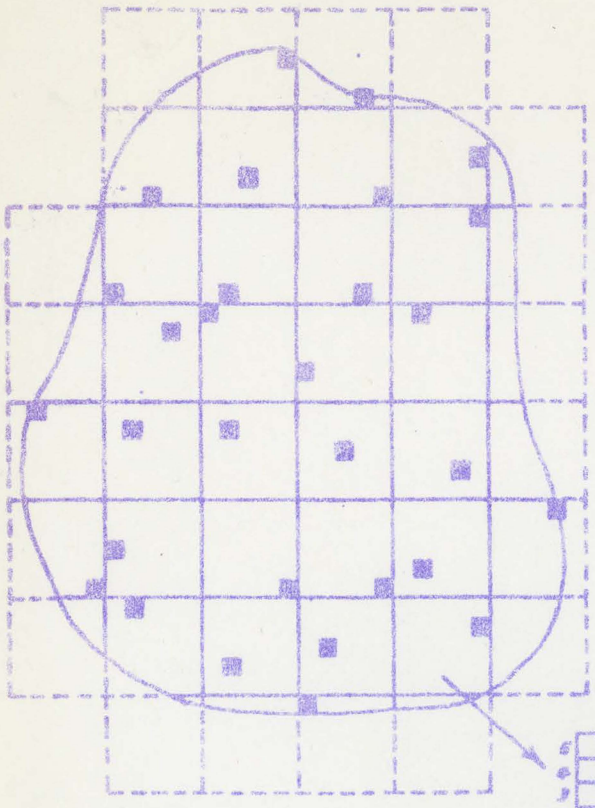
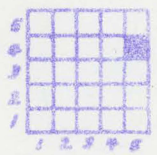
A Maximum Dispersion Random Sample



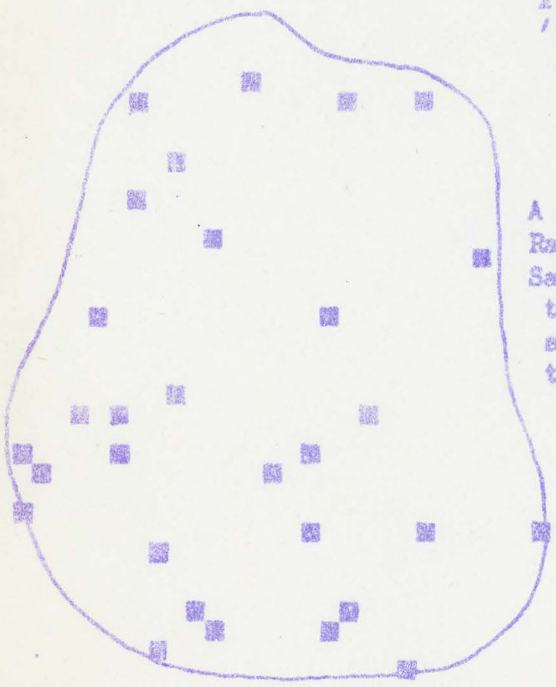
Rules for Selection of Sampling Units

1. Design a subframe of a size equal to the sampling interval with dimensions as nearly equal as possible.
2. Superimpose a frame with units of a size optimal for what is being sampled and partition these into the requesite subframes. Where the subframes are of unequal dimensions, they may be staggared so that each dimension of the whole frame is proportionately sampled.
3. Number either the intervals of the two axes or all units in the subframes, and select a unit to be sampled in each subframe by reference to a random numbers table. In the case of the axes method, pairs of numbers would be taken from the table, the first of the pair referring to one axis and the second referring to the other.



Subframe

4. Regarding subframes falling partly inside and outside the area being sampled, only those which contain a half-unit or more would be considered. If the selected unit falls at least one-half inside the boundaries of the area, it would be sampled; if outside, it would not.



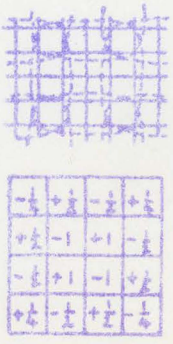
A Simple Random Sample, with the same sampling fraction as above

Estimation of Variance of the Mean Estimate (adapted from a 2-dimensional systematic sampling variance estimate given by Yates 1960:231):

Procedure:

1. Select a comparatively small grid size which will include a comparatively small number of subframes; Yates suggests 16.
2. Arrange grids so that marginal subframes overlapp.
3. Proceed using the formula below, multiplying each value by its coefficient.

$$v = \frac{\Sigma(d^2)}{n'[\Sigma(coef^2)]}$$

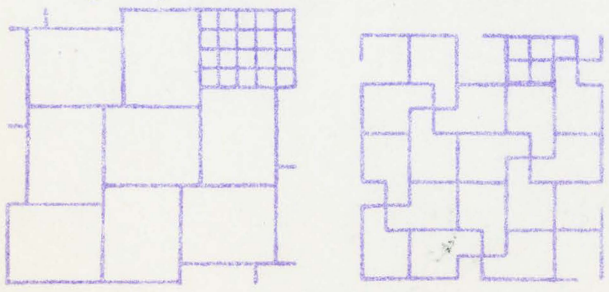


d^2 = squared difference between [redacted] values. *in one grid*

n' = number of differences, in [redacted] *the universe*

coef = coefficients given to the left. The sum of squares here is 6.25.

Examples of Subframe Designs: sampling intervals of 20 and 5



Ec. 3.1.1.8