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Bengal Immunity Research Laboratory,
Barnagore, Calcutta,
9-9-38.

U. P. Basu.
H. Goswami.

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A Note on Grid Sampling

In field surveys, the sampling units or grids usually have definite spatial connexions. In a purely random field such connexions are absent, and the sampling variance (ignoring boundary conditions) conforms to the binomial distribution. In other cases, analysis of data collected in the course of certain recent crop surveys (again ignoring boundary conditions) shows a more generalized type of distribution, in which the variance is inversely proportional to a constant power of the size of the sampling unit. This result enables the field characteristics being defined with the help of two parameters.

The efficiency of a sampling programme depends on two factors, namely, the magnitude of the sampling error and the total cost or time necessary for the sampling work. The result given in the previous paragraph determines the sampling error. The second factor can be studied by constructing suitable cost functions which depend on the size of the sampling units as well as on their density. The efficiency of sampling can then be suitably defined in terms of the variance function and the cost function. Maximizing this expression in the usual way, it is finally possible to determine the most efficient sampling programme for a given expenditure for different types of field.

Statistical Laboratory,
Presidency College, Calcutta.
17-9-38.

P. C. Mahalanobis

Catalytic Reduction of Carbon Monoxide

Carbon monoxide reduced by hydrogen at atmospheric pressure in presence of nickel catalyst is known to yield only saturated hydro-carbons. An attempt to prepare unsaturated hydrocarbon has been successful by use of nickel-copper catalyst. Thus with a promoted nickel-copper catalyst reduced at 275°C, a gas mixture of the following composition has been obtained on carrying out the reaction at 248°C. CO_2 0.3%; unsaturated hydro-carbon, 3.7% Carbon monoxide 23.3%; Hydrogen 71.0%; Methane 1.7%.