Nitrogen-fixing organisms are present in most normal soils, but their activities in the soil are dependent on the available energy-furnishing material. It seems quite logical that in soil the only source of energy-furnishing material must be the decomposition products of plant residues, such as stubble, roots, leaves, etc., all of which contain a high percentage of cellulose. These cellulose materials are not directly attacked and decomposed by the nitrogen-fixing organisms.

McBeth (6) working with cellulose in the form of ground filter paper and using *Bac. rossica*, *Bac. fini*, and *Bac. flavigana* for breaking down the cellulose and with *Azotobacter chroococcum* as the nitrogen-fixing agent reported that the latter utilized the decomposition products of the cellulose material as sources of energy for nitrogen fixation.

Löhnis and Green (5) reported that the nitrogen fixed by *A. chroococcum* in 100 cc of mannite media was doubled when fresh straw was added. Hunter (2) found no increase in the amounts of nitrogen fixed when straw was added to the media. Dvorak (1) and Hutchinson (3) have shown that plant residues are utilized by Azotobacter for nitrogen fixation.

In the present investigation it was intended to observe the utilization of cellulose decomposition products by Azotobacter and *B. amylobacter* for nitrogen fixation.

**METHODS**

The Kjeldahl method was employed for total nitrogen determinations. Coarsely ground filter paper and straw were used as cellulose materials.

Two soils, a loam and a sand, and Ashby's nitrogen-free media were employed in these experiments.

In experiment I, to 100-gram portions of a loam soil in 250-cc Erlenmeyer flasks was added 1 gram of coarsely ground filter paper.