The results of a recent study by J. K. Wilson (1) suggest the existence of a close relationship between the genetic constitution of leguminous plants and their ability to function as hosts for few or many strains of Rhizobium. Wilson noted that those species of legumes which accepted many strains of Rhizobium were those which are self-sterile to a considerable degree, and which reproduce largely through cross-pollination. At the opposite extreme he observed that those species of legumes which accepted none or only a few strains of Rhizobium were those which reproduce wholly or largely through self-pollination. These observations lead to the hypothesis that those species of legumes which have descended to their present state through an unknown large number and breadth of cross-pollinations among their forbears have acquired thereby the heterogeneity of constitution conducive to symbiosis with many and varied strains of Rhizobium. At the other extreme are those species which have descended in a relatively pure state by means of successive self-pollinations among their forbears, thereby failing to acquire the factors which favor symbiosis with many strains of Rhizobium.

Whatever may be the mechanism by which differences developed in the evolution of the legumes, it is true that genetic relationships represent an aspect of the phenomenon of legume-Rhizobium symbiosis which has received little or no attention in previous research. Investigations in this field should prove to be fruitful, both from the academic and the practical point of view.

A convenient approach to the study of the heritability of factors which favor symbiosis with various strains of Rhizobium is afforded by those legumes which propagate vegetatively as well as sexually. It should be possible to utilize cuttings to test for acceptance of a large number of strains of bacteria by a single plant, since the number of tests is limited only by the number of cuttings which may be successfully rooted. By such an expedient a large number of progeny tests may be made upon a single plant. Perhaps the most common example of this plant is wild white clover, Trifolium repens, which produces numerous stolons. Cuttings taken from such stolons and imbedded in sand soon produce roots which readily nodulated in the presence of an appropriate strain of Rhizobium. The stolons, however, are not always free of the rhizobia inhabited the soil and the roots of the plant. Contaminations of this kind may be a source of confusion in tests of the presence or absence of the factors for symbiosis in the genetic constitution of the plant. It is, therefore, necessary to discover methods for obtaining cuttings which do not present this disadvantage.

**Experimental**

Attempts were first made to remove rhizobia from cuttings of Trifolium repens by disinfection with solutions of calcium hypochlorite which have been found useful in the disinfection of seeds (2). The procedure was as follows:

Stolons were obtained from plants growing in the field. They were placed in water where they remained for a short time previous to treatment in the laboratory. Each cutting was trimmed so that it contained two to three nodes, and all roots and leaves were removed. The cuttings were then placed in a series of flasks to which were added solutions of calcium hypochlorite in quantities several times the volume of the cuttings. The concentrations of these solutions ranged from 50 to 6000 p.p.m. active chlorine, and the time of treatment ranged from ten minutes to one hour. The concentrations of the solutions were previously fixed by appropriate dilution of portions of a concentrated solution which had been standardized by titrating an aliquot with standard sodium thiosulfate in the presence of sulfuric acid and potassium iodide. At fixed intervals of time the cuttings were removed from each solution.