III.—THE SOIL.*

The depth of soil upon the barrens is nowhere very great. The country rock, a sandstone, outcrops frequently, and the ground is plentifully strewn with boulders, which appear to be fragments of the same rock which have been brought to the surface through the heaving action of the frost. It is rarely possible to dig two feet without encountering rock, and often one finds it much nearer the surface.

The soil is sharply differentiated by color into two layers. The upper, which composes the surface soil, is extremely light, and in texture resembles fine sawdust. Its color when dry is a reddish brown, which changes on wetting to a deep black. It is markedly lacking in plasticity when wetted, a fact which indicates a small content of clay; yet it is not easily reduced to a powder on account of the presence of considerable amounts of undecomposed vegetable matter. When boiled with a 10 per cent solution of caustic potash, it yields an opaque black solution, indicating a large percentage of humus or leaf-mould. It is strongly acid to litmus paper, turning the blue paper red at once when wetted. If ignited, the air-dried surface oil burns slowly without flame, leaving finally a small amount of incombustible ash. This is important as an indication of the damage which a fire may do to the soil. The greatest depth of surface soil hitherto observed is eleven inches.

Subsoil.

The second or subsoil layer is light-colored, but is nevertheless not entirely without humus, as is shown by the potash test. It is derived directly from the underlying rock by the decomposition of the latter; and though it is of comparatively fine texture in its upper layers, it grades off downward into larger and larger sizes, until it is impossible to say just where the 'rotten-stone' ends, and the solid rock begins. The decomposition of the country rock is continually replenishing the subsoil from below, while the penetration of roots into its upper layers, which is easily to be observed, aids its decomposition, and their decay increases its content of humus, thus gradually converting it into surface soil.

There is one soil condition upon the barrens which calls for special comment: the crusty patches, often dozens of square feet in extent. Strictly speaking, this is not a soil condition, but is the result of the growth of certain encrusting lichens. The earth is covered with a brittle crust, which cracks into small clods. Since this lichen is able to exclude all other plants from the area which it occupies, it is an enemy to be reckoned with in cultivating the partridge-berry.

IV.—INSECT AND FUNGOUS ENEMIES.

I desire to reserve detailed report upon this important subject until a later date; it is, however, possible to make a preliminary statement at present.

Insects.

Under existing conditions, the injury inflicted upon the partridge-berry by insects is trifling. Two injurious insects have been seen, one of which attacks the flower, and the other the fruit. The flower worm attacks the blossom while it is still in the bud, and eats out the pistil and stamens, the essential organs of the flower. If this worm occurred in abundance, it would be a serious pest, but not more than a dozen cases were observed during the flowering season. The fruit worm attacks the berry just before picking time, eating out considerable parts of the pulp, and often passing from one berry to another of the same cluster. This worm is somewhat more prevalent than the flower worm, but in most localities does no great damage. It is reported, however, that plants near the lighthouse at Western Bay Head are so in-

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* This description applies to the conditions at Old Perlican where the season's work was carried on. It is probable that there is little if any variation on other barrens except as to the kind of rock.