

THE ORIGIN OF FIELDSTONES IN  
NORTHEASTERN PENNSYLVANIA

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An Abstract of a Thesis  
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Master of Arts

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by  
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## ABSTRACT

There is no easy explanation of the occurrence of stones on the surface of soils. Fieldstone origins perhaps are as complex as the origin of soils on which they lie. The intent of this study is to attempt to describe some of the factors which surround the origin of fieldstone concentrations on some soils in northeastern Pennsylvania. The purpose of this investigation is to examine the vertical distribution of stones in soils and to appraise surface stone concentrations and the vertical distributions as they may be affected by four factors:

1) frost action; 2) soil animals; 3) erosion; and 4) moisture content.

Square meter pits were excavated in ten locations by successively removing layers 15 cm. (6 inches) in thickness to a depth of approximately 76 cm. (30 inches). Each 15 cm. layer for each pit was passed through a square mesh screen with openings of 1.27 cm. (0.5 inches). The stone portion retained for each layer was washed and then passed through a series of seven additional square mesh sieves of increasing size. Eight stone sizes ranging from 13 mm. (0.5 inches) to greater than 101 mm. (4.0 inches) were weighed to obtain a breakdown of the percentage by weight for each stone size of the total weight in each 15 cm. layer. Soil samples were taken for each 15 cm. layer in each pit and laboratory analysis consisted of two procedures:

1) determination of the grain size of the less than 2.0 mm. soil fraction; and 2) determination of soil pH of the material passing the number 10 (2.0 mm.) ASTM sieve.

It was hypothesized that a pattern of vertical stone distributions and surface stone occurrences would evolve as dictated by the dominant soil activity inherent to each pit location and soil type. The degree of influence of frost action, animal activity, erosion, and moisture content was determined by examining soil properties generated in the field and laboratory. The vertical stone distributions and stone-size breakdowns were weighed against the consensus determination of what soil activity was essentially providing the greatest influence on stone distributions and fieldstone origins for each sample location.

The conclusions of this investigation are four-fold: 1) frost action is not producing surface concentrations of fieldstones in the soils sampled at the rate, intensity, or frequency as previously supposed; 2) soil animals, namely the common earthworm, are not producing stone-free surface horizons in the soils sampled, as had been expected; 3) erosion is not producing surface concentrations in all locations on cultivated soils; however, where concentrations exist it is because of the downward accumulation of stones by erosion; and 4) saturation is contributing to subsurface concentrations in the more poorly drained soils sampled.