

ESTIMATION OF INTRINSIC RATE OF GROWTH OF POPULATION FOR INDIA 1901-1961

O. P. VIG*

LOTKA has defined stable population as a population closed to migration and influenced by relatively constant age-schedules of fertility and mortality. He maintains that such a population will attain, after a number of years, a fixed rate of growth and a fixed age-distribution.

Improvement in public health during the last few decades, has caused a marked decline in mortality in many under-developed countries. A population with a constant fertility and smoothly declining mortality may be termed "quasi-stable" population, in which the age distribution at any moment is nearly identical with the stable population having constant fertility and current mortality schedules. This is the case in most of the under-developed countries at the present time.

The purpose of this paper is to utilize the properties of 'stable' and 'quasi-stable' populations and to determine the values of the vital rates, based on the data available in the decennial census for India. The arguments and the computations that follow restrict to females only.

For the human population, Lotka¹ has shown that with constant age-schedules for mortality and fertility, the population will ultimately have a constant rate of growth and a fixed age-distribution. The stable age-distribution which must ultimately become established in a population is given by the following three systems of equations:—

$$C(x) = b^{-rx} e^{px} \quad \dots \quad \dots \quad \dots \quad (1)$$

$$\frac{1}{b} = \int_0^w e^{-rx} p(x) dx \quad \dots \quad \dots \quad \dots \quad (2)$$

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