

1st December, 1952.

Dear Mr Acharya,

You were quite right to write to me about your difficulty in respect to the relationship between infantile death rate and birth rate to which I drew attention. You are also right that this relationship, although established on ample statistical evidence and by more than one authority, is usually ignored in textbooks on population.

The first substantial work that I know of dealing with the subject was by Stevenson, at that time General Medical Officer of the Registry Office in London, using the material of the 1911 census. Stevenson was engaged in a general study of the causes of infantile mortality, and was of course, familiar with the view widely taken for granted, that the association of higher infantile mortality with large families was due <sup>simply</sup> to overcrowding, poverty and neglect occasioned by families, beyond the capacity of their parents, with consequent <sup>diseases</sup> disease and death. That this is sometimes true in individual cases cannot be doubted, but it does not follow that this is a true explanation of the statistical relationship between birth and death rates.

In the publication I refer to, of which I have not

the Stationery Office reference, Stevenson made the comparison of death rates by order of birth and showed that the difference in infantile mortality between large and small families was greatest for the first child and next greatest for the second, declining throughout the family. As infantile mortality is defined as death within a year of birth, those first children of large families who suffer these causes of mortality could scarcely have done so by reason of their later brothers and sisters who did not, at that time, exist. In fact, Stevenson demonstrated with quite ample material, that whatever may be the effect of large families upon the infantile death rate, an infantile death is an important cause in promoting a large family.

To take a second example, Dr. A. Bradford Hill, formerly President of the Royal Statistical Society once made an early study using Swedish data back to about 1750 and British data back to the first census in 1801, to see if any statistical measure could be made of the so-called "pressure of population", for it was, and may still be widely believed that in western societies additional deaths, by making life in some ways easier for the survivors e.g. unoccupied houses, inherited property and so on, promoted increased reproduction. Hill therefore examined whether there was a <sup>passing</sup> ~~linking~~ correlation or association between the deaths recorded in various years and the births of subsequent years. I remember he worked

the material rather thoroughly from several different points of view and his data pointed unmistakably to the facts that in England and Sweden over these periods there was no measurable pressure of population in this sense, save that in respect of deaths under five years of age there was a measurable and significant tendency to compensation by births in the following few years.

A number of clinical studies have been made on hereditary diseases liable to result in a greatly increased tendency to miscarriages and still-births. Such diseases, if simply inherited, allow a comparison to be made between women liable to such misfortunes and their normal sisters, a comparison which is well controlled in respect of social class and locality. The first of these enquiries that I know of was made by R. R. Race, then working with me at the Galton Laboratory on the hereditary defect acholuric jaundice. He found that women who inherited acholuric jaundice lost a large proportion of their children before or at birth, but that in his records, they had a slightly larger number of living children than their normal sisters.

I understand, but have not seen the results, that Dr. Bentley Glass of Baltimore has recently made a similar comparison to test this very point, using cases of women immunised against the Rhesus gene  $\rho$  and in consequence losing children before or after birth through haemolytic disease. Dr. Glass has confirmed a situation exactly similar to that

found by Race, namely a slight over-compensation of the severe mortality to which these families are exposed.

In the light of these examples, perhaps you will agree that the fact that all works on population which you could consult were completely silent over the question was perhaps due to the fact that the compilers of these works were not adequately informed as to what had been done either by statisticians or by clinicians to make the matter clear. I am rather surprised that the Indian Statistical Institute could not help you, as it was probably through them that my opinions became known to the Famine Enquiry Commission. It must be remembered that general books on population, like that of Carr Saunders are very much compilations of second-hand material which their authors find ready made by people who are not particularly conversant with such original work as has been done on the subject.

Of course, I do not doubt that the Indian birth rate is a very real menace to any prospect of raising the standard of living of the Indian people. In fact, I feel sure that from now onwards there will be a famine somewhere in your great country every year.

Sincerely yours,