The determination of the base exchange capacities or the total amount of bases capable of being held by the acid complexes present in certain soil types of Illinois was undertaken in order to determine whether the measurement of the base exchange capacity could be used in soil type investigations as a laboratory tool for type or horizon studies.

This paper will attempt to show that the amount of the acid complexes present varies from horizon to horizon and is related to the maturity of the soil and to the conditions under which the soil forming processes took place.

This study is an outgrowth of the cooperative soil profile studies carried on by the Illinois State Geological Survey and the Soil Survey.

In a recent paper, "The Soil Reaction Profile" by Norton and Bray this same problem from the standpoint of the pH curve of the soil profile is presented and significant differences were found between mature and immature soils and also between soils formed in the same region of the same material but differing in topography.

The pH curve of the soil profile, however, shows no sharp breaks between horizons. It varies with depth and depends upon the amount and type of leaching as modified by plant growth and decomposition of the basic minerals.

The soil types used are described in various Illinois Soil Reports while the gumbotil profiles are described by Norton and Smith in the Journal of the American Society of Agronomy, Volume 19, page 324 (1927).

The method used for determining base exchange capacity and total replaceable bases will be taken up in detail in a later paper.

The nature of the complexes taking part in the base exchange reaction has an important bearing on soil formation processes. Be-