarding and lodging themselves.

We next visited the tubing-room, and saw the process of making tubes. A very long one was being tried; it was for a mine down in the country; the mouth piece was to be above ground, from which orders could be given to workmen in the vaults below. It was four hundred feet long, and was well constructed. Here, too, pumps were being made, pipes for fire-engines, and all manner of tubes. Here we saw the identical electrical wire, covered with gutta-percha, which a few weeks ago connected England with France—the true chain of brotherhood. The manager cut us each a piece as a memento of the great feat of connecting Paris with London by electricity, though twenty miles of sea intervenes between them. The project is not given up, nor has any one connected with it even thought of a failure. Better ground will be chosen next time, and the wires so laid that they will avoid the reefs of rocks near the French coast, which proved fatal to the tubing before. While over these wires the subject of connecting America with Europe was discussed, and the manager said wisely, "There's little use in saying what can't be!"

We next visited the most interesting department of all—that where the nicer and more delicate articles are constructed. Here I first saw a beautiful frame, with the borders exhibiting every appearance of the finest carving, and the inner portions exquisitely gilded. Really I was astonished that gutta-percha could thus be made to resemble the choicest carved or gilded wood, oak, rosewood, or mahogany. And not with the chisel, but merely by pressing the ungainly lump into a mould. So that once a mould constructed, hundreds and thousands of these beautiful frames are turned out without the expense of artist-work. And they have this great advantage over wood, that they can never be broken. You can dash them to the ground with all the strength in your power, and you can't injure them a hair. I saw some delicate-looking flower-vases, and the manager took one of them in his hand and threw it to the floor so that it bounded back into the air—it was not harmed in the least. Here, too, we saw beautiful works of art—the head of a deer with the ears falling like real ears, and yet you could not break the slender horns—they would bend, but not break. Impressions of faces and busts were hung about the room, or were issuing forth from the moulds in the hands of ingenious workmen. I saw the face of Elihu Burritt among others. I saw also some stereotyping that had been done with gutta-percha. There were drinking cups, a beautiful gutta-percha life boat, which though full of water, and without the usual air-bags, will not sink, gutta-percha is so much lighter than water that it will not sink. There were sou-wester hats for sailors, capital things—for gutta-percha is impervious to water, and salt does not affect it in the least. With leather it is otherwise, for water saturates it, and salt is its deadliest enemy. There were any quantity of lines—clothes-lines, and—would you believe it—lining for bonnets, soft, and flexible as silk, and yet made out of gutta-percha! Stranger yet, there were bottles of liquid gutta-percha, for wounds, and cuts, and chilblains. Really this beats all—you cure a sore finger with the sole of your shoe. There were stethoscopes, buckets, inkstands, wash-basins, battery-cells, insulating stools, driving-bands for threshing machines, and powder-flasks, speaking-trumpets, tiller ropes, lining for coffins, whips, canes, port-manteaus, knife-handles, and so forth!

Is not this strange, when you recollect that the first sample of gutta-percha which ever saw England was sent by Dr. Montgomerie in 1843. The tree of which it is the sap was discovered by an Englishman in the forests of Singapore. The tree is said to bear much esteemed fruits, the timber is good, and ardent spirit is made from it; a medicine, and the flowers are also used for food. The first year only two hundred weight of this sap (turned into gum) was imported into England; but last year over 30,000 cwt. were entered at the docks. It is used for everything; Mr. T. H. Heaps is fitting up the chapels and churches of England with his hearing-apparatus, so that the "deaf may hear" the Gospel.

That I was much interested in my visit to the Company's works I need not tell you. Bidding the gentlemanly manager Mr. Smithers, good-day, we left for home.

Study most the sciences which lead to a knowledge of thyself.

Sugar Manufacture.

The process of sugar-making in the South is described by a correspondent of the Louisville Christian Advocate, as follows:—

They had finished making sugar before my arrival, but Mr. H. took me all through the sugar-mill this morning, and explained the whole operation of sugar-making. The building is of brick, with a good steam-engine, the whole costing about \$20,000. Behind the mill is a large shed, under which the cane is thrown, so that the mill can be run in all kinds of weather. The cane is here placed upon an endless chain, which conveys it into the mill and between the rollers, where it is crushed. When thus deprived of its juice it is called bag gas. The juice, by means of troughs, is conveyed into large vats or tubs, and from thence as it is needed into the kettles which occupy a separate room. There are five of them of different sizes; the first, the largest. When the juice comes to a boil in this, it is skimmed and dipped into the next; then into the third, etc.—By the time it is boiled in the fourth it is what called cereau, or syrup. It is gratulated in the fifth, and then conveyed into vats, where it soon forms a crust upon the top, which has to be broken and stirred three times. It now forms a wet mush, which is shovelled into hand-barrows, and thrown immediately into the hogheads which are ranged in rows in another room. This room is very large, and the whole of it underneath the hogheads is one vast tub, made to hold the molasses which drips from the wet sugar in the hogheads. A view of this dark "sea of sweet," with the thoughts of the dirt that must necessarily drop into it, and the flies, mosquitoes, bugs, rats, and mice, which may, probably, be drowned therein, I think would cure the fastidious, at least of all fondness as for sugar-house molasses. It should always be boiled over before using, which greatly improves its taste as well as purifies it. The planters never use the molasses themselves, but use the cereau, or golden syrup, as we call it in Kentucky.

