THE nitrogen of the various amino acids tested in a previous study showed varying degrees of retention by the soil. The nitrogen of glutamic acid was very weakly retained and that of glycine somewhat more strongly, while that of arginine was very strongly retained. These variations may have originated in different adsorption isotherms for the individual amino acids themselves, or may have arisen from the varying rates at which ammonia or some other strongly retainable nitrogenous compound was split off even during the short period of percolation. In case the amino acids were deaminized the agency might have been either microorganisms, catalysts, or both. The present study was undertaken to investigate and answer these questions.

Since amino acids are the “building stones” of the proteins and, in consequence, are intermediate products in the breakdown of these compounds on the way to form the inorganic ammonium and nitrate forms of nitrogen in the soil, a full knowledge of the processes involved in organic matter decomposition in soils requires a detailed understanding of the interaction of amino acids with the soil. Should the addition of amino acids to soils prove desirable, these results should prove useful in deciding how to add them.

RETENTION AS INDICATED BY PLANT CULTURES

The retention of the nitrogen of amino acids was determined by the technic of Conrad and Adams (5). By this method 4-inch clay pots previously coated with asphaltum paint were used. With a square of waxed paper over the drainage hole to hold back the dry soil, each pot was charged with 400 grams of Yolo fine sandy loam—an lot deficient in nitrogen under greenhouse conditions. This soil is, in general, neutral to slightly basic containing colloids which are predominantly montmorillonitic and with relatively high cation-exchange capacity. Magnesium is the chief replaceable cation. Four pots were stacked to make a column so that the drainage from one pot dripped into the pot below. Four columns were provided for each treatment employed. The volume of solution for each column was sufficient to wet all of the soil in the column with a slight excess. The solutions for columns receiving nitrogen contained approximately 10 m.at. nitrogen per column and were added in installments to the top pots of the respective columns. The soil designated as “preheated” had been placed in crocks, moistened with distilled water, heated for approximately 48 hours at about 85° C, and then dried. This lot was used to charge all pots in which the soil is designated “preheated”.

The columns subjected to percolation for 16 hours received the nutrient solutions in four installments 4 hours apart. For those subjected to percolation for

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3Figures in parenthesis refer to “Literature Cited”, p. 58.

4As used in this paper m.at. equals milligram atom.