The Future of the Soil Survey

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The future of the Soil Survey will be shaped by two sets of factors. First, its growth and importance will depend upon the growth of the whole movement for the application of science to rural land use and rural living. The people of the world cannot be well fed if farmers are confined to the soils of their grandfathers and use only their tools. Yet, the world could feed itself abundantly. We have the soils and the research skill. Of course, it will be an enormous task. But what better one could agricultural scientists set for themselves? To succeed, we shall need to conceive of a world of expanding opportunity, expanding democracy, and expanding science. No one of these—opportunity, democracy, or science—can be had without the others. As scientists and technicians, we must never forget that our technology will be understood and applied effectively only by alert people—people with opportunities for health, for education, for the full use of their labor and genius, and for participation in the affairs that affect them.

As we strive for an ever more effective cultural balance between people and resources, the balance becomes more complex, more delicate. One resource use depends upon another, until we find that our most efficient communities are a mixture of agriculture and industry: water, soils, forests, and minerals are used together. More and more we shall be dealing with principles, programs, and schemes for combined resource use. The control of water on the land, and its use for power and in industry, will become increasingly important. Thus, abundant water will give new areas competitive advantages over older ones as we learn how to handle the new soils.

If we proceed effectively along these lines, one may assert that great expansion of the Soil Survey is inevitable.

Secondly, its future will depend upon the scientists carrying on the work. They could become reasonably satisfied with things as they are. The Soil Survey has come a long way in 50 years. The demands of skill and knowledge on the part of a Soil Survey project leader to produce an acceptable soil map and report are already considerable. They have increased a lot since 1930 and are still increasing. But to meet the problem with full use of our available knowledge, skill is needed.

Every soil survey area presents a challenge to the scientist. An attempt merely to map a few odd or less standard soil types and phases, even if meticulously, is inadequate. Soils are not so easily visualized. The relationships between each soil and its neighbors, and between it and the factors of its environment must be sought out and clarified. All likely potentials for use must be explored and definitely arrived at in quantitative terms. This means existing data, and resourcefulness in capturing the essentials in the land-use experience laid out before the scientist. For new or poorly developed areas, potentialities must be suggested from experience on similar soils elsewhere. Thus, a soil scientist must be at least what of an internationalist to get on with his work. Final results must be presented in terms of systems, as well as in those of single crop practices, with full account of the many factors that control such systems. In short, a good modern soil scientist comes only from an exhaustive research undertaking, and his work is both intensely thorough and broad in scope.

PROBLEMS OF THE SOIL SURVEY

The primary problem of the Soil Survey is to make accurate predictions of the outcome of using any specific area of land in one or more particular ways: sometimes the predictions are turned around: here are areas of land that will behave in specific ways under specified management and treatment. Such predictions require an understanding of the soils of the area and their behavior under several alternative treatments, along with some objective means for their accurate identification. Thus, both classification and mapping are essential to the purpose.

Since predictions are needed at several levels of generalizations—fields, farms, communities, and regions—several levels of categorical and cartographic representations are required. Basically, and most important, is the

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1 Address before the Soil Science Society of America, Milwaukee, Wis., October 1949, on the occasion of the 50th Anniversary of the United States Soil Survey.
2 Chief, Division of Soil Survey, Plant Industry Station, U. S. Dept. of Agriculture, Beltsville, Md.
3 This statement needs some explaining, perhaps. During this same period, say 1935–1945, the Soil Survey was subjected to considerable criticism. Some was fair, and much of it was helpful. Many soil scientists became nearly discouraged, however, and their criticism was not always born of special interests with the needs for balanced and sustained systems of productive farm management. Mainly, however, it was due to part-time duties, and more to part-time duties, than to any intrinsic weakness of the concept. It was not until the work became full-time, and the need for the Service to function as a coordinated national activity, that the Service was able to function as a national agency.