that an energetic attempt should have been made to secure the necessary personnel and build up the necessary organization; for example, officers could have been obtained from outside the province. According to evidence presented to the Commission, the Government of India offered help in September 1943, but the reply was received that this was not required. In October, two officers from the Department of Supplies, Government of India, were sent to the Government of Bengal to help in supervising the reception and despatch of grain supplies; it appears, however, that their services were not fully utilized. We may add that there were in Calcutta businessmen whose experience of organization qualified them for such work, but according to the Government of Bengal, "all attempts to secure suitable men from the business houses proved abortive". The Bengal Government should, in July or thereabouts, have undertaken the task of setting up the organization needed to deal with the arrival of foodgrains in Calcutta under the Basic Plan and their despatch to the districts, and, if local resources were inadequate, impressed on the Government of India their need for assistance. If they had done so, the latter might have found that suitable help could be obtained only from the Army, which possessed trained personnel with experience of large scale transport problems. We have already described the vigorous steps taken by the Army to organize transport when it came to the rescue in November. If the Army had been called in two months earlier, say in September, famine mortality would have been considerably reduced.

One of the reasons why the arrangements made by the Government of Bengal to deal with transport and other problems arising during the famine were unsatisfactory was that they failed to realize the magnitude of these problems and the scale of the organization required for their successful solution. Associated with this was a reluctance to appeal for outside help even when the organization and personnel available within the province were obviously inadequate. We feel that this attitude was particularly unfortunate in the circumstances.

Reference has been made elsewhere to the inadequate storage accommodation in Calcutta and the fact that during the closing months of 1943, and in 1944, grain was stored in the open in the Royal Botanical Gardens. While we have evidence that only a small percentage of these stocks deteriorated, their storage under such conditions was undesirable for various reasons, including the effect on public opinion. According to non-official witnesses appearing before us suitable storage accommodation could have been found in Calcutta if the trade had been consulted and its co-operation invited.

72. Among other criticisms of relief measures, we may mention the view that the establishment of food kitchens was a mistake—that it would have been better to distribute food as "dry doles" through a reliable method. Unquestionably the food kitchen system led to corruption and there was much mismanagement. It was, however, the only feasible method for the general appeasement of hunger in the situation which developed from July on wards, when many thousands of people left their homes and flocked into towns and cities. The migrating masses could not have been given food in any other way. Further, rice was in short supply and unfamiliar cereals such as bajra, jowar and wheat had to be distributed. The people were unused to these and did not know how to cook them.

73. Lastly, we must refer to the view which attributes the failure to relieve the famine situation in the rural areas to the undue preoccupation of the Government of Bengal with the needs of Greater Calcutta generally, and those of the "priority classes" in particular. It is undeniable that, throughout 1943, the necessary supplies reached Calcutta and a considerable proportion of the population of Greater Calcutta obtained their supplies at subsidized prices from either

employers' shops or the controlled shops. It is also true that a relatively large proportion, about two-thirds, of the supplies of rice reaching Calcutta under the control of Government, much of which was secured from outside the province, was consumed in Greater Calcutta. The quantities sent to the districts were only a small fraction of the requirements of the poorer classes in the rural areas who were unable to buy rice at the prevailing prices. This would have been the case even if all the supplies distributed in Calcutta under Government control, about 141,000 tons, had been sent to the rural area. It seems probable that the rural areas would not have been materially helped by a reduction in the Calcutta allotment, as, in the absence of control, Calcutta would have bought more from the rural areas and raised prices still higher in the province in doing so. This would have further increased the numbers of the people who were unable to buy their supplies. In the opinion of a majority of us, the Government of Bengal is open to criticism not on the ground that Calcutta was provided with the bulk of the supplies reaching that city under Government control, but for their failure to acquire control of supplies and distribution in Bengal.

Sir Manilal Nanavati and Mr. Ramamurty do not agree with the above view regarding the distribution of available foodstuffs in the hands of the Bengal Government, during 1943. Their opinion is as follows:—

"Out of the 206,000 tons that came in the hands of the Bengal Government at Calcutta during 1943, 141,000 tons were retained in Calcutta while only 65,000 tons were sent to the mofussil.

"Prices in many parts of the mofussil were generally higher than in Greater Calcutta; more foodstuffs sent to rural areas might probably have helped to bring down the prices and would certainly have given relief to the needy. Greater Calcutta was all along well supplied with foodstuffs and there was never any serious shortage; the priorities and the Industries carried ample stocks to last them for weeks. Therefore, if more foodstuffs had been sent to the rural areas they would have been materially helped without interference with essential needs in Calcutta".

74. Sir Manilal considers that this question of Calcutta *versus* the rural areas has certain other important aspects which should be stressed. He says:—

"In my opinion, a clear conflict of interest arose early in 1943 between Calcutta, where the maintenance of supplies, especially for the priority services and War Industries, was a primary problem, and the rural areas where the lives of the poorer classes depended on the availability of supplies at reasonable prices. Inflation was raising prices, and wages in the rural areas were not responding. The denial policy in rice, boats, and cycles enforced by the Government of India, the evacuation of villages for military reasons (nearly 35,000 homesteads were affected), the floods, and the cyclone, and the failure of crops had already weakened the economy of rural Bengal. By the end of December 1942 distress had already appeared and by March 1943 widespread famine was anticipated by district officials. Consciously or unconsciously, the Bengal Government allowed the needs of the rural areas to be outweighed by those of Calcutta and particularly its big business interests. If the interests of the rural population had been kept more prominently in mind, the mistaken policies of "de-control" and "unrestricted free trade, the relaxation of the Foodgrains Control Order and other policies which encouraged profiteering and hoarding would not have been adopted. The same policy was adopted in the distribution of available stocks when every ounce was urgently needed to feed the starving, where relief works had to be slowed down at critical moments for lack of food and funds. From the moment the signs of distress appeared, the Government of Bengal should have made it clear to the Government of India as well as to the employers' organisations who had adequate resources and who had great influence, that they could not discharge their primary duty

to the population in Bengal as a whole unless they maintained strict control over prices and that, in the distribution of supplies under their control, Calcutta would not have priority over other deficit areas in the province. At the same time, they should have clearly brought to the notice of the Government of India the seriousness of the situation as it was developing and demanded their immediate attention in the strongest terms as was done by the Bombay Government. If this course had been followed, the need of Bengal for external assistance would have been recognized earlier; supplies would have been procured from outside more expeditiously; earlier attention would have been given to the state of the people in the rural areas and much of the misery would have been avoided. On the contrary when distress appeared, there was a tendency both on the part of the Government of India and of Bengal to minimize the prevalence of famine, with the result that the efforts of the Government of India to secure external supplies were prejudiced even as late as August 1943 by the mistrust and suspicion occasioned by complaints about profiteering which prevailed in Bengal. This atmosphere of mistrust influenced the situation throughout the famine. In the end not a single man died of starvation from the population of Greater Calcutta, while millions in rural areas starved and suffered."

CHAPTER XI.—GENERAL CONCLUSIONS AND OBSERVATIONS.

1. **The Background.**—The economic level of the population previous to the famine was low in Bengal, as in the greater part of India. Agricultural production was not keeping pace with the growth of population. There was increasing pressure on land which was not relieved by compensatory growth in industry. A considerable section of the population was living on the margin of subsistence and was incapable of standing any severe economic stress. Parallel conditions prevailed in the health sphere; standards of nutrition were low and the epidemic diseases which caused high mortality during the famine were prevalent in normal times. There was no "margin of safety" as regards either health or wealth. These underlying conditions, common indeed to many other parts of India, were favourable to the occurrence of famine accompanied by high mortality.

2. **The basic causes of the famine.**—Shortage in the supply of rice in 1943 was one of the basic causes of the famine. The main reason for this was the low yield of the *aman* crop reaped at the close of 1942. Another reason was that the stocks carried over from the previous year (1942) were also short. The *aman* crop reaped at the end of 1940 was exceptionally poor and in consequence stocks were heavily drawn upon during 1941. The *aman* crop reaped in December 1941 was a good one, but not so good as to enable stocks to be replenished materially. After the fall of Burma early in 1942, imports from that country ceased, but exports from Bengal to areas which were more seriously dependent on imports from Burma, increased during the first half of the year. This also contributed to some extent to the smallness of the carry-over from 1942 to 1943. Again, during 1943 the loss of imports from Burma was only partially offset by increased imports from other parts of India. It appears probable that the total supply during 1943 was not sufficient for the requirements of the province and that there was an absolute deficiency of the order of 3 weeks' requirements. This meant that even if all producers sold their entire surplus stocks without retaining the usual reserve for consumption beyond the next harvest, it was unlikely that consumers would have secured their normal requirements in full.

