in this state, would rapidly evaporate, but lime being at hand, it unites with it, forming a salt of lime, called sulphite of lime. On more prolonged exposure, the sulphurous acid becomes changed into sulphuric acid, (oil of vitriol,) which unites to the lime, and forms sulphate of lime, (gypsum.)

There not being a sufficient quantity of sulphur present to make enough of sulphuric acid to unite with all of the lime, a part remains as carbonate of lime.

It will be seen from the above short description of the changes going on in gas house lime, that at certain periods we have in it: 1st. Sulphuretted hydrogen;—2d. Free sulphur;—3d. Sulphite of lime; and 4th. Sulphate of lime;—at one and the same time. Phosphate of lime is always present, and undergoes no change.

When it has been exposed for some time, we then have in it only gypsum, air-slaked lime, and the phosphate of lime. Should this lime be applied when first taken from the gas house, after being used to purify gas made from coal, containing a large proportion of sulphur, its action will be as follows: Whilst the sulphur remains unchanged, the usual effects of lime will be produced; when it becomes converted into sulphurous acid, it will not only counteract the good effects of the lime, but destroy all vegetation; when the sulphurous acid becomes changed into sulphuric acid gypsum is formed, and we have its effect superadded to air-slaked lime. Gypsum, as has been *demonstrated* by Liebig, is decomposed by contact with the ammonia of the atmosphere, one of its elements uniting itself to it, thereby *fixing* it—in other words, destroying its volatility. But its use does not stop here—*it also affords sulphur, which is absolutely necessary to the formation of the nutritious parts of all substances used as food by men or animals.*

That the above will be the effect of gas house lime, under certain conditions, there can be no doubt. It contains sulphuretted hydrogen; this sulphuretted hydrogen *must* become converted into sulphur; this must and does become converted into sulphurous acid; but sulphurous acid and its salts, we have the highest authority for saying, will, "even in very minute quantities, destroy all vegetation."—*Christison on Poisons*, p. 750. And I am assured by a gentleman of the highest authority, that the application of from thirty to fifty bushels per acre destroyed one crop, and that after that it acted well.

I have also known plants in a green house destroyed by fumigations of sulphur, sulphurous acid being formed. When sulphuric acid is formed in the gas house lime, as formed it must be, gypsum at the same time comes into existence; and we will have its action and that of air-slaked lime manifest, provided the soil to which it is applied be deficient in sulphates and lime.

What quantity of sulphuretted hydrogen, or free sulphur, must