The Farm.

FALL PLOUGHING.

The question is often asked, whether fall ploughing is advisable? It may be advantageous or injurious, according to the character of the soil and the circumstances under which it is performed. Soils which are too loose in their texture are liable to have their soluble matter drenched out of them, if stirred late in the fall, by the heavy rains of winter and spring. Hill-sides are also liable to be washed and gullied by the same causes.

Again, the particular time in the fall at which ploughing should be done, is an important point, and this must be determined by the objects which it is sought to attain. If the land is in grass, and it is wished to have the sward rotted by the following spring, the ploughing should be done early in autumn, in order that the warm weather may bring on decomposition before winter. If ploughing is deferred till the commencement of cold weather, but little change will take place in the sward before spring—so little that if cross-ploughed, much of the grass will be found alive, and by being brought again to the surface, will grow and obstruct the growth of the crop which is put on the land, or increase the expense of cultivation.

On clayey soils, there is still another disadvantage in connection with late ploughing, if it is done in the ordinary way. The soil is liable to be made into mortar and run together by rains, so that by seeding-time it becomes closely packed. It is difficult after this to bring the soil into the friable condition required to fit it for crop, without ploughing again, and that operation would bring back the undecomposed sod, to which, as just remarked, there are weighty objections.

So far as regards the improvement of the texture of soils, it may be assumed that those of a clayey and tenacious nature, and those only, may be benefited by late ploughing. The improvement in such cases results from the division of their particles by the action of frost; by this their cohesion is overcome, and access given to the air, which dispels acids injurious to vegetation—thus rendering soluble and available to plants the food which was before inert. But these desirable results can only be obtained by the soil being frozen when it is in a comparatively dry state. If it is wet at the time it is frozen, and remains so till it is thawed and settled, no pulverizing effect is produced, the favorable agency of the

air is excluded, and the soil remains in an ungenial state.

To obtain these advantages of frost, the soil should be thrown into narrow ridges, by turning two furrows together, in the manner called back-furrows. The furrows should be made in the direction best calculated to drain off the water, without allowing it to form large streams as these might gully the soil. This kind of ploughing can be done to best advantage on land that has been under cultivation one season, or more. It can be done with sward ground, but, as before stated, the grass will come to the surface when it is crossed-ploughed in spring, requiring much labor to destroy it. If, however, sward-ground were ploughed in August or the first of September, the sward would become dead and so far decomposed by November, that it might be crossed ploughed in ridges with advantage. The later in the season the ridging can be done the better, as the soil will be more fully exposed to the action of the frost, before the ridges have been washed down with rains. The ridges should be made as high and narrow as practicable, in order that the frost and air may act thoroughly on the soil.

There is no operation which tends so much to produce friability in tenacious soils, or which so much develops their fertility, and insures the growth of crops, as ploughing them late in the fall, in the manner above described. But to derive the full advantages of the operation, the soil should be properly under-drained. This will admit the descent of water so readily that the soil will remain permeable and open; but if the water remains long in the soil, the beneficial effects of pulverization will be comparatively temporary. The soaking of the soil will reduce it to its former heavy condition.

Other advantages are claimed for fall ploughing, which do not relate to the improvement of the soil; such as that of the destruction of worms, in some instances the killing of noxious plants, and in other instances the convenience of doing the work at a season when the farmer has more leisure, and his team is, perhaps, in a better condition to labour, and may be kept at less expense than in spring.

As to the destruction of insects, such accurate experiments have not, so far as we know, been made, as would show the advantages of fall ploughing in this respect. It may be remarked, however, that worms prepare themselves for winter by descending into the earth more or less; and if, after they have fixed themselves in their position, they are turned up to the air, while the weather is so cold as to prevent their motion, it is reasonable to suppose that before spring many of them would be killed. It is thought that this has been favorable to the destruction of wire-worms, which are generally most prevalent on deep soils, and those of a mucky character, though they sometimes do much injury on clays.

Witch grass, or couch grass, (*Triticum repens*), may be to some extent destroyed by ploughing just at the setting in of winter. Those who have had experience with this pernicious grass know how great a nuisance it is, and how difficult to eradicate. To destroy it by frost, the ground should be ploughed deeply in ridges. The plough should run, if practicable, to the bottom of the roots, that they may all be, as much as possible, exposed to the air and frost. The rains will wash out much of the earth, especially in sandy soils, leaving the roots bare, and the alternate freezing and thawing in this situation will deprive many of them of vitality.

Protecting Tender Plants and Shrubs.

There is one principle which should not be forgotten, whatever be the nature of the covering applied to tender plants, more especially to the wooden portions or parts above ground. This is, that the exclusion of moisture is an important object without excluding air. Ligatures are sometimes left on inserted buds for protection, and more usually destroy the buds by retaining water like a sponge. Closely wrapped straw operates in the same way, as well as by excluding air, which is often important. Roots and stems like those of the grape, which will bear a greater degree of moisture, are partial exceptions. Roots, even, are often destroyed when in a too moist soil; and there is no doubt that many tender herbaceous perennials would survive the rigors of our winters, if in earth with a dry bottom, and sheltered from rain.—[Albany Cultivator.]

Unheaded Cabbages may be rendered fine for spring use by transplanting them in a close double row, and then covering them with boards like the steep roof of a house, with an additional coating of a few inches of earth.