In the summer of 1942, that is, some months before the failure of the *aman* crop in Bengal, a situation had arisen in the rice markets of India, including those in Bengal, in which the normal trade machinery was beginning to fail to distribute supplies at reasonable prices. This was due to the stoppage of imports of rice from Burma and the consequent transfer of the demands of Ceylon, Travancore, Cochin, and Western India, formerly met from Burma, to the markets in the main rice producing areas of India. Other circumstances arising out of the war also accentuated the disturbances to normal trade. In Bengal, owing to its proximity to the fighting zone and its position as a base for military operations in Burma, the material and psychological repercussions of the war on the life of the people were more pronounced in 1942, and also in 1943, than elsewhere in India. The failure of the *aman* crop at the end of 1942, in combination with the whole existing set of circumstances, made it inevitable that, in the absence of control, the price of rice would rise to a level at which the poor would be unable to obtain their needs. It was necessary for the Bengal Government to undertake measures for controlling supplies and ensuring their distribution at prices at which the poor could afford to buy their requirements. It was also necessary for the Government of India to establish a system of planned movement of supplies from surplus to deficit provinces and states.

There was delay in the establishment by the Government of India of a system of planned movement of supplies. The Bengal Government failed to secure control over supply and distribution and widespread famine followed a rise of prices to abnormal levels—to five to six times the prices prevailing in the early months of 1942. This rise in prices was the second basic cause of the famine. Famine, in the form in which it occurred, could have been prevented by resolute action at the right time to ensure the equitable distribution of available supplies.

3. **The Government of Bengal.**—When the price of rice rose steeply in May and June 1942, the Government of Bengal endeavoured to bring the situation under control by the prohibition of exports and by fixing statutory maximum prices. In the absence of control over supplies, price control failed, but by September 1942, supplies and prices appeared to have reached a state of equilibrium. This month was a critical one in the development of the famine. If the Government of Bengal had set up at that time a procurement organization, the crisis, which began about two months later, would not have taken such a grave turn.

With the partial failure of the *aman* crop at the end of 1942, the supply position became serious and prices again rose steeply. If a breakdown in distribution was to be averted, it was essential that Government should obtain control of supplies and prices. The measures taken by the Government of Bengal to achieve control of supplies and prices during 1943 were inadequate and, in some instances wrong in principle. In January and February 1943, the Provincial Government endeavoured unsuccessfully to obtain control of supplies and to regulate prices by means of procurement operations. Better success would have been achieved if procurement had been undertaken by an official agency instead of by agents chosen from the trade, and if Government had made it clear that they would not hesitate to requisition from large producers as well as from traders, in case supplies were held back. The decision in favour of "de-control" in March 1943 was a mistake. In the conditions prevailing in Bengal at the time, it was essential to maintain control; its abandonment meant disaster. We refer to this matter again in the immediately succeeding paragraph. The Government of Bengal erred in pressing strongly for "unrestricted free trade" in the Eastern Region in May 1943 in preference to the alternative of "modified free trade". The introduction of "unrestricted free trade" was a mistake. It could not save Bengal and was bound to lead to severe distress and possibly starvation in the neighbouring areas of the Region.

One result of the policy underlying "de-control" and "unrestricted free trade" was that the greater part of the supplies reaching Calcutta was not under the control of Government. So long as this policy was followed it was not possible to introduce rationing in Greater Calcutta. Even after the policy was reversed, there was considerable delay in the introduction of rationing. The absence of control over the distribution of supplies in Calcutta and the failure to introduce rationing at any time during 1943 contributed largely to the failure of control over supplies and prices in the province as a whole.

The arrangements for the receipt, storage, and distribution of food supplies despatched to Bengal from other parts of India during the autumn of 1943 were thoroughly inadequate and a proportion of the supplies, received during the height of the famine, was not distributed to the needy in the districts, where such food was most required. Better arrangements for the despatch and distribution would have saved many lives.

While reports of distress in various districts were received from Commissioners and Collectors from the early months of 1943, the Provincial Government did not call for a report on the situation in the districts until June, and detailed instructions relating to relief were not issued till August. Famine was not declared. The delay in facing the problem of relief and the non-declaration of

famine were bound up with the unfortunate propaganda policy of "No Shortage" which, followed during the months April to June with the support of the Government of India, was unjustified when the danger of famine was plainly apparent. The measures initiated in August were inadequate and failed to prevent further distress, mainly because of the disastrous supply position which had been allowed to develop. A Famine Relief Commissioner was not appointed till late in September. It appears that at one stage in 1943, the expenditure on relief was limited on financial grounds. There is no justification, whatsoever, for cutting down relief in times of famine on the plea of lack of funds. If necessary, funds should be provided by borrowing in consultation with the Reserve Bank or the Government of India. This principle holds even when, as in the Bengal famine, food was more urgently required than money for relief purposes. The medical relief provided during 1943 was also inadequate. Some of the mortality which occurred, could have been prevented by more efficient medical and public health measures.

Between the Government in office and the various political parties, and in the early part of the year, between the Governor and his Ministry, and between the administrative organization of Government and the public there was lack of co-operation which stood in the way of a united and vigorous effort to prevent and relieve famine. The change in the Ministry in March-April 1943, failed to bring about political unity. An "all-party" Government might have created public confidence and led to more effective action, but no such Government came into being. It may be added that during and preceding the famine, there were changes in key officers concerned with food administration. In 1943, there were three changes in the post of Director of Civil Supplies.

Due weight has been given in our report to the great difficulties with which the Bengal Government were faced. The impact of the war was more severe in Bengal than in the rest of India. The "denial" policy had its effect on local trade and transport, and in particular affected certain classes of the population, for instance, the fishermen in the coastal area. The military demands on transport were large. There was a shortage of suitable workers available for recruitment into Government organizations concerned with food administration and famine relief. The cyclone and the partial failure of the *aman* crop were serious and unavoidable natural calamities. But after considering all the circumstances, we cannot avoid the conclusion that it lay in the power of the Government of Bengal, by bold, resolute and well-conceived measures at the right time to have largely prevented the tragedy of the famine as it actually took place. While other Governments in India were admittedly faced with a much less serious situation than the Government of Bengal, their generally successful handling of the food problem, and the spirit in which those problems were approached, and the extent to which public co-operation was secured stand in contrast to the failure in Bengal.

4. **The Government of India.**—The Government of India failed to recognize at a sufficiently early date, the need for a system of planned movement of foodgrains, including rice as well as wheat, from surplus to deficit provinces and states; in other words, the Basic Plan should have come into operation much earlier than it did. With regard to wheat, an agreement should have been reached at an early stage between the Government of India and the Government of the Punjab about the price level to be maintained and the establishment in that province of an adequate procurement organization. If this had been done, the price of wheat would have remained under control and it should have been possible to send to Bengal a large proportion of the supplies which reached that province towards the close of the year, at an earlier period when they would have been much more useful. In the closing months of 1942, and the first two months of 1943, the supplies of wheat reaching Calcutta were only

a fraction of normal requirements. If adequate supplies had been available in these months, the pressure on the Calcutta rice market, in so far as it arose out of the shortage of wheat, would have been reduced. Again, if the Basic Plan in regard to rice had come into operation in the beginning of 1943, it would have been possible to provide Bengal at an earlier date with supplies of rice in approximately those quantities which were obtained later in the year from other provinces and states.

The Government of India must share with the Bengal Government responsibility for the decision to de-control in March 1943. That decision was taken in agreement with the Government of India and was in accordance with their policy at the time. By March the position had so deteriorated that some measure of external assistance was indispensable if a disaster was to be avoided. The correct course at the time was for the Government of India to have announced that they would provide, month by month, first, the full quantity of wheat required by Greater Calcutta, and secondly, a certain quantity of rice. It would, then have been possible for the Government of Bengal to have maintained controlled procurement, and secured control over supply and distribution in Greater Calcutta. The Government of India erred in deciding to introduce "unrestricted free trade" in the Eastern Region in 1943 in preference to "modified free trade". The subsequent proposal of the Government of India to introduce free trade throughout the greater part of India was quite unjustified and should not have been put forward. Its application, successfully resisted by many of the provinces and states, particularly by the Governments of Bombay and Madras, might have led to serious catastrophe in various parts of India.

