communication with the atmospheric ingredients, or, in other words, manures ought to be applied which in part decrease the binding power of the clay, by which means the earth becomes looser and more porous.

This effect will be produced by the application of a marl, which contains more sand than clay, besides a proper quantity of carbonate of lime, or, in the absence of this, air-slaked lime, which has nearly the same influence, and it seems to me that the application of this substance is especially appropriated to this class of soils of which I presently speak. The carbonate of lime in the marl takes its place between the clay, humus and sand particles of the soil, and tempers by its presence the tenacity and binding power of the clay ; in consequence of which the soil may easily crumble, and its impenetrability to water and the ingredients of the atmosphere may decrease ; whilst the proportion of sand and clay in this kind of marl supports this effect. The analyses of these soils always show a deficiency of lime relative to the proportion of sand and alumina in them.

The soils of Alleghany county are those which are formed by fragments of clay slates, of gray sandstone, red sandstone, limestones, &c. They are loamy, rather calcareous soils, as we see by their analyses above given, and show, as a consequence of their composition, that they are, pervious to the influence of air, and permit the rain-water to penetrate them intimately, not to rest upon them, so that wet seasons will not do any harm here: a dry season is rather to be feared.

The defect in these kinds of soil, is especially their little depth and the want of uniformity of their particles, inasmuch as we find large fragments of rocks intermingled with fine and coarse ones, as the constituents of their body. In this matter, therefore, our point of view ought to be directed especially to the deepening of the soil, and to the restoration of its uniformity, both of which will be done by means of a decomposition of the rocks. We have previously seen that the decomposition of volcanic rocks was done by the action of water-slaked lime on them ; here a chemical action, that of lime, was induced to a chemical compound (silicates), and the good result was the consequence of a chemical process. In this case, however, the *chief* compounds present are not *chemical* compounds. Those rocks above named, consist principally of a merely mechanical mixture of substances which we also find in soils, and their separation, of course, must therefore also be done by a mechanical process. The application of lime on these soils would also be inadmissible, for a second and third reason, inasmuch as lime is already in abundance present in them, and the whole action of the lime would restrict itself to the decomposition of the humus, the quantity of which is rather deficient. Lime would act on this soil as on many other soils, for