Interest has been manifested from time to time in the number of legume bacteria that a soil will maintain. Such interest was probably stimulated by the practical problem of soil inoculation for legumes. Several attempts have been made to determine the number of such organisms in 1 gram of soil. These attempts have centered around the development of a specific medium that would permit the growth of the legume bacteria and exclude all others. This method of procedure has been disappointing because bacteria other than those of the leguminous type have also developed on the medium. If such a medium were used successfully in developing and determining only the colonies of the legume organism it would not tell whether the organisms belonged to the Medicago, Trifolium, or some other group. It is doubtful if such procedure will ever give the desired information for it is fairly well established that the reaction of the medium will have a dominating influence upon the group of legume bacteria that will develop.

Recently the writer has presented data to show that soils may be deficient in legume bacteria, even though the soil had grown the host plant (Vicia vellosa) consecutively for nine years. Such data were obtained by counting the nodules on plant roots that had grown in the soil in comparison with those that had grown on roots in the same soil when the proper legume bacteria naturally present were supplemented with an artificial culture. Also in certain cases data were obtained which indicated that the bacteria for Trifolium and Medicago plants had nearly disappeared from the soil.

With these facts in mind, experiments were conducted to deter-