By August 1943, it was clear that the Provincial Administration in Bengal was failing to control the famine. Deaths and mass migration on a large scale were occurring. In such circumstances, the Government of India, whatever the constitutional position, must share with the Provincial Government the responsibility for saving lives. The Government of India sent large supplies of wheat and rice to Bengal during the last five months of 1943, but it was not till the end of October, when His Excellency the Viceroy, Lord Wavell, visited Bengal, as his first duty on taking office, that adequate arrangements were made to ensure that these supplies were properly distributed. After his visit, the whole situation took an immediate turn for the better.

We feel it necessary to draw attention to the numerous changes in the individuals in charge of food administration of the Government of India during the crucial year of the famine. Mr. N. R. Sarker, the Food Member, resigned in February 1943, and His Excellency the Viceroy, Lord Linlithgow, held the food portfolio without a Member to assist him until May. The Secretary of the Food Department, Mr. Holdsworth, fell ill during this period and died. His place was taken by the Additional Secretary, Major-General Wood, a Military Officer new to the problems of civil administration. Sir Azizul Haque became Member in charge of the Food Department in May. He was succeeded by Sir J. P. Srivastava in August and a new Secretary of the Department, Mr. Hutchings, was appointed in September.

In Bengal, the new Ministry took office towards the end of April and Sir Thomas Rutherford became Governor in September 1943, replacing the late Sir John Herbert, then suffering from the illness of which he subsequently died.

Thus, during the various critical stages in the famine, heavy responsibility fell on individuals who were new to their posts.

5. The people and the famine.—We have criticized the Government of Bengal for their failure to control the famine. It is the responsibility of the Government to lead the people and take effective steps to prevent avoidable catastrophe. But the public in Bengal, or at least certain sections of it, have

also their share of blame. We have referred to the atmosphere of fear and greed which, in the absence of control, was one of the causes of the rapid rise in the price level. Enormous profits were made out of the calamity, and in the circumstances, profits for some meant death for others. A large part of the community lived in plenty while others starved, and there was much indifference in face of suffering. Corruption was widespread throughout the province and in many classes of society.

It has been for us a sad task to inquire into the course and causes of the Bengal famine. We have been haunted by a deep sense of tragedy. A million and a half of the poor of Bengal fell victim to circumstances for which they themselves were not responsible. Society, together with its organs, failed to protect its weaker members. Indeed there was a moral and social breakdown, as well as an administrative breakdown.

PART II

DEATH AND DISEASE IN THE BENGAL FAMINE

CHAPTER I.—MORTALITY

A.—Total mortality.

1. According to figures published by the Bengal Public Health Department, 1,873,749 people died in Bengal in 1943. The average number of deaths reported annually during the previous 5 years, 1938 to 1942, was 1,184,903, so that deaths in 1943 were 688,846 in excess of the quinquennial average. The reported death rates per *mille* in Bengal in the five years preceding the famine ranged from 19·6 to 25·0, with an average of 21·2. In the famine year of 1943 the rate rose to 30·9 per *mille*.

Nearly all the famine mortality occurred in the second half of the year. During the first 6 months mortality was only 1·9 per cent. in excess of the quinquennial average. From July to December 1943, 1,304,323 deaths were recorded as against an average of 626,048 in the previous quinquennium, representing an increase in mortality of 108·3 per cent.

2. Death continued to take its toll in 1944. In the first 6 months of 1944, 981,228 deaths were recorded, an excess of 422,371 over the quinquennial average. The death rate during the year from July 1943 to June 1944 reached 37·6 per *mille*. The complete mortality figures for 1944, which are not available at the time of writing, may show that, as far as excess mortality is concerned, the year 1944 was almost as disastrous as the previous one.

B.—Accuracy of mortality statistics.

3. All public health statistics in India are inaccurate. Mortality figures indicate trends in the death rate but can rarely be accepted as absolute. Even in normal times, deaths are not fully recorded and the number of births registered may be 20 to 25 per cent. below the number of births that have actually occurred.[1] The famine mortality statistics issued by the Bengal Public Health Department, it may be remarked, tell a sufficiently tragic story as they stand. Many people have, however, maintained that they grossly underestimate the actual number of deaths. Thus, witnesses appearing before members of the Commission in Dacca estimated deaths in the district in 1943 as one million, whereas the figure recorded by the Public Health Department was 149,000 (70,000 in excess of the quinquennial average). Professor K. P. Chattopadhyaya, Department of Anthropology, Calcutta University, made an estimate of the total mortality in 1943—3·5 million deaths—which has received wide publicity. This was based on surveys of sample groups in the worst famine areas, in which the mortality rate was 10 per cent, and it was assumed that two-thirds of the population of the province were equally affected by the famine. The method of investigation followed cannot be accepted as statistically sound; to estimate the provincial death rate from a sample of this nature is unjustifiable. When the famine was at its height dead and dying people were all too visible in famine-stricken areas, and it is natural that in such circumstances exaggerated estimates of mortality should have gained credence.

4. While the Commission cannot accept popular views on mortality, it is nevertheless of the opinion that the official figures under-estimate the total

[1]Report of the Public Health Commissioner with the Government of India, 1936.

number of deaths. In rural Bengal, as elsewhere in India, the primary collector of mortality statistics is a village functionary to whom deaths are reported by relations of the deceased in the village. The village *chowkidar* [1] (previous to 1944), reported deaths to the Union Board office, whence by several stages the records ultimately reached the office of the Director of Public Health. The *chowkidar* also reports the cause of deaths. In normal times the system scarcely lends itself to scientific accuracy and in 1942, and 1943 other factors making for errors and omissions were introduced. In certain places the salaries of *chowkidars* were not paid and they deserted their posts to obtain work on military projects and aerodromes. During the famine *chowkidars* were not immune from starvation and disease and some of them died. The replacement of dead and vanished *chowkidars* was no easy matter and several weeks or months might elapse before successors could be found, during which deaths presumably went unrecorded. Further, in the height of the famine thousands of people left their homes and wandered across the countryside in search of food. Many died by the road-side—witness the skulls and bones which were to be seen there in the months following the famine. Deaths occurring in such circumstances would certainly not be recorded in the statistics of the Director of Public Health.

5. There was a remarkable fall in 1943, in the number of deaths recorded in infants under one month. Deaths in this age group numbered 101,406, the quinquennial average being 138,780—a *decrease* of 26·8 per cent. This reduction in neo-natal mortality may be to a considerable extent due to a fall in the number of live births; the recorded birth-rate actually fell from 28·0 (quinquennial average) to 18·8 per *mille*. It seems probable, however, that during the famine a large proportion of deaths of infants under one month was not recorded and that a similar factor operated in the reported fall in the birth-rate. The lower mortality reported in infants under one month—an age group which normally makes a large contribution to total mortality—must be borne in mind in assessing the number of deaths by comparing deaths in 1943 with the quinquennial average.

6. At the end of 1943 a considerable effort was made, by civil and military medical authorities, to improve the registration of deaths. Emergency medical workers were instructed to supervise the recording of deaths by *chowkidars* and to check and accelerate the whole system. The result was an unquestionable improvement in the collection of mortality statistics and the figures for the first half of 1944, can probably be regarded as reasonably accurate. A graph showing recorded mortality, month by month, is given on page 113. It is significant that there was a fall in January 1944, after registration had been improved. No doubt the actual number of deaths fell at this stage owing to the provision of food supplies, but the health situation remained very serious. If the figures recorded in 1943 were a gross under-estimate (*e.g.*, half the actual number of deaths) one would expect that any real fall in the death-rate in January would be offset by the greater accuracy of registration, and that the result would have been a rise in recorded mortality.

7. In spite of the conditions produced by the famine, there was no universal breakdown in 1943 in the system of recording deaths. We made careful inquiries on this point from local officials and other witnesses. After due consideration of the available facts we are of the opinion that the number of deaths in excess of the average in 1943 was of the order of one million—that is, some 40 per cent. in excess of the officially recorded mortality. We have found no valid reason for accepting estimates in excess of this figure. On the other hand, the high excess mortality in 1944 must be added to the toll of

[1] The *chowkidar* or village watchman is apart-time village servant, usually illiterate, and paid about Rs. 6 or Rs. 7 a month.

mortality. On this basis we must conclude that about 1·5 million deaths occurred as a direct result of the famine and the epidemics which followed in its train.

