

this lake. They extend as far North as the latitude of Lake Kissimmee and beyond, and are so flat and nearly level that when Lake Okeechobee reaches its high water stage, this country is saturated and partly submerged except in the cases of isolated hammocks and pine lands. (Report of J. O. Wright, Supervising Engineer U. S. Department of Agriculture, Office of Experimental Stations, June 25, 1909, and also field notes of J. T. Stewart, U. S. Drainage Engineer in his report to Dr. Elwood Meade, Chief of Irrigation and Drainage Investigations, May 18, 1907, U. S. Department of Agriculture.)

Allusion is made to this phase of the subject, in order to emphasize the great importance of the drainage scheme, not only for the reclamation of the Everglades proper; but as a collateral and necessary adjunct thereto, the further reclamation of these other millions of acres of lands.

## Character of the Everglade Soil When Drained.

### CHAPTER II.

It is therefore pertinent to consider very generally the structure of the formation underlying the Everglades; the present character of the soil as it now exists in a submerged condition, and incidentally its favorably changed condition when drained and surface dried; the climate with respect to its temperature and the permanency of the same and its humidity; the plant growth of the Everglades and of similar adjacent lands, as affording inferences for the successful growth of like vegetation on the reclaimed areas; the fertility of the lands when drained; the transportation facilities after the reclamation is accomplished; the expense of the drainage operations; and finally whether the results to be accomplished are sufficiently great to justify the expense incurred in the reclamation project.

The formation of the lower Florida peninsula, so far as observed, appears to be almost universally a cream colored coralline limestone, slightly changed in some localities, as at Redlands in the rich Homestead country below Miami, by a red clay admixture.

Whether this formation arises from the deposit of limestone particles originally found on the ocean beaches, and blown inland by the winds during past ages, so as to form extensive basins with a ridge of hardened sand hills enclosing them—as has been suggested by some geologists, or is the result of the work of coralline organisms at dif-

ferent levels of submergence during several periods of geological time as suggested by others; is a matter of but little consequence, so far as this present inquiry is concerned.

It is enough to know that the substratum of rock underlying the soil of the Everglades is a coralline limestone; that the basin of the Everglades is fed by the overflow from Lake Okeechobee, by subterranean currents of lime carbonated waters from upper distant levels, and also by the surface rain fall on its own terrace; and that these overflows and subterranean waters not only have carried down large quantities of sand and marl in past ages, and deposited them on the limestone floor of the Everglades, but are doing so at the present time with the finer particles of silt held in suspension.

It may therefore be said, that by whatever means it has occurred, the character of the Everglades soil so far as is derivable from the wearing away and decay of the country rocks, is essentially limestone, modified by sand, clay and marl deposits washed down from above, and by such chemical changes as have taken place during the past ages by reason of the soil saturation with the carbonated waters flowing over its surface.

The inquiry heretofore has been limited to the mineral constituents of the soil. Much the larger portion of the soil content, however, consists of a black mass or mold, locally known as "muck," which covers the silt deposits on the bottom of the Everglades like a blanket, to the depth of six inches near the outer rim of the Everglades and up to ten or more feet in the deeper interior part of the basin. This "muck" deposit arises almost entirely from the decay of aquatic vegetation, chiefly saw grass, splatter docks, pond lilies, rushes and the like during past ages over the Everglade area, together with fallen leaves, twigs, branches and roots of the forest trees common to this latitude, which have become rotted by the lapse of time.

If this soil, composed of the constituent parts above noted, when drained, surface dried and areated possesses resources of fertility under the continuous summer climate Nature has given it, common to other limestone soils of similar appearance in the Mississippi and Yazoo bottom lands,—the richest in the world—there is no need to ask the question whether it will pay to drain it, even though the expense per acre should prove greater than the Government reclamation projects in the arid West.