

RICE DIETS AND FERTILITY RATE

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TABLE I

Birth-rate per mille

	1946	1947	1948	1949
Ajmere-Merwara	.. 33.4	33.9	25.7	26.6
Assam	.. 18.9	15.6	15.3	15.1
Bihar	.. 23.0	18.6	18.0	17.7
Bombay	.. 33.8	33.6	32.5	33.6
Coorg	.. 18.8	17.8	15.1	17.6
Delhi	.. 35.5	29.8	25.6	31.2
Madhya Pradesh	.. 37.2	34.9	33.2	35.5
Madras	.. 32.1	33.2	30.8	30.9
Orissa	.. 28.5	27.8	27.2	26.6
Punjab (1)	.. 38.3	32.8	35.0	38.4
Uttar Pradesh	.. 25.3	23.3	20.6	22.3
West Bengal	.. 23.8	19.2	20.4	21.1
Indian Union	.. 29.2	26.6	25.2	26.4

THE concentration of a major portion of the world's population in the rice belts of the world has given rise to speculations about a possible correlation between consumption of rice diets and increased human fertility rate. While this association was never scientifically and critically examined, it was allowed to gain ground in lay circles. An additional impetus was given to it by utterances emanating from Japanese sources and reported in the lay Press in India about a year ago; since then, the existence of this association was taken for granted and repeated often. Mention was made in the Press recently about the Government of India seriously thinking of starting investigations to find out the existence or otherwise of an association between rice consumption and fertility. It is but meet that the existing data on the subject, collected at great pains and expense by Governmental agencies, should be pooled and critically assessed, before fresh investigations are undertaken. If the results of such an enquiry should prove inconclusive, the need for fresh investigation would obviously arise. An attempt has, therefore, been made to assess the existing data in India and elsewhere from this particular angle.

Fortunately, figures of birth-rate are available, 'State-wise' ('Province-wise' before the partition of India in 1947), published annually by the Director-General of Health Services, Government of India. It is also fortunate that the Provinces of India, now called the States, fall into certain fairly well-defined divisions so far as the staple article of the diet of the population is concerned. Thus, it is possible to differentiate broadly the rice-eating States from those where the staple article of food is something other than rice, say wheat or millets. Assam, Bengal (after 1947, West Bengal) and Madras are the three principal rice-eating areas of India, while the Punjab, United Provinces and Ajmere-Merwara are predominantly wheat-eating areas. The birth-rates per mille for 12 States of India for the four years, 1946 to 1949—figures for 1949 are the latest available—and the average birth-rate for the entire Indian Union for the same period are given in Table I (*Statistical Appendices to Annual Report of the Director-General of Health Services*² for the years 1948 and 1949, Part I).

It will be seen from Table I that the lowest birth-rates in India are to be found in Coorg

and Assam, both of them being principally rice-eating areas. The figures range from about 15-18 per mille and are well below the average of about 25-29 for the Indian Union. This consistently low figure should give the quietus to the theory that rice diets conduce to increased fertility. Additional data showing lack of correlation between rice consumption and fertility are again available from the same table. The birth-rate for the Punjab, an almost exclusively wheat-eating area, is the highest in India and amounts to 38.4 per mille (1949); rice enters but little into the diet in the Punjab. Again, the birth-rates in the States of Bombay, Madhya Pradesh and Delhi are equally high, all being well over 30 per mille; the staple articles of diet in these regions are millets and wheat. The birth-rate in the Madras State, a predominantly rice-eating area, is no doubt high, being in the neighbourhood of 30 but the fact that it is nearabouts the same or lower than the figures obtaining in areas where rice hardly enters into the diet of the people should provide unequivocal evidence of the lack of any association between rice diets and fertility rate.

Quite apart from the data published by the Director-General, Health Services, Government of India, an examination of the figures given by other demographers point to the same conclusion. Table II gives data of birth-rates for ten Provinces together with figures for all-India for the three decennial periods ending with 1931

(Gyan Chand³). The same figures have also been quoted by Blunt¹ and by Radhakamal Mukerjee.⁴ Unfortunately, the sources from which these figures have been obtained are not mentioned. However, they should prove useful in so far as a comparison could be instituted within the table itself.

TABLE II
Birth-rate per mille

		1901-11	1911-21	1921-31
Assam	..	35.7	32.3	30.3
Bengal	..	37.6	32.8	28.5
Bihar and Orissa	..	41.0	38.8	36.3
Bombay	..	33.4	34.2	35.9
Madhya Pradesh	..	49.6	45.5	43.7
Madras	..	30.8	30.7	34.6
Mysore	..	17.1	19.0	18.9
N.-W. Frontier Province		34.6	32.8	28.0
Uttar Pradesh	..	41.4	42.2	35.1
Punjab	..	41.2	43.8	42.2
All-India	..	38.0	37.0	35.0

The figures in the above table afford incontrovertible evidence for the same lack of association between rice consumption and birth-rate. Madhya Pradesh, Punjab and Uttar Pradesh have a higher birth-rate than the Provinces of Madras and Bengal, principal rice-eating areas of India.

Again, figures for population increase during the last three decades shown in Table III reveal the same story (B. Viswanath⁵).

TABLE III
Showing percentage of population increase

		1921-31	1931-41	1941-51
Indian Union	..	14.3	13.4	13.4
Travancore-Cochin	..	26.3	18.9	23.6
Madras	..	10.0	11.6	14.3
Uttar Pradesh	..	6.7	13.6	11.9
Bihar	..	11.6	12.3	12.3
Madhya Pradesh	..	13.7	10.3	8.6
Punjab	..	9.9	17.9	?