C.—Age and Sex Mortality

8. Various views were expressed to the Commission as regards the age and sex groups on which mortality fell most heavily. In some areas women and children appeared to be the principal victims, since many of the men had left home to seek employment elsewhere. The destitutes who thronged the relief kitchens in Calcutta and other centres seemed to be for the most part children, women, and old people of both sexes, and mortality among such wandering destitutes was high. On the other hand, opinions were given that in villages from which little or no migration took place, more men died than women. The effect of the famine on the age distribution of the population of Bengal is a question which deserves careful investigation. In view of errors and omissions in the recording of deaths to which previous reference has been made, it is, however, by no means easy to reach satisfactory conclusions. The data available for study include the public health statistics for 1943 and the results of various inquiries on sample groups submitted to the Commission.

9. Male and female deaths reported in 1943 numbered 998,428 and 875,321 respectively, a difference of 123,107 to the disadvantage of males. Actually more male than female deaths are normally reported in Bengal, which is due to the higher proportion of males in the population, and to the excess of male births (108 male to 100 female), which leads to more deaths among infants of the male sex.[1] If, however, the average number of male and female deaths in the previous quinquennium is compared with the figures for 1943, it is found that the increase in male deaths was 62·5 per cent, as compared with 53·2 per cent in the case of female deaths. The preponderance of male deaths is confirmed by a sample survey carried out in various rural areas by Mr. T. C. Das, Lecturer in Social Anthropology, University of Calcutta. Of 4,833 deaths investigated, 56·7 per cent were male and 42·3 per cent female. The same trend is shown in the records of deaths in famine hospitals in various centres.

10. The excess in male deaths was more marked in the adult age groups. Up to 10 years the increase in mortality was almost equal in both sexes. In the age group 10 to 15, the rise in the number of male deaths was somewhat greater than in the case of female deaths, but the difference is not striking. In the groups between 10 and 60, 515,290 deaths in males were recorded as against 439,273 in females. the percentage increases in mortality over the quinquennial average being as follows:—

Age group	*Percentage increase over quinquennial average of deaths in 1943.*	
	Male	*Female*
15-20	98·3	48·8
20-30	82·9	59·1
30-40	98·8	88·9
40-50	103·6	90·9
50-60	93·2	76·3

[1]The Census Report of 1941 gives 32,360,401 males and 29,099,976 females.

11. It must, however, be mentioned that the results of a series of sample inquiries in rural areas, analysed by Professor P. C. Mahalanobis, Statistical Laboratory, Presidency College, Calcutta, are not in agreement with the provincial sex mortality data. The investigation covered 2,622 families (13,652 individuals), inhabiting villages in 7 sub-divisions. In the groups as a whole, the percentage mortality among females in 1943 was higher than the percentage mortality among males. (Infants of both sexes below one year were left out of the calculation). There was, however, considerable irregularity in the proportionate sex mortality in the various sub-divisions, and in some sub-divisions the male mortality, on a percentage basis, exceeded the female. The aggregate figures are influenced by the data from one sub-division in which, for some reason, female deaths greatly exceeded male deaths.

12. As regards mortality by age, the decrease in the reported number of deaths in infants under one month has already been referred to. The number of deaths in infants aged 1 to 12 months increased, but the total deaths under one year declined as a result of the reported fall in neo-natal mortality. A large number of deaths occurred in the age groups 1 to 5 and 5 to 10. The number of deaths in old people over 60 was also high, 247,556 as compared with the quinquennial average of 154,405. The age groups 1 to 10 and 60 and over contributed between them 274,810 of the excess deaths in 1943, but since the mortality in these groups is normally high, their excess mortality was slightly lower than that in the intermediate age groups.

13. Mortality in Calcutta in 1943 shows different trends from those shown by the data for the whole province. The proportionate increase in male and female deaths was reversed, the former being 52·7 per cent in excess of the quinquennial average and the latter, 72·2 per cent. The percentage increase in female deaths exceeded that in male deaths in almost all the age groups. The total number of male deaths reported was greater than that of female deaths, but this is due to the preponderance of males in the industrial population of Calcutta. According to the 1941 census, males in Calcutta outnumbered females by about two to one.

14. The greatest excess mortality in Calcutta was recorded in the age groups 1 to 5, 5 to 10, and over 60, the percentage increase in mortality in these groups being 223·1, 85·1 and 192·6 respectively. The mortality statistics thus confirm the impression that women, children, and old people were in the majority in the famine-stricken population which sought food and relief in the capital. It may be added that the recording of deaths in Calcutta is likely to be more accurate than elsewhere in Bengal, since no dead body can be disposed of by cremation or burial without notifying the municipal health authorities.

15. Finally, attention should be drawn to one factor which may influence the records of age and sex mortality in the districts. Omissions in the registration of deaths may not have been equally distributed in the different age and sex groups. We have referred to unrecorded road-side deaths. It is not unlikely that these included more women and children than men.

16. The above analysis is based largely on the mortality figures of the Public Health Department as they stand. The quotation of recorded mortality figures, including digits down to the tens and hundreds, and the calculation of percentages to one place of decimals, tends to give a false air of accuracy. We must again emphasize that all the figures given are inaccurate and should not be regarded as indicating more than general trends in mortality.

17. We incline to the view that in the province as a whole famine mortality was greater among men than in women. There were, however, undoubtedly places such as Calcutta where the reverse was the case. Assuming the higher male mortality to be a fact, it is by no means easy to suggest reasons for it. Possibly men, with larger food requirements than women, suffered more acutely as food supplies dwindled away to nothing. Men may have attempted, more often than women, to remain at work in spite of increasing starvation, and thus used up their bodily reserves more rapidly. Again, women and children may have sought relief at food kitchens more readily than men. It is known that large numbers of families have been deprived of their bread-winners and large numbers of women have been left widows. Responsibility for the care of the widows and orphans of the famine has been accepted by Government as part of the rehabilitation programme. Our tentative conclusions about sex mortality emphasize the extent of the task involved.

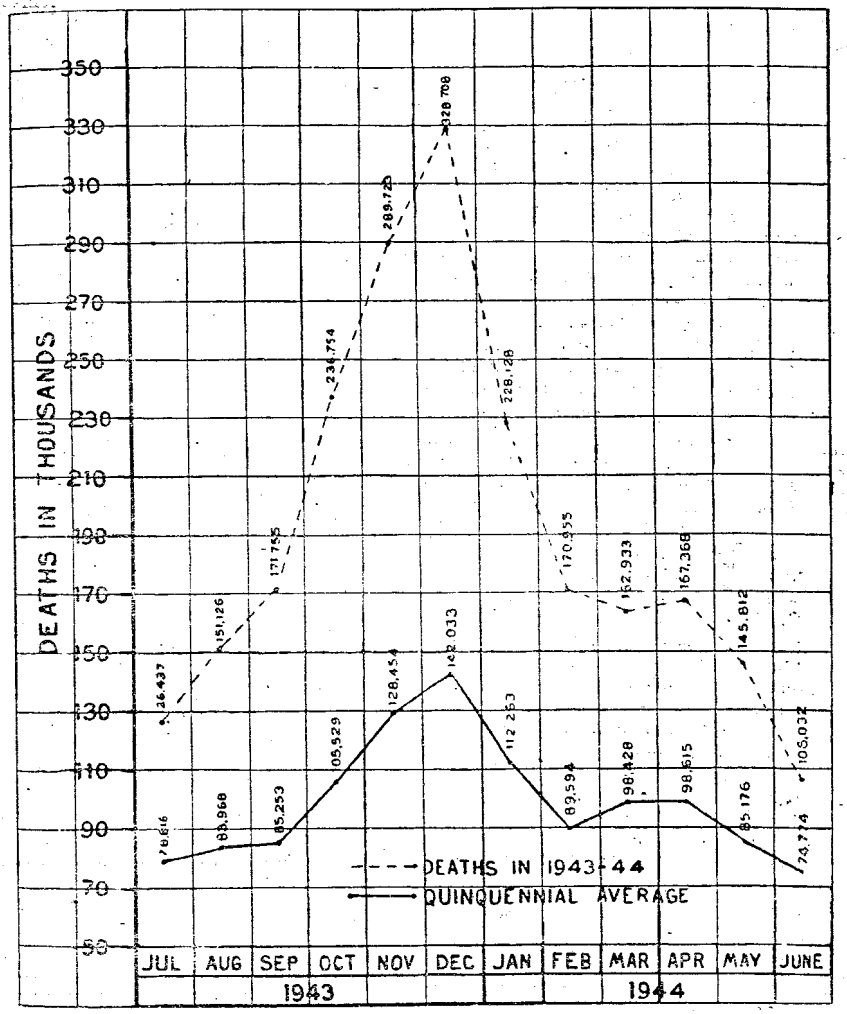
18. A considerable fall in the birth-rate must unquestionably have occurred. This effect of famine is referred to in earlier reports on famine in India. Thus, it was said that in Orissa in 1866 and 1867, the birth-rate was reduced almost to nothing. According to a report on the Madras famine of 1876-7, in 9 famine districts the birth-rate fell from 26 per *mille* in 1876 to 20·3 per *mille* in 1877, and to 13·8 in 1878. The number of births in these two years was calculated as being 200,000 less than in two average years. In certain districts the birth-rate fell to 4 to 5 per *mille*. The reported fall in the birth-rate in Bengal in 1943 from 28·0 (quinquennial average) to 18·8 means a loss of 500,000 to 600,000 births. While the accuracy of this figure may be questioned, there is no reason to doubt that births were greatly decreased in the Bengal famine, as in earlier famines. The decrease will influence the age composition of the population in future years and the curve of population growth. The latter will, of course, also be affected by the total famine mortality, and notably by the mortality among females of all ages up to the end of the child-bearing period.

