SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, NOVEMBER 6, 1908

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THEORIES OF MANURE AND FERTILIZER ACTION[1]

IT is to Liebig that we owe the first general theory of the nutrition of the plant and the function of fertilizers: although Liebig himself did not add anything to the knowledge of the process of carbon assimilation which had been acquired by Priestley, Senebier and others, nor to the study of the nitrogen and ash constituents which had been begun by de Saussure, he yet drew up from these facts a coherent theory of the course of nutrition and put it before the world with such vividness that it forthwith took its place in the general body of accepted scientific opinion. Liebig argued that since the ash constituents alone are drawn from the soil, it is only necessary, in order to ensure the complete nutrition of the plant, that there shall be no deficiency in the inorganic materials which are left behind when the plant is burnt. According to Liebig the function of the fertilizer is to supply to the soil the materials removed therefrom by the crop, and the fertilizer required can be ascertained beforehand by the analysis of a similar crop, so that the soil can be supplied with the exact amounts of potash, soda, magnesia, lime, phosphoric acid, etc., which would be removed by a normal yield of that particular crop. Neglecting Liebig's misconception of the source of the plant's nitrogen and the long controversy which arose as to the necessity of its artificial supply, we can restate the theory as assuming that

[1] A lecture given at the Graduate School of Agriculture, Cornell University, July, 1908.