CHAPTER IV.

Chemical and Physical Geology, and its relations to Agriculture.

In this chapter we propose to consider the changes which have taken place and are still occurring inr ocks and minerals, and by which soils have been formed.

When we examine a rock jutting out upon a hill-side, especially if the structure be granular, we shall usually find portions of debris (or the results of its decomposition) near its base. If we expose the surface of a rock which has been covered with earth, (not deposited thereon by water,) we shall often find as we dig downwards a portion of mineral matters such as exist in rocks of its kind showing less and less complete disintegration, then a soft crumbling rock, until at length we reach the solid rock itself apparently unchanged. These facts show that in such cases the rock has been slowly altered by atmospheric agency, and that the earthy covering consists of such of its mineral matters as have not been dissolved and carried off by water.

As was stated in Chapter II, the facility with which rocks are disintegrated varies with their structure and chemical contents. For instance, a pure sandstone with a siliceous cement disintegrates very slowly, and the soil produced from it must be shallow and more or less sterile, whilst many varieties containing numerous grains of minerals easily acted upon disintegrate more readily, and produce better soils. Some varieties of granite as well as gneiss abounding in quartz are slowly acted upon, whilst others in which certain kinds of felspar and mica largely predominate, disintegrate more quickly, and give rise to soils of better kinds. And so on with other rocks.

With these examples, by way of illustration, I shall proceed to consider the geological changes which have occurred within the limits of what is now the State of Maryland, in connexion with the physical and chemical forces which have and will continue to act upon the mineral components of the earth, and by which soils are produced.

There are those who might feel an interest in a full investigation of the origin of the geological formations of our State, including their successive formation beginning with the oldest metamorphic and intrusive rocks. This, however, is too wide a field to enter into at this time, and would be scarcely compatible with the object of this report.