

constant washing down the fine matter through the soil. The disadvantages of these soils are, that they have not beneath them inexhaustible supplies of all the requisites for plants, as in some other formations. They appear to be deficient in phosphates and chlorides as well as in lime, but generally contain alcalies.

The middle cretaceous, or *iron ore clays*, (No. 22,) are usually too stiff for profitable cultivation, but when mixed with the sandy strata are productive, owing to the presence of alcalies, sulphurid acid and other matters. They require, however, further examination.

Owing to causes before stated, in Chap. III, the upper beds of the cretaceous, have not yet been much explored in our State. Some of them, although largely composed of siliceous sand, produce fine crops of tobacco, corn and even wheat, owing to the presence of phosphates and other matters, derived from fossils they contain. Others consist of mixtures of siliceous and green sand and marine shells, with intercalated beds of blue and gray sandy clays, some of which contain fossils. These produce some of the most valuable soils in the State, as in the southern part of Cecil and Kent, and in Anne Arundel and Prince George's counties.

Owing to an almost horizontal position of these strata, which have a *very* slight southern dip, the surface boundary between the cretaceous and lower tertiary is very indistinct, and will require a minute survey to determine.

The lower tertiary appears to consist of clays with some fine sands, but the soils they produce are more tenacious than those of the upper cretaceous. In passing from the last, southward in the middle parts of Prince George's and Anne Arundel, and in the northern part of Kent, we first notice these tertiary beds on the highlands with the more sandy beds lying beneath them, the level of which becomes lower and they finally disappear under the lower tertiary. In a single field we find decided differences in the soil, but where they are more or less mixed together by nature, the land has, in some measure, retained its fertility for two hundred years; and this, under a system of cropping, that probably would have completely exhausted any other soil, except in the valley of the Nile, which is annually manured by the overflow of the river.

The beds of the middle and upper tertiary as well as the post tertiary, successively appear further south and seem to have been made up of the detritus from all the older formations which have been noticed. Whilst these were being deposited beneath the salt ocean, marine animals flourished in great abundance, whose remains of shells, corals, etc., constitute the valuable shell marls of several of our tide-water counties.