that leads to infertility, *i.e.*, if the rate of removal exceeds that of replenishment, determined over a sufficiently long period of time to take account of the effect of different kinds of cropping and soil management, nevertheless, it also plays a very important beneficial rôle in crop production. It appears as a unique relationship of physiological requirement and soil adjustment.

It appears that these considerations briefly alluded to in this paper are some of the more important factors that bear on the much discussed problem of how to give interpretation in terms of crop production to the chemical analyses of soils. It introduces a new formula—the rate of the temporary depletion of some of the salt elements, as an expression of soil fertility. It is a formula that includes the factor of supply, or rate thereof, whose importance has been generally emphasized by soil investigators since the time of Liebig, and two new factors, that of physiological requirement and soil adjustment.

That the temporary depletion of certain available nutritive elements in the soil by plants—the very process that contains the essence of the conditions that makes for infertility and soil exhaustion—is also one of nature's most important agencies and conditions essential for large crop production, is the conclusion of this paper. The rhythmic cycle of changes in the soil to which plant processes have become adapted is characterized by seasonal accumulations and production of available plant foods. This is a condition necessary for the growth of plants, but as some of these elements become depleted, or nigh so, by plants at certain phases of their growth, the absence of these elements in turn becomes a condition decidedly beneficial to growth. It appears that the failure to recognize and evaluate the physiological significance of these changes, constituted one of the chief obstacles that beclouded an understanding of the relationship of the available nutrients in the soil to crop production.

In a paper to appear elsewhere, the writer will treat the data obtained by Stewart in the light of this formula and discuss its application in the interpretation of chemical analyses of soils in terms of crop-production.

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THE AMERICAN MATHEMATICAL SOCIETY

THE two hundred and thirty-fourth regular meeting of the American Mathematical Society was held at Columbia University, on Saturday, March 1, 1924. This meeting was preceded, on the evening of February 29, by the society's first Josiah Willard Gibbs Lecture, delivered by Professor M. E. Pupin in the Engineering Societies' Building, New York City, before a large and distinguished audience, including, besides members of the society, a number of physicists, chemists and engineers who were present by invitation. Professor Pupin's lecture, entitled "Coordination," dealt in part with certain aspects of Gibbs's work.

At the meeting of the society the attendance included 47 members. The secretary announced the election of five persons to membership.

It was decided to hold a colloquium at Cornell University in the summer of 1925. No summer meeting will be held in 1924.

The following papers were read:

The outer multiplication of integral forms: F. D. MURNAGHAN.

A modification of tensor analysis: G. Y. RAINICH.

On the electromagnetic field in general relativity theory: G. Y. RAINICH.

The remainder in Charlier's integral formulas: R. E. GILMAN.

An existence theorem: EINAR HILLE.

Proof of the instability of the motions of asteroids whose periods are one half that of Jupiter: E. W. BROWN.

Thick rectangular plates: C. A. GARABEDIAN.

Generalization of certain theorems of Bohl: F. H. MURRAY.

Functionals of closed plane curves, invariant under one-parameter groups of transformations of the plane, and generalizations: A. D. MICHAL.

An unusual type of expansion problem: M. H. STONE.

On the order of an analytic function at a singular point: M. H. STONE.

Theorems concerning the division of a plane by continua: J. R. KLINE.

Geometries of paths for which the equations of the paths admit a quadratic first integral: L. P. EISENHART.

On the complete independence of the postulates for betweenness: W. E. VAN DE WALLE.

Equivalent rational substitutions: J. F. RITT.

New proofs of two well known theorems on quadratic forms: J. F. RITT.

A characterization of a bounded continuum which forms the common boundary of two domains in the plane: R. L. MOORE.

On the relation of a bounded continuum to its complement in the plane: R. L. MOORE.

Note on Brouwer's fixed point theorem: J. W. ALEXANDER.

On the dependence of the curvature upon the electromagnetic field: G. Y. RAINICH.

R. G. D. RICHARDSON,
Secretary