CULTURAL CHANGES IN SOILS FROM THE STAND-POINT OF EROSION

H. H. Bennett

Cultural operations as they shall be construed in this paper have been directly or indirectly responsible for changes in the soils of the United States to a degree which greatly exceeds the general conception of most of us, soil scientists, as well as others. It must be admitted at the outset that we have not yet accumulated sufficient data of a quantitative nature to present a full and accurate statement of these cultural changes. We have, nevertheless, collected enough data for at least a generalized appraisal of some of these changes and their significance in relation to agricultural practice and crop production.

To avoid any misunderstanding of the measurements, estimates, and interpretations presented in this paper, it will be well at the outset to define the terms "the soil" and "cultural changes" as here used. "The soil" refers to the soil profile or vertical section extending from the surface of the ground down into and including the upper part of the substratum of parent material. Differentiation between the definite natural layers or horizons through this vertical section will be made either by the use of such terms as *topsoil* or *surface soil* *subsurface*, *subsoil*, and *parent material*, or by direct characterization of the materials corresponding to the specific depths limiting the successive natural layers down through the profile.

"Cultural change," as employed here refers to any obvious change, either physical or chemical, in the original or virgin soil condition that may be found to represent, unmistakably, the direct or indirect result of man's activities. Those changes which have come about through the instrumentality of erosion induced by such activities will be emphasized. Chiefly, these consist of bodily removal of part or all of any of the soil layers, and of textural or other alterations in the surface soil by such processes as mixing, overwashing, and elutriation. The principal causes and processes involved in such changes are: (a) Removal or destruction of vegetation by axe, plow, livestock, and fire; (b) disturbance or complete destruction of the normal ground structure or alteration of the texture by culti-

---

*1* Contribution from the Bureau of Chemistry and Soils, U. S. Dept. of Agriculture, Washington, D. C. Also, presented as a part of a symposium on "Cultural Changes in Soils," at the joint meeting of the Society and the American Soil Survey Association, held in Washington, D. C., November 20, 1930. Received for publication December 9, 1930.

*2* In Charge, Soil Erosion and Moisture Conservation Investigations.