BURIUM OF SOILS; STUDIES IN SOIL OXIDATION; CHEMICAL NATURE OF SOIL ORGANIC MATTER

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G.H. FAILYER & OSWARD SCHREINER & M.X. SULLIVAN

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U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS—BULLETIN NO. 72.
MILTON WHITNEY, Chief.

BARIUM IN SOILS.

BY

G. H. FAILYER.

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1910.

BUREAU OF SOILS.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., May 10, 1910.

SIR: I have the honor to transmit herewith the manuscript of an article on Barium in Soils, by G. H. Failyer, of this Bureau, and to recommend that it be published as Bulletin No. 72 of the Bureau of Soils.

Very respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

PREFACE.

There has been a marked tendency in the past to confine chemical investigation of the mineral constituents of the soil to those which are popularly recognized as of importance in fertilizer practice. It is coming to be recognized, however, that many elements other than those in the conventional essential plant foods are very widely if not universally distributed in the rocks, the soils, and the plants, and that it is of importance, both theoretically and practically, to trace the relationships between these substances, as shown by the passage of the elements from the rock to the plant, through the soil. Recently a very strong plea for more thorough examinations and complete analyses of rocks has been made from the laboratories of the United States Geological Survey, and a no less strong argument can be made in the case of soils and plants.

It no longer suffices to consider the soil merely as the source of a few mineral elements, needed in plant metabolism. We now know that the presence of a small amount of arsenic in certain animal organisms is essential to their proper functioning, and we also know that arsenic in small quantities is very widely distributed; yet no one thinks of arsenic as an animal food. Similarly we are learning that small amounts of various organic and inorganic substances can, and do, produce marked physiological changes in plants, and that some of these are to be found widely distributed in soils. That we yet know but little as to their theoretical importance and nothing as to their practical importance is no argument that they do not possess the latter.

One of the important lines of work which this Bureau now has in hand is a study of the distribution of the mineral elements (including the so-called rarer elements) and the minerals in the soils of the United States, and one publication (Bul. No. 54, Bureau of Soils) has already been issued. The work reported in the present bulletin, while considered primarily as a further contribution to knowledge in this field of the Bureau's investigations, has had an impetus from

and been guided in part by the interest of the Bureau of Plant Industry in the possibility that the presence of barium in the soils of certain regions might cause some kinds of plants characteristic of these regions to prove poisonous to stock. But the more important result of the investigation is the recognition of the wide distribution of barium throughout the soils of the United States, and the probability that it may be encountered in plants grown in any part of the country.

FRANK K. CAMERON,
In Charge Physical and Chemical Investigations.

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