In another experiment [2] soil tests showed that Norfolk loamy fine sand fixed a very large amount of inorganic phosphorus, which was partly made available later. This may explain why corn shows phosphorus deficiency symptoms early in the spring and then later recovers. Because this soil has the capacity to fix large amounts of phosphorus, most crops need more phosphorus than nitrogen or potassium fertilizers.

In addition to the above mentioned soil-plant-yield correlation in 1949 and 1950, the rotation experiment was sampled approximately every 2 years for soil-yield correlations. Data from the 1957 soil samples are recorded in Table 30. The pH, calcium, potassium, magnesium and phosphorus were generally lower on the continuous peanut plots than on the continuous corn plots. Since both crops received the same amount of fertilizer, 500 pounds per acre of 2-10-8 fertilizer annually, it is evident that peanuts deplete the soil of fertility faster than corn. The 2-year rotation plots, while not as low in fertility as the continuous peanut plots, were significantly lower than the continuous corn plots. The quantity of phosphorus was about the same in the 3-year rotation plots as in the continuous corn plots. All the other nutrients were slightly lower in the 3-year rotation plots than in the continuous corn plots, but higher than in the 2-year rotation plots.

These results indicate that continuous corn well fertilized did not deplete the soil any more than a 3-year rotation. This explains why the yield of corn continued to be high, even after 10 years of continuous cropping to corn (Table 1). Since corn yields for the rotations continued to be slightly higher than for continuous corn treatments, even though chemical analyses of soil showed fertility in general somewhat lower on the rotation than continuous corn treatment, possibly some other undetermined factor—microbiological or chemical—was limiting yields when corn was grown continuously.

Soil samples were taken from 4 replications of the fertilizer experiment for chemical analysis, usually every 2 years as in the rotation experiment. Results from 1955 through 1957 are given in Table 31. Data from the surface samples show that there was an increase in phosphate, potash and calcium in the soil where these elements were applied, but a decrease in magnesium. Lime did not increase the calcium level as much as might have been expected possibly because of the coarseness of the limestone. From 1947 to 1955 when no lime was applied

[2] Pritchett, W. L. Unpublished data. Soils Dept., Univ. of Fla. 1949.