

inches high, as could stand upon it; or equal to a stratum of mercury, of the height just mentioned, extending all over the surface of the globe.

It has been shown, that the height of heterogeneous fluids, reciprocally resisting each other, are inversely as their gravities; or, in other words, that they are as much higher, as lighter; as much lower, as heavier. The height of the column of air which, by its pressure, elevates the mercury, must, therefore, be as much greater than the height of the column of mercury, as the weight of the mercury is greater than the weight of the air; supposing the air of uniform density. Mercury is 11152 times heavier than air, and of course the height of the atmosphere would be (if uniform in density) 11152×30 inches = 27.880 feet; supposing 30 inches the height of the mercurial column supported.

Hence the atmosphere, if of the same density throughout, as on the surface of the earth, would not extend much above the elevation ascribed to the highest mountains.

But as the pressure of the atmosphere causes its density, it may be demonstrated, that, the heights increasing in arithmetical progression, the densities will decrease in geometrical progression. Thus the density at 3 miles being, by observation, one half of what it is at the surface of the earth;

At 6 miles it will be $\frac{1}{4}$

9 - - - - $\frac{1}{8}$

12 - - - - $\frac{1}{16}$

15 - - - - $\frac{1}{32}$

At 18 miles it will be $\frac{1}{64}$

21 - - - - $\frac{1}{128}$

24 - - - - $\frac{1}{256}$

or, rarer than we can render it by the finest air pump.

These results have been verified, to a considerable extent, by actual observation.

Observations on the May-Bug, and its ravages on Plum, and other Trees, and also on the means of preventing the mischief.

New Jersey, May 23d, 1826.

TO THE EDITOR OF THE FRANKLIN JOURNAL.

SIR—Being convinced, by observation, and by reading several papers on the subject, that our plums were stung by an insect for the purpose of depositing its egg, and having often seen the egg and the worm when hatched, I was determined both to learn the history of the insect, and to endeavour to prevent the mischief it caused.

The insect of which I speak, is called by some, the May-bug, or Doree-beetle. It belongs to the order *coleoptera*,* and it deserves the attention of every one interested in agriculture and horticulture. In three months after the eggs are deposited, either in the plum, cherry, apricot, peach, nectarin, or in the earth, this insect assumes the form of a small grub or maggot. If it be deposited in fruit, it works its way to the kernel, and the circulation being destroyed by its ravages, the fruit falls to the ground. The worm then crawls downwards, and finds its way to the roots of vegetables, on*

* *Scurabæus Melolontha*. Linn.

which it subsists for *three years*, going lower and lower into the earth every winter as it increases in strength and size. When it has attained the size of $\frac{1}{2}$ an inch caliber, and from an inch to $1\frac{1}{2}$ inches in length, and has remained in the grub state for three years, committing every sort of waste and destruction; it digs its way down in the earth to the depth of 6 or 7 feet, when it scoops out for itself, a commodious habitation. It here shortens itself, swells, and finally bursts its last shell, and assumes the form of a chrysalis. This occurs in January or February, and in a little time, the beetle is formed. It remains in an inert and imbecile state, under ground, until the beginning of May, when it again commences its ravages, and after stripping the trees of their leaves, and perpetuating its species, it either returns to its holes and perishes, or else (its thirst being very great at the close of its career) it flies to ponds and rivers, and is seen no more. This is the formidable insect that preys on the industry of man. This is the *corn grub*, the *cut worm*, the *wood maggot*, the *potatoe worm*, the *cabbage worm*, and in short, occasions the loss of our Indian corn, of our cabbage, of our potatoes, of our fruit, and of our trees. There are many varieties of this mischievous insect; but this chesnut coloured beetle, is the worst, for its life is continued to four years, and at every stage, it does an immensity of mischief. It has unfortunately happened, that the rotation of crops in our district, has been favourable to the increase of this insect. Clover grounds and grasses, of every kind, being its hiding place during the day, whilst in the fly or beetle state. They are this year, more numerous than I have ever known them, at least, it so appears to me now that I have begun to understand their movements. I have thus far, at certain points, defended myself from their attacks, and if I ultimately succeed, I shall be well repaid for the labour it has cost me.

It is *possible* that pungent odours *may* deter them from alighting on a tree, but I doubt it; *actual manual* labour is the only preventive to the scourge. As soon as I became acquainted with their movements, and saw, or rather heard that they had commenced their destructive work, for they only leave their holes at dusk, I began to work. I spread a large sheet or wagon cover under a tree, and giving the trunk a sudden blow with the flat of the hand, the beetles fell on the cloth. Some young plum trees had from 40 to 60 large beetles clinging to their limbs, and leaves; but the slightest touch makes them drop as if dead. As soon as they dropped, I had them gathered and thrown into a *tin* pail of water, that was brought for the purpose. In this way I cleared 50 trees in half an hour. Two persons held a light, and two picked up the beetles. The quantity that we picked up the first night, is incredible. At dusk, the second night, we began again, and had not quite as many as the first night. They were reduced in number every succeeding night; and last night I only found one or two on each tree, whereas, on the English walnut, and European ash, and other trees near them, I saw them as thick as ever. One plum tree, that stood a little out of our way, but which we had always stripped of the beetles, was forgotten last night, and I ob-

served, this morning, that several of the plums were stung. In a few nights, I think that these trees will be safe, for when they once commence laying their eggs, they disappear. The trouble is not worth a thought, compared to the benefit derived from it; I hope by ploughing deeply in the fall, and early in April, that I shall in a few years, get rid of these destructive insects. I am induced to believe, that the same set of insects frequent the same tree, and return to the same holes, that they occupied during the day. They are not more than ten minutes from the time that they first fly from the ground, until they all fasten themselves on a tree, and I think that if I could have staid that time at one tree, but very few would have been found afterwards on *that* tree, but I was obliged to go very quickly from tree to tree; of course many alighted on the same tree, after we left it. No one in my neighbourhood, this season, was aware of their existence; nor has any one pursued the same method of extirpation that I have; but I have taken great pains to make every one acquainted with the minute history of the beetle, and of my mode of destroying them; I hope that many others, now, will go seriously to work by fall-ploughing, and by watching them in the month of May. I have entirely banished the peach worm, or fly, and I am certain that I can rid myself of the beetle.

I tried small bonfires, but although I destroyed myriads of ephemera, and many millers, yet but few beetles were either attracted by the light, or deranged by the odour.

I observe, too, that the locust is making its appearance, my woods are full of them. I am fearful that they are going to be troublesome.

A.

Society (in France) for the Promotion of National Industry.

This Society was established in Paris, many years prior to the revolution; after suspending its operations, it was revived in 1804, by the association of a number of persons eminent for their learning, statesmen, landholders, manufacturers and others, distinguished for the liberality of their views.

Its principal object is to second the efforts of the French government, for the improvement of all the different branches of National Industry. 1st. By the distribution of prizes and medals. 2d. By instituting experiments, to test the value of new processes. 3d. By advancing funds to aid artisans and manufacturers, in the construction of machines, and the completion of processes, of evident utility. 4thly. By the publication of papers, containing descriptions of discoveries relating to the useful arts, whether made in France, or in foreign countries; with drawings of such models, or machines, as may require them.

Such are the means adopted by the Society, for the attainment of the end proposed. Among the premiums offered we find the following:—

For the construction of a rasp, and of an economical press, for ex-