Soil surveyors, in attempting to increase the value of their work, have been turning their attention more to the practical side of soil science. An expression of this fact was the establishment of a Committee on Edaphic Relationships. In furtherance of this spirit we are presenting the results of some field studies made on the distribution and penetration of roots with relation to soil horizons.

Several investigators have made rather detailed studies of the root development of various plants, but apparently none have made more than extremely general descriptions of the soils in which the roots were found. In only one case have we found a definite soil horizon recognized and described in relation to root penetration and distribution. Weaver (16) found in Colorado that wheat and other small-grain roots did not penetrate a horizon of hardpan, but that perennial grasses, such as buffalo grass and bluestem, did penetrate below the hardpan. His description indicates that the material was a hardpan cemented by lime accumulation rather than a true claypan. Weaver (15) also found that roots do not penetrate dry soil and that they penetrate more deeply in soils having friable loamy or silty subsoils.

Depth of penetration of native grass roots has been reported to range from 9 inches in New Jersey to 7 feet in Nebraska (15). Exceptional depths of root penetration have also been noted in sandy soils (15).

All previous methods of root study have been very slow and laborious and have therefore discouraged root studies except in the very friable soils. The method of counting roots on the exposed ends of cores is simple and requires very little time or equipment. Doubtless, the exact number of roots per square inch of soil at a given depth cannot be determined by counting but at least a relative figure for the various soil horizons may be obtained.

All these investigators have used very slow and extremely laborious methods of root study. Weaver (15), who has done more work on root investigation than any one else, digs a deep trench and, using a light pick and ice pick removes the soil from around roots and draws diagrams showing location of the roots in the soil. Eyck Ten (14), one of the pioneers in this field, digs out prisms of soil and washes the soil away from the roots with a water jet.