THE problem of supplying crops with phosphate is very important because most soils, especially those of the humid South, are deficient in available phosphate. Furthermore, phosphates added in fertilizers are soon made unavailable by being fixed into insoluble forms by components in the colloidal fraction of the soil (5), and it is generally believed that these fixed phosphates accumulate in the soil profile.

Several investigators (2, 3, 4, 6, 7, 8) have reported that slight amounts of phosphates have moved into the lower layers of the soil, but they believed this movement to be chiefly mechanical. Obviously, the greatest residual accumulation should then be in the upper soil layers. Undoubtedly, this accumulation should be of considerable extent in heavily phosphated fields in climates where winter erosion is slight, or where the vegetative cover is heavy throughout the year; but in the light-textured, clean-cultivated soils of the humid South, where erosion is great throughout the year, the accumulation is likely hindered. Where erosion removes the topsoil to plow depth every few years there can be no accumulation of phosphate. Where the land lies nearly flat, erosion does not remove a great volume of soil, and only muddy water, colloidal suspension, runs along the furrows in the middles and away. Since this type of erosion does not deface the appearance of the field, it is generally not considered extremely important to the farmer. Almost no data exist to indicate what the phosphate losses are in the small amount of colloidal material that is lost from soils that are considered not to be seriously eroded.

An opportunity to study the movement of residual phosphate in a loamy sand (Norfolk) that had received various kinds and amounts