Travancore-Cochin State shows the highest increase. This State is highly deficit in rice, and produces and consumes tapioca and sweet potato in large quantities. This fact, again, does not appear to square with the idea of rice diet promoting fertility. The population increases in Uttar Pradesh, Bihar and Madras are

very nearly alike and yet, only in the State of Madras, rice forms the principal article of diet of the majority of the population, though in certain parts of Bihar and Eastern U.P., rice may form the staple. Further, there was a greater increase in population in Madras during 1941-51, when some wheat replaced rice on account of the shortage of the latter, than in the corresponding periods of 1931-41 and 1921-31 when practically nothing but rice constituted the staple food for the bulk of the population.

Having studied the figures available for the various States in India, a comparison may now be instituted between the birth-rates in the rice-consuming countries of the world and the corresponding figures for the non-rice-eating areas. Comparative data for ten countries are given in Table IV (Gyan Chand,³ loc. cit.).

TABLE IV
Birth-rate per mille

		1881-91	1921-25	1926-30	1931-35
United Kingdom	..	32.5	20.4	17.2	15.5
Sweden	..	39.1	19.1	15.9	14.1
Norway	..	31.0	22.2	18.0	15.3
Germany	..	36.8	22.1	18.4	15.9
France	..	23.9	19.3	18.2	16.5
Spain	..	36.2	29.8	28.5	26.9
Japan	..	27.2	34.6	33.5	31.6
Rumania	..	41.4	37.9	35.2	32.8
India	..	35.9	32.7	33.3	34.3
Italy	..	37.7	29.7	26.8	23.8

The figures in the above table do not show any specific correlation between rice consumption and fertility. On the other hand, they show a general fall in the birth-rate in the Western countries during the last about 40 years, with no major change taking place in dietary habits in so far as the staple article is concerned; presumably due to social conditions and artificial measures adopted to restrict births. The birth-rate in India has remained more or less steady during this period while in Japan, there has been an increase from 1881-91 levels. The chief cause for this rise is to be sought elsewhere than in the diet. The severe laws passed against abortion and infanticide, motivated probably by political considerations, has helped to raise the birth-rate from about 25 in 1872 to 34.6 in 1921-25, a rise unique in the history of population growth. Japan has been subsisting on rice for æons of time. Yet, her birth-rate was only 27.2 during 1881-91,

being the lowest among the ten countries for which figures have been given in Table IV, the only exception being France. Again, figures for the trend of birth-rates compiled by Whelpton and Kiser⁶ for the various countries of the world show that Central and South America have a higher birth-rate than India and Japan.

Thus, it should be clear that the existing data in India and elsewhere do not reveal any association between consumption of rice diets and increased human fertility.

1. Blunt, Sir Edward, *Social Service in India*, 1938, His Majesty's Stationery Office, London.

2. Director-General of Health Services, *Statistical Appendices to Annual Report for the years 1948 and 1949*, 1953, Manager of Publications, Delhi.
3. Gyan Chand, *India's Teeming Millions*, 1939, George Allen & Unwin Ltd., London.
4. Mukherjee, Radhakamal, *Food Planning for Four Hundred Millions*, 1938, McMillan & Co., London.
5. Viswanath, B., *Symposium, Central Food Technological Research Institute, Mysore*, 1952.
6. Whelpton, P. K. and Kiser, C. V., *Annals of the American Academy of Political and Social Science*, 1945, 237, 112.

Dr. HEM SINGH PRUTHI

ON the 30th November 1953, Dr. Hem Singh Pruthi, Plant Protection Adviser to the Government of India, and Director, Locust Control, proceeded on leave preparatory to retirement. The event marks not only a change in his personal career but also a stage in the development of entomological research and plant protection in this country.

Dr. Pruthi's early researches dealt with the morphology of some Rhynchota and Coleoptera and while at Cambridge he also studied the influence of chemical and physical conditions of water on aquatic animals, a line of research which he continued in the Zoological Survey of India at Calcutta. At the Indian Agricultural Research Institute, the study of crop and other pests and the methods of their control naturally engaged his major attention. Part of his researches also concerned the insect vectors of virus diseases of plants, a subject, which had received hardly any attention in India before. He worked and guided others so as to produce valuable contributions to the biology, ecology, systematics and control of pests of cotton, sugarcane, fruit trees, etc. Two of his notable monographs have been on the desert locust and pests of stored grains. While his distinguished predecessor, Mr. T. Bainbridge Fletcher, was a great Systematist, Dr. Pruthi may be regarded as a pioneer in many fields of research designed to provide basic information for solving the problems of pest control in different parts of India. In 1943, the University of Cambridge conferred on him its Sc.D. Degree for his researches carried out in India.

Dr Pruthi was largely responsible for the establishment of the Locust Warning Organization established by the Government of India in 1939 and he was put in charge of it and remained so up till the time of his retirement.

During the last 25 years, Dr. Pruthi has been exercising an influence over entomological research and plant protection over a country of the size of the undivided India, to an extent to which it has not been given to many entomologists to do. Under his leadership entomological research in India began to be co-ordinated and the sciences of entomology, plant pathology and even of chemistry drew closer to solve practical problems. Entomologists all over India looked to him for inspiration and guidance and the subject of plant protection acquired new importance. His has indeed been a crowded life of persistent endeavours, effective planning and solid achievements. Few entomologists have had closer associations with Dr. Pruthi in his scientific work and endeavours than the present writer. The impression about Dr. Pruthi that survives with him, as it must be with many others, is of a forceful personality in which the scientist, the administrator, the organizer and the man of sympathy and understanding are happily blended. It is fortunate, therefore, that Dr. Pruthi's retirement from Government service does not mean his retirement from active scientific life and work and all of us must wish him many more years of good health in the cause of scientific research and crop protection.

K. B. LAL.