19. The falling-off in the number of live births during famine is presumably due largely to an increase in the incidence of abortion, miscarriage, and still-birth resulting from malnutrition and disease. It is well known that a woman's capacity to bear living children is impaired by malnutrition, while malaria frequently leads to abortion. The disruption of family life must also be an operative factor, particularly in the later stages of famine.

D.—Course of Mortality

20. In May and June, 1943, the death rate began to rise in the districts of Rangpur, Mymensingh, Bakarganj, Chittagong, Noakhali, and Tipperah. The most striking increase was in Chittagong and the neighbouring district of Noakhali, where, after a steep rise in May, the number of deaths was twice the quinquennial average in June, and 3 to 4 times the average in July. It was in fact in these districts that the famine first made itself evident. In July the reported death-rate was above the average in all districts except Hooghly, Jessore, and Malda, but the rise was of a comparatively small order. From August onwards, the number of deaths rose rapidly, reaching its peak in December. The actual numbers recorded monthly are shown below, in comparison with the quinquennial average. It will be noted that the famine mortality curve follows the quinquennial mortality curve, which also attained its highest point in December. This suggests that during the last few months of the year, the presence of famine accentuated the lethal effect of disease present in lesser degree in normal times.

Number of monthly deaths reported in Bengal from July 1943 to June 1944, compared with the average in the previous quinquennium.



21. The death-rate in Calcutta, unlike that in the province as a whole, reached its peak in October, 1943. The decrease in November and December was no doubt due to the distribution of food, the increase in hospital accommodation, the better care and treatment of patients, and the removal of destitutes to camps outside the city.

22. Study of the mortality recorded in the various districts in Bengal in 1943 and 1944, reveals some important facts. Some districts are normally surplus in rice supplies, others deficit, while a third group is more or less self-supporting. In 1943, the usual order in this respect was disturbed in various ways. Thus, Midnapore is normally a surplus district and was taken as such for purposes of the Bengal Government's Procurement Scheme in 1944. In 1943, however, it was heavily deficit as a result of the cyclone, which produced famine conditions and serious health problems in certain districts before the great famine began. Again, rice supplies in various districts which are normally surplus, notably certain districts in West Bengal, were reduced as a result of the short crop. No satisfactory information about rice supplies in any district, in relation to the needs of the population, is in fact available. It is thus difficult to compare mortality and the degree of scarcity district by district. Comparison is also affected by the migration of famine victims, who in general tended to wander from the worst areas to places where they had at least some hope of obtaining food.

23. In spite of these facts—to which must be added the general inaccuracy of the mortality figures—certain rough conclusions can be drawn. Early in 1943, certain districts were regarded as "buying areas" by the Government of Bengal. These were: Bakarganj, Burdwan, Birbhum, Bogra, Dinajpur, Jalpaiguri, Malda, and Rajshahi. It is impossible to say how far these districts were genuinely surplus; in Burdwan, for example, crops in two sub-divisions had been damaged in 1942 and 1943, by insect pests and flood. But at least scarcity was less acute in them than in certain other parts of the province. Chittagong, Dacca, Faridpur, Tipperah, and Noakhali, normally deficit areas, were unquestionably seriously short of supplies in the famine year. The excess mortality recorded in these districts in 1943 was in general considerably higher than in the buying areas. It ranged from 51·1 per cent in Faridpur to 121·0 per cent in Chittagong, the excess in Tipperah, Dacca, and Noakhali being 118·6, 85·7, and 95·9 per cent respectively. In the districts declared buying areas, excess mortality ranged from 2·8 per cent (Malda) to 60·5 per cent (Birbhum). In none of the others did it exceed 45 per cent. In the remaining districts of Bengal, excess mortality exceeded 50 per cent in Murshidabad (96·5) Howrah (71·5), 24-Parganas (76·1), Midnapore (58·1), Rangpur (55·4), and Nadia (82·4). Of these, Midnapore was in a special position, while Howrah and 24-Parganas, which are near Calcutta, were subject to the drain of the Calcutta demand. 24-Parganas had also suffered to some extent from the cyclone. In certain sub-divisions of Murshidabad, the *aman* crop of 1943-44, was a total failure. In the Nilphamari sub-division of Rangpur, there had been failure of crops for 2 successive years as a result of drought.

24. Thus, in a very broad way, mortality during the first six months of the famine was related to the degree of local scarcity. But in almost all the districts, whatever their position as regards production and supplies of rice, there was some increase in the death-rate. The rise in price was general throughout Bengal and led to starvation even in districts which were not obviously deficient in their total supplies. Further, epidemic diseases were not confined to the areas in which food shortage was most acute.

25. In the first six months of 1944 there was a general rise in the death-rate in the districts which had not suffered severely in 1943, while it continued on a high level in most of the latter. In Birbhum, Dacca, Rangpur, 24 Parganas, Murshidabad, Malda, and Tipperah, excess mortality in the first six

months of 1944 exceeded 90 per cent Tipperah, Rangpur, Malda, and Dacca being the worst affected. In all the other districts, except Darjeeling which is an isolated hill district dissimilar in nature to the rest of Bengal, it ranged from 26 to 86 per cent. A very appreciable fall in excess mortality occurred in Chittagong (31·3 per cent, as compared with 204·1 in the previous six months), but in Tipperah the death-rate remained extremely high, being 111·3 per cent. in excess of the quinquennial average. Of all districts in Bengal, Tipperah suffered most severely during the famine.

The mortality figures show that almost the whole of Bengal, in greater or lesser degree, was affected by the famine and the outbreaks of epidemic disease associated with it. The extent of the area involved made the problem of combating epidemics and providing medical relief an enormous one.

CHAPTER II.—CAUSES OF DISEASE AND MORTALITY

A.—Health previous to the famine

1. In normal times, malaria, cholera, and small-pox are endemic in Bengal and serious epidemics of these diseases are of frequent occurrence. The state of nutrition of a considerable section of the population was poor. The same can of course be said of many other parts of India. The calamity of famine fell on a population with low physical reserves and circumstances were favourable for a flare-up of epidemic disease. The association between health conditions in normal times and the high famine mortality must be underlined.

B.—Lack of food

2. A high proportion of the deaths which took place in the early stages of the famine can best be described as deaths from starvation. It is true that disease of some kind or another was usually present in starving patients, adding to the seriousness of their condition. Very commonly such patients suffered from "famine diarrhoea", often seen as an uncontrollable diarrhoea which led to dehydration, rapid weakening and death. Other kinds of disease were also frequently present in starving destitutes. There was a considerable excess mortality from malaria and cholera as early as July, 1943. The difference between death from simple starvation and death occurring in a starved individual who is suffering from disease is of medical interest, but a negligible difference when the broad facts of famine mortality are under consideration.

