From The Monthly Visiter.

ASHES.

Mr. Hill,—I have read in several of the agricultural papers, within a few months past, various accounts of the value of ashes in agriculture, both leached and unleached, and, in most cases, their application was attended with decidedly beneficial results. But there is a great difference in the value of soapers' leached ashes, and those from the pot or pearl ash factory. Dr. Dana says, "the soap chandler, in leaching ashes, uses about one peck of lime to each bushel of ashes." This is used for the purpose of taking up the carbonic acid in the ashes, which makes the ley *caustic*; it then readily combines with the oil or grease, and forms soap. The lime used with the ashes is "quick lime," or in other words lime that has had its carbonic acid driven off by the process of burning. After being leached it is carbonate of lime, from the carbonic acid derived from the ashes, and is chemically the same as before being burnt. Then in 125 bushels from the soap boiler's, we got 100 bushels of leached ashes, and 25 bushels of corbonate of lime. The manufacturer of pot or pearl-ash, covers the bottom of his leach-tubs with swingle tow or straw, and puts over it a bushel or two of slacked lime, and does not renew the lime again during the season of making; consequently, there is no lime mixed with the leached ashes from the potash.

From the above facts, every one will see there is a material difference in the value and effects of the two kinds. Therefore, the farmer that uses leached ashes from the potash, expecting to realize the same results as those do that make use of soaper's ashes, will be likely to meet with disappointment. I have never seen Dr. Dana's "Muck Manual," but have read a few extracts as published in the agricultural papers. In one of them, the doctor goes into a calculation to prove that soils are not exhausted of their lime and ashes by cropping or cultivation. For by his figures he makes out that an acre of soil to the depth of six inches "contains 3,626 lbs of lime, and 73,311 lbs of potash, or nearly 1¾ ton of lime, and 36 tons of potash." Well, every farmer must say there is enough in all conscience to lime and potash in his soil; and I do not at alf dispute the doctor, but if there is that amount I believe it is nearly insoluble, and therefore of little use. Liebig says, the lands in Virginia, by long cultivation, become entirely unproductive in wheat, for *want* of potash in the soil; he says (if I recollect right, it being more than a year since I have seen his book) that there is twelve pounds of potash annually carried off the soil in the grain and straw of an acre of wheat—1200 lbs in a hundred years. But, according to Dr. Dana's statement, there would be left *there*, in the soil, some 36 tons of potash per acre. Now, Mr. Editor, I am a "plain, practical, every-day farmer," and shall not attempt to decide, where learned doctors disagree. But being willing to contribute my mite, for the benefit of our *craft*, I will state a few facts, and give my views, with the hope that they may result in further investigations, but not having the happy talent of saying much in a *few words*, I hope you and your readers will excuse the long yarn I am about spinning.

I think I can furnish a few facts to prove that the application of ashes to the soil, in addition to the 36 tons, is attended with beneficial results. I believe also the part that ashes perform in agriculture is not fully understood. The general opinion is that it acts as a stimulant to the growing plants, and a decomposer to vegetable matter in the soil, and perhaps the above opinion is partially correct. I apprehend the most important part ashes perform in agriculture, is in decomposing *silica*, and rendering it soluble, so as to be taken up by the rootlets of plants, and by proper vessels carried to every part, and there assimilated and applied to the various purposes for which nature intended it, viz., to form the skeleton of the plant or tree, the glaze on the corn-stalk and kernel, the outer covering upon wheat and other straw and grasses, &c. The material of this glaze is derived from that kind of rock called quartz (sometimes called rock chrystal or white flint stone), it is dissolved and rendered soluble by an alkali. Some kinds of trees require a much larger quantity of their structure than others, and produce a much greater amount of ashes upon being burnt. The burning of wood converts it again to silicia, the insoluble part of ashes is mostly silex. Oak requires a much larger amount, as it is much heavier than pine wood. To prove the solubility of silicia by potash, I will state a few plain facts, because we common farmers want facts, and illustrated in a way that we can understand them. From the fact that ley dissolves the silica in wood, tubs for leaching ashes are usually made of pine, as they are not so powerfully acted upon by the ley as if they were made of oak. An oak tub, after having been used a few times for a leach tub, would have its silica dissolved, and a stave four inches in width upon being dried, would shrink to two inches, wholly in consequence of the dissolving of the silica (gritty part). But the ashes do not operate upon the vegetable tissue, or fibre of the wood.