3. We can perhaps roughly distinguish between two phases of famine mortality and disease. During the first months of the famine, the emphasis was on starvation, with or without coincident disease, as a cause of death. At a somewhat later stage, epidemic diseases took precedence over starvation. The peak in cholera mortality occurred in October and November 1943, while in the case of malaria December stands out as the worst month. By the end of the year, with the reaping of the *aman* crop, and the provision of food to the famine victims through the medium of relief kitchens, etc., deaths from sheer starvation diminished. When this stage was reached the main medical and public health problem became that of epidemic disease, notably malaria. But even when relief measures had been in operation for some time, and adequate food supplies for the province as a whole were available, the recovery of sections of the population from under-and mal-nutrition was slow, and survivors belonging to the classes affected remained in a poor state of health. Throughout the famine the provision of suitable nourishment to patients in famine hospitals was of primary importance in treatment, although it was in the early stages that the problem of resuscitating cases of starvation by suitable therapeutic measures was most acute.

C.—Disease in Calcutta famine hospitals.

4. Epidemic diseases were prevalent among famine victims in Calcutta as in other parts of Bengal. For example, investigations carried out in Calcutta towards the end of 1943 showed that some 40 per cent. of destitute patients harboured malaria parasites. But in general the picture seen in the Calcutta emergency hospitals from August to November 1943 was that of acute starvation and its effects. Many of the patients in the hospitals were picked up on the streets in a state of extreme weakness and collapse, often on the point of death. They were for the most part emaciated to such a degree that the description "living skeletons" was justifiable. Weight was often reduced by

as much as one-third of the normal; that of men who normally weighed 120 to 130 lbs. fell to 80 to 90 lbs. When this degree of emaciation is reached as Alexander Porter points out in his book "The Diseases of the Madras Famine of 1877-8", "life is held by a slender thread which the least untoward circumstance is sufficient to snap."

5. Many suffered from mental disorientation, showing a very marked degree of apathy and indifference to their surroundings. When taken to hospital, such patients made little effort to help themselves and received medical attention with an indifference which sometimes amounted to passive obstruction. They did not care how dirty or naked they were. Those with famine diarrhoea would repeatedly soil their beds and pay no attention to the protests of the attendants. In a few cases maniacal symptoms were present. The mental state of many starving destitutes indeed sometimes disconcerted workers in famine hospitals, who were not aware that it was a pathological condition induced by starvation. There was some tendency to regard starvation cases as needlessly dirty and uncooperative and, since they made little effort to help themselves, not worth helping. Actually, the clouding of the mind induced by starvation cleared in a few days, if the patient could be rallied by suitable dietary and medical treatment.

6. The exact causes of so-called "famine diarrhoea" are at present unknown. They may include the following:

(a) Unsuitable food which is not digested and leads to irritation of the intestines. The spectacle of starving destitutes ransacking refuse bins was common in Calcutta during the height of the famine.

(b) Impairment of the digestive functions of the intestines, and actual anatomical changes in the intestinal wall, due to the consumption of a diet grossly inadequate in quantity and defective in quality.

(c) Infection with dysenteric organisms.

A high death rate from "dysentery and diarrhoea" has been reported in earlier famines in India. In the nineteenth century, the term "famine diarrhoea" was often used. If the recorded mortality from dysentery and diarrhoea during the course of earlier famines is studied, it is found that the number of deaths ascribed to this cause rose and fell according to the severity of famine conditions, that is, the degree of starvation. A similar phenomenon is observable in the mortality statistics of Calcutta during the second half of 1943. When the famine was at its worst, famine diarrhoea was perhaps the most formidable problem with which the medical relief agencies had to deal.

7. Many patients showed famine oedema or dropsy, the dropsical swelling often masking the gross underlying emaciation. Dropsy invariably makes its appearance under famine conditions; for example, it was widely prevalent in the under-fed population of Central Europe during and just after the last war. Protein deficiency is usually considered to be the chief cause. In the Bengal famine victims, it was often associated with anaemia. An interesting observation was that malaria not infrequently developed in patients who had rallied after a few days' stay in hospital. The temperature would rise and malaria parasites would be found in the blood. This may be explained in two ways: either the parasite was unable to multiply in a starved body and revived together with its host, or during the phase of starvation, it was present as in the later febrile stage, but, owing to the low state of the patient, produced no febrile reaction.

Anaemia was prevalent in patients in famine hospitals at all stages of the famine. This was no doubt largely due to the combined effects of under-nutrition and malaria.

8. The treatment of cases of acute starvation cannot be considered in detail in this report. A research unit in Calcutta, financed by the Indian Research Fund Association, made a study of this subject and published a brochure entitled "The Treatment and Management of Starving Sick Destitutes", which contains much useful information. The essentials of treatment are the provision of nourishment in suitable form and good nursing. Nutritious food must be administered at first in small quantities and then in gradually increasing amounts as the patient recovers. Good results were obtained in cases of severe inanition by the injection of "protein hydrolysate", an extract of meat containing protein in pre-digested form. Disease present in starving patients must of course be appropriately treated.

9. Many collapsed cases admitted to the Calcutta hospitals died within a few hours. Probably no form of treatment could have saved them. Sometimes very weak patients survived for a few days in hospital and appeared to be rallying when they suddenly died. This phenomenon, which was observed by Alexander Porter in the Madras famine of 1877-8, illustrates his remark that in the circumstances "life is held by a slender thread".

10. Starving destitutes did not show vitamin deficiency diseases, which are usually associated with chronic malnutrition, with the emphasis on qualitative rather than quantitative defects in the diet. The rarity of such diseases throughout the famine was somewhat surprising. In general, the condition of destitutes in Calcutta—and no doubt in other centres—in the early stages of the famine was indicative of acute starvation, into which they had fallen within the space of 2 to 3 months, and not of prolonged under-nutrition. The destitutes who left their homes to seek relief were not simply short of food. They had no food. This is consonant with other facts on record about the onset of the famine.

D.—Disease takes precedence over starvation.

11. From about December onwards, there was a change in the clinical picture seen in famine hospitals. Most of the beds were filled with cases of malaria. The number of cases of famine oedema gradually diminished during the early months of 1944. Cases of acute starvation and extreme emaciation became relatively rare. Patients in general were thin and weak, and obviously required plenty of nourishing food to restore them to health. The majority were anaemic. There was, however, a genuine improvement in the state of nutrition. Cases of dysentery were frequent, but the "famine diarrhoea" which was so serious a problem in the earlier part of the famine, largely disappeared. Scabies a skin disease, became almost universal among destitutes in famine camps and hospitals. In many cases the greater part of the skin surface was involved in the lesions of scabies, complicated by impetigo and localised septic infection. The epidemic of scabies was probably due to various causes. In the first place, conditions of life among destitutes, *e.g.*, lack of clean clothing, lack of opportunity for washing, overcrowding or close contact in famine camps, etc., facilitated the transmission of the infecting agent. It has also been suggested that lack of oil for inunction of the skin was an important factor. Secondly, the unhealthy state of the skin itself, resulting from malnutrition, perhaps reduced its resistance to secondary infection. It is worth adding that healthy famine relief workers sometimes contracted scabies in the course of their work and that in general the disease in destitutes responded to the familiar treatment with sulphur ointment.

12. Another condition which was common in famine hospitals was "tropical ulcer" or "Naga sore", an ulcer of the skin and subcutaneous tissues usually situated in the anterior aspect of the lower part of the leg or the ankle. It usually begins with some slight wound or abrasion which refuses to heal. In

normal times tropical ulcer is common among plantation labourers who are in a poor state of nutrition and anaemic as a result of malaria and hookworm. Presumably malaria and malnutrition were responsible for its prevalence during the Bengal famine.

A good deal of Kala-azar was seen in the famine hospitals and some doctors think that its prevalence increased in 1944. There were a few cases of cancrum oris—a distressing condition in which tissues in the neighbourhood of the mouth putrefy and are destroyed. In the Russian famine of 1920, cancrum oris was widespread, but for some reason it was not common in the Bengal famine.

It was anticipated that with the onset of the cold weather there would be numerous deaths from pneumonia. This, however, did not occur; there was very little pneumonia. Again, eye-disease of various kinds often results from malnutrition and vitamin deficiency, but eye-disease was rare in patients in famine hospitals and out-patient clinics. The relative absence of vitamin deficiency disease has previously been mentioned. This again was contrary to expectation, since a high incidence of such disease had been prophesied as acute starvation gave place to more chronic malnutrition. In fact, the picture of disease in the Bengal famine failed in many respects to conform to the anticipations of doctors and nutrition experts.

E.—Epidemics

(i) Mortality.

13. Severe epidemics of malaria, small-pox and cholera were associated with the famine. The malaria season in Bengal normally extends from July to December. A severe and widespread epidemic, beginning in June, occurred during the latter half of 1943, reaching its peak in December and continuing in 1944. From July to December 1943, 479,039 deaths from malaria were recorded, an excess of 266,208 deaths (125·1 per cent) over the quinquennial average. In the first 6 months of 1944, malaria mortality figures were of the same order; 400,901 deaths were recorded, which was 223,664 deaths (126·1 per cent) above the average. Excess deaths from malaria accounted for 41·5 per cent of excess deaths in 1943 and 53·0 per cent of excess deaths from January to June 1944. In December 1943, the reported deaths from malaria were 202·6 per cent in excess of the quinquennial average.

14. Certain districts suffered more severely than others. The largest number of malaria deaths was recorded in Nadia, Murshidabad, Mymensingh, Faridpur, and Tipperah. As regards percentage increase over the quinquennial average, Howrah, Murshidabad, Dacca and Tipperah head the list. While in general mortality from malaria was exceptionally high in the admittedly deficit districts previously mentioned, the epidemic affected all districts in greater or lesser degree.

We realise that the figures of malaria mortality are likely to be inaccurate, and more inaccurate in 1943 than in 1944. For the certain diagnosis of malaria, which may be confused with other fevers, a blood examination is necessary and the proportion of cases in which this was done was of course infinitesimal. The figures, however, suffice to show that a most formidable epidemic of malaria was associated with the famine, and indicate its general course. Bengal is normally a very malarial province, having in fact the highest incidence of malaria of any province in India except the small province of Coorg. But no epidemic approaching in severity that of 1943-4 has occurred within its recent history.

15. There was no abnormal rise in mortality from cholera in the first half of 1943. The epidemic began in July and reached its peak in October—November. In Bengal, March and April are normally the months of highest prevalence. After November there was a gradual fall in cholera deaths, and by the

end of May 1944 they declined almost to the normal level. The total number of deaths from cholera reported from July 1943 to June 1944 was 218,269, that is, 309·7 per cent in excess of the quinquennial average for 1938-42. The whole of Bengal was involved in the cholera epidemic and there was no close correspondence between cholera mortality and general mortality. The greatest number of cholera deaths was reported in Mymensingh, Dinajpur, Bakarganj, Tipperah, and Noakhali.

16. As compared with malaria and cholera, small-pox was a relatively unimportant cause of mortality in 1943. Reported deaths numbered 22,005, the quinquennial average being 7,991. A severe epidemic, however, began in December 1943 and raged during the first half of 1944, reaching its peak in March and April. From June onwards it declined. During the months January to June 1944 the number of deaths from small-pox was 125,471, that is, 118,841 in excess of the average. Some 28 per cent of the excess mortality during this period is accounted for by deaths from small-pox.

(ii) The relation of famine to the epidemics:

17. A famine-stricken population is a sick population. Famine means not only lack of food in the quantitative sense but also lack of essential food constituents which are needed for bodily health. The functioning of every tissue and organ in the body is impaired by insufficiency of food. Susceptibility to infection may be increased, and resistance to disease when contracted will be reduced. Attacked by the same disease, an ill-nourished and debilitated individual is more likely to succumb than a healthy one. The former's response to treatment is likely to be unsatisfactory, and recovery, if recovery takes place, prolonged. The disorganization of life produced by famine furthers the spread of disease of various kinds, including the major epidemic diseases. We have estimated that there were some 1·5 million deaths in excess of the average in 1943 and the first half of 1944. It is impossible to separate these into groups and to assign a proportion to starvation and under-nutrition, another proportion to epidemic disease, and yet another to non-epidemic disease. The famine and its effects on the life of the people must be held generally responsible for the high excess mortality recorded under all the headings in the mortality tables.

18. The relation between epidemics and famine requires, however, more detailed discussion. The Commission was specifically asked to report on the causes and prevention of epidemics in famine. We must also inquire how far mortality in the Bengal famine could have been reduced by effective public health measures. The problem of famine disease and its prevention was discussed by the Famine Commission of 1901 whose views, given below, are worthy of close attention:

"Before we consider, as required by our instructions, 'in what manner the famine affected the death rate of the various provinces and districts' and enquire into 'the causes of any variation', it is necessary to explain our opinion of the connection with famine of the different diseases which commonly appear in its course, *viz.*, fever, cholera, dysentery and diarrhoea, and small-pox. The last is inconsiderable, and only so far connected with famine as vaccination falls into disuse owing to the engagement of the vaccinating staff on other duties. Dysentery and diarrhoea are peculiarly famine diseases, directly caused by insufficient and unwholesome food or by reduced powers of digestion and assimilation as the result of continued privation. Again, it is practically impossible to prevent the outbreak of cholera when large masses of men are collected together in the hot weather under famine conditions: but efficient organization and careful sanitary arrangements can stay the spread of the epidemic and when these precautions are not taken, a considerable share, at any rate, of the resultant mortality must be deemed to have been preventible. Of fevers it can

only be said that they often are in origin climatic, but that their fatality is owing to the reduced power of the people to resist them, largely due to famine."

19. The severe diarrhoea which complicated many cases of starvation is unquestionably a famine disease. Dysenteric organisms were found to be present in some 30 per cent of intestinal fluxes in destitute patients in Calcutta, but it must be remembered that a large percentage of the population is infected with such organisms in normal times. Even in infected cases, the condition of the intestines induced by starvation may have been an important etiological factor. Though its underlying pathology is at present obscure, "famine diarrhoea" may be regarded as a genuine clinical entity, and an important cause of mortality in the Bengal famine. It could have been prevented only by preventing the famine, and its effective treatment, in collapsed and emaciated cases, was extremely difficult.

20. The fatality rate of almost any serious disease is likely to be increased by undernutrition and starvation. We have, however, no satisfactory information about hospital fatality rates in the case of the major epidemic diseases during the famine. Lack of food may also facilitate the transmission of disease by increasing susceptibility to infection. In the case of small-pox, there is no evidence that this factor is operative. The epidemic during the famine can be ascribed to social disorganization which increased opportunities for contagion, and to the unprotected state of the population, that is, the insufficient proportion vaccinated. The small-pox epidemic could have been largely prevented by widespread vaccination in previous years and up to the time when it flared up.

21. As regards cholera, other factors may be involved in epidemics associated with food shortage and famine. In the conditions produced by the famine there was, of course, every opportunity for the pollution of water supplies and the spread of the disease through obvious channels of infection. But, apart from this, two possible causes may be mentioned. In the first place, food shortage and famine make people more careless about what they eat and drink, and opportunities for infection are thereby increased. Secondly, the acid secretion of the stomach tends to be diminished in people who are short of food. It has been suggested that while the healthy stomach with its normal secretions may act as a barrier against the cholera *vibrio*, which enters the body by the mouth, the stomach of an ill-fed individual provides a less effective "acid-barrier". This, however, is speculation and is not based on satisfactory scientific evidence.

We agree with the views of the 1901 Commission that much of the cholera mortality "must be deemed to have been preventible". Apart from the disinfection and purification of water supplies, public health workers have to-day at their disposal another weapon against cholera in the shape of cholera vaccine. A cholera epidemic can be checked, even in a famine-stricken population, by familiar sanitary methods and by the inoculation of vaccine on a wide scale. We shall inquire later whether the anti-cholera measures in the famine were in fact adequate and efficient.