When it was the custom of farmers' wives and daughters to spin their thread from flax, the next process was to boil it out *in ley* to soften and remove the harshness of the thread by dissolving the minute particles of silex, but it did not destroy the strength of the vegetable texture. Manufacturers of paper from straw go upon this principle: the straw is boiled in lime water or ley, the glaze upon it is dissolved, and the vegetable fibre is unharmed. From these facts, then, it would seem the alkali acted upon the inorganic rather than upon the organic or vegetable matter.

Dr. Dana's statement of the amount of potash may be correct; but I will try to prove that I am right in my conjecture as to its being insoluble, and therefore inert. Common granite is the prevailing rock in New-England, and is composed of three different minerals—quartz, felspar and mica; quartz is supposed to be of an acid nature—felspar contains 12 to 15 per cent. of potash—mica from 5 to 8 per cent. of potash Chemists tell us that the rootlets of living plants and trees have the power of decomposing *granite* rock, to obtain the potash we find in their ashes, 'Tis said, "the living plant is a consummate analist" I will, though with much diffidence, give you my theory of plants decomposing rocks.

The decomposition of vegetable matter always produces an acid—or in other words the decaying or rotting, or more properly the slow combustion of vegetable matter partially converts it into carbon. The oxygen of water combines with the carbon and produces carbonic acid. This acid in its liquid and gaseous form, having an affinity for the alkali in the rock dissolves it; the alkali dissolves the silica (quartz), and by the endosmose principle of the living plant, the water holding these in solution is drawn up by the rootlets, and these salts disposed of and assimilated to the purposes designed by the first great cause. In proof of this position I forward you a piece of rock, not acted upon by the "living plant," but by decomposing vegetable matter, and it will convey to your mind a better idea of my meaning than I can by the pen.

In some situations, there is a superabundance of alkali and silica—in others just the quantum needful; and in others a deficiency. These propositions I think I can explain to the satisfaction of you and your readers. Upon the banks of a small river, running through this town, there is frequently a strip of land one or two rods in width, and sometimes several rods in length, a few feet above the bed of the river. Upon every overflow of the banks by a freshet, there is left upon them a deposit of gravel and fine sand; yet every year these strips produce a tolerably heavy crop of red-top grass, generally free from any mixture. When secured in good order for hay, it has every appearance of first rate winter fodder. Yet our cattle will not eat it unless nearly driven to the borders of starvation. Again, there is a similar kind of grass, only more wirey and jointed, growing upon our gneiss and granite ledges, and frequently quite a thick growth of it, where the soil is but two or three inches in depth; it is red-top grass, but from its small and narrow leaf and wirey appearance, but few persons would suppose that it was the same kind of grass that was growing within six feet of it, where the soil was deeper. The grass on the river bank, from the comminuted and fine particles of quartz, feldspar and mica, takes *on* and *in* such a quantity of silica, that it is hard and difficult to masticate, and probably it is not so nutritious as if grown where there was more vegetable matter in the soil. That, upon the ledges, the roots of the grass rest directly upon the rock and decompose it: this contains more silica, and is harder than that upon the river bank. This establishes my first proposition.

There are other situations where all the necessary constituents for a perfect development appear to be rightly balanced. With such spots all our farmers are familiar. They are found wherever the wash from rocky or gravelly roads is carried over grass lands, the wheels of carriages and travel on the road are continually grinding to powder the component parts of stones and rocks in the road, which renders their salts soluble. This with the animal and vegetable matters are sprayed over the ground by every heavy shower; the result is a heavy crop of grass. Herdsgrass in such places is frequently found four or five feet in height, standing perfectly erect till mowing time, and affording palatable and nutritious food for cattle. This I offer to sustain in my second proposition.

My third was, that there were others where there was an absolute deficiency of potash and silica, but an abundance of nutritious matter. Where a piece of land has the wash of a barn, the grass starts early in the spring, and bids fair to yield a great growth of grass; but for want of stamina it frequently falls or lodges before it heads out, and when made into hay it will weigh light according to its bulk: much of this is occasioned by a deficiency of silex. The same results are frequently exhibited on reclaimed meadows, where there is a great amount of decaying vegetable matter. A compost of manure, with a large quantity of ashes and fine sand, is the rich dressing for such spots.

When the primitive growth of wood on our new lands is felled and burnt upon the ground, and there is sometimes two or three hundred cords per acre, and none of the ashes carried off, we almost invariably obtain a heavy crop of wheat or rye. I have known of more than 50 bushels of wheat, or 60 bushels of rye per acre on such lands. The intense heat shivers up the rocks: the great amount of alkali readily dissolve the disintegrated rock, and, in its soluble state, it forms a stiff stalk, with a hard, thick glaze upon the straw, which prevents the rupturing of the sap vessels; the sap, instead of oozing out upon the stalk, and rusting, is carried to the head of the grain, and;