22. The relation between malaria and famine is a more complicated problem. As regards fatality, medical witnesses told us that destitutes attacked by malaria often failed to respond to appropriate treatment and succumbed readily to the disease, while healthy people attacked by malaria in the same area recovered after treatment in the usual way. This would conform to the views of the 1901 Famine Commission and of earlier Famine Commissions on "fevers" and famine. Malaria is the most prevalent and lethal of the "fevers" both in normal and famine times in India. Fulminant epidemics of malaria have often been associated with food scarcity and famine. To give one example, in 1897, an epidemic of fever, occurring in famine districts in the Central Provinces, was the subject of a special inquiry. The theory was advanced that

the fever was of a "specially malignant type" but this was not supported by the majority of observers. "Almost all the medical officers employed agreed in holding that the fever was ordinary malaria fever, which, though it attacked all classes more or less, was specially fatal only in the case of those who had suffered from privation."[1]

Fever epidemics in typical Indian famines due to drought have followed a somewhat different course from malaria in the Bengal famine. They have tended to occur after the famine had been relieved, when the long delayed rains had arrived and the people were returning to their normal village occupations. During the height of a "drought famine", the parching of the land checks mosquito breeding. "The rainfall, which occurs after a few years of drought is often excessive, giving rise to floods, and this in itself usually creates circumstances favourable for the transmission of malaria. There are other epidemiological factors which may play a part in such outbreaks. The years of drought preceding an epidemic may so lower anopheline density and longevity that little or no malaria transmission takes place for several consecutive years. The absence of malaria transmission during such prolonged periods allows the immunity of the population to fall to a low level, especially in the younger children, many of whom may never have been exposed to malarial infection. In malaria epidemics, the mortality among children is often exceptionally severe and forms a high proportion of total mortality. Widespread destruction of cattle may result in the deviation of cattle-feeding anophelines to man"[2].

S. R. Christophers, in his investigations of the epidemiology of malaria in the Punjab, studied the relation between famine and the disease.[3] He noted that, of twelve great epidemics of malaria which devastated the Punjab in the latter half of the nineteenth century, seven followed seasons of famine or acute scarcity. Taking the price of food stuffs as an index of scarcity, he found a high correlation between scarcity and mortality from fever; the epidemics of 1870, 1872, 1878, 1879, 1881, 1887, 1890, 1892, 1900 and 1908 all occurred during periods of high prices. He found, however, an equally high correlation between famine and rainfall and concluded that "even if scarcity is in reality involved in epidemic causation, we should not expect to find it acting in the absence of the necessary factor of rainfall. We must not look for the effect of famine in this respect in the famine districts at the time of the famine, for at this time the essential factor, excess of rainfall, is absent". In the Punjab, years of scarcity or famine were usually followed by excessive rainfall and periods of high prices.

23. These observations do not throw much light on the epidemiology of malaria in the Bengal famine. In Bengal there was no preceding drought followed by heavy rains and indeed in the water-logged delta of Bengal climatic conditions can have little effect on the breeding of mosquitoes. Mosquitoes could thrive when the famine was at its height and the epidemic raged at this period. It is, however, significant that so experienced and distinguished a malariologist as Sir Rickart Christophers should have regarded food scarcity and famine as being possible factors in the genesis of severe malaria epidemics.

As in earlier famines, it has been suggested that the malaria which caused so many deaths in the Bengal famine was of an exceptionally virulent type. A stationary malaria-ridden population acquires some degree of immunity to the local strain or strains of malaria parasite. If a new strain is introduced

[1] Report of the Indian Famine Commission, 1898

[2] R. Passmore and T. Sommerville, Journal of the Malaria Institute of India 1940. 3,447.

[3] Proceedings of the Imperial Conference, Simla, 1909.

"Malaria in the Punjab".—Scientific Memoirs of the Goverment of India. No. 46.

immunity is weakened and the new strain may be highly virulent. In Bengal circumstances were propitious for the dissemination of unfamiliar strains; there was considerable migration of sections of the population in certain areas, and previous to the famine there had been an influx of refugees from Burma, many of whom were malarious and may have been the carriers of exotic strains. It is very difficult, from the evidence available, to reach a satisfactory conclusion on this point. We may, however, suggest that the high mortality rate from malaria can be largely accounted for without pre-supposing any change in the virulence of the infecting organisms. This opinion, tentatively expressed, is similar to that of previous Famine Commissions.

24. Malaria control in Bengal by the prevention of mosquito breeding or the destruction of adult mosquitoes is a formidable problem for which no solution has as yet been found. Anti-malarial measures of this nature were impossible during the famine. The only way of mitigating the epidemic was by supplying anti-malarial drugs in abundance and by treating as many patients as possible. The main responsibility of medical and public health authorities was to provide facilities for treatment. We shall revert to this question later, but it may be said at once that the responsibility was inadequately fulfilled.

25. An attempt has been made in the preceding paragraphs to discuss the relation between famine and epidemic diseases. The subject should not, however, be closed without reference to our present lack of knowledge of all the factors concerned in the rise and fall of epidemics and their interaction. The Croonian Lecture of Professor W. W. C. Topley entitled "The Biology of Epidemics", given before the Royal Society in 1941, brings out the complexity of the problem. It may be difficult to account satisfactorily for the cause and course of epidemics even in a well-fed static human population, even indeed, in a closed colony of experimental animals. To do so in the case of a socially disorganized famine-striken population is an impossible task.

CHAPTER III.—MEDICAL RELIEF AND PUBLIC HEALTH WORK

A.—Hospitals and Staff.

1. The steps taken by the Government of Bengal, with the assistance of the Government of India and the military medical authorities, to meet the grave medical and public health situation created by the famine will be briefly described. During the earliest months of the famine some use was made of the A.R.P. medical organization, which had at its disposal a certain number of beds in existing hospitals and emergency A.R.P. hospitals. In the middle of August 1943 arrangements were made for doctors to attend to destitutes collapsing in the streets of Calcutta from starvation, and to provide hospital accommodation for them. By the end of September, over 2,000 emergency beds had been opened in Calcutta and its suburbs for the treatment of sick destitutes, and medical staff was recruited for the emergency hospitals and wards. The A.R.P. medical organization in the city was pressed into service. During the same months orders were issued by Government to district authorities sanctioning the opening of emergency hospitals in such places and on such a scale as the emergency demanded. By January 1944 it was reported that some 13,000 beds were available and the number in July 1944 reached 18,250. These were provided largely by the construction of Relief Emergency Hospitals containing 100, 50 and 20 beds according to local necessity. In the early months of 1944 "satellite treatment centres" were opened in association with 1,400 dispensaries, for the treatment of patients in villages remote from dispensaries.

In November 1943 military medical resources were placed at the disposal of Bengal. Military hospitals, 16 in number and situated in various centres throughout the province, provided 2,100 beds and some 50 mobile military medical units were organized. The latter were subsequently replaced by civil units when the military personnel was withdrawn. Mobile units, staffed for the most part by medical students, were also organized by the Bengal Government. In February 1944, the number of such units was about 250, but this was later reduced to 80 owing to the return of the students to colleges.

2. Steps were taken to transfer district and subdivisional hospitals from the control of local authorities to that of the Provincial Government, in order to improve their efficiency. In June 1944, 11 hospitals had been taken over by the Provincial Government, 44 were on the point of being taken over and negotiations for the transfer of the remainder were in progress.

3. The Director General, Indian Medical Service, visited Bengal during the first week of September, 1943, and made arrangements for the distribution of milk through the Indian Red Cross Society; an appeal for funds for this purpose was made in the same week by the Viceroy. At a meeting of the Nutrition Advisory Committee, Indian Research Fund Association, held in Delhi on October 1st and 2nd, 1943, the famine in Bengal was discussed and immediate arrangements made to establish a research unit in Calcutta to study methods of treating cases of starvation and famine disease. Early in October there were consultations in Delhi between the Minister for Public Health and Local Self-Government, Bengal, and the Department of Education, Health and Lands, Government of India, about the health and medical requirements of Bengal, and efforts were made by the latter to obtain doctors and nurses for famine work. The Director-General, I.M.S., newly appointed in October, and the Public Health Commissioner with the Government of India arrived in Bengal in the first week of November 1943 to advise and assist in the organization of medical relief and public health measures. Other visiting experts during 1943

included the Director of Medical Services in the Army, the Director, Malaria Institute of India, and the Director of Nutrition Research.

4. In November 1943 an I.M.S. officer was made available to the Bengal Government for the post of Director of Public Health to replace, in the interests of efficiency, the provincial service officer previously employed. Seven I.M.S. officers were released from military service, and returned to Bengal for duty at various dates during the first half of 1944. They were mostly employed as Civil Surgeons. The military authorities, in November 1943, lent the services of one Assistant Director of Hygiene, 10 Deputy Assistant Directors of Hygiene, and 56 medical officers for employment as health officers in sub-divisions. A senior officer was appointed as Medical Adviser for Famine Relief. The Assistant Director of Hygiene was concerned with general supervision, the Deputy Assistant Directors of Hygiene assumed the duties of Assistant Directors of Public Health in various parts of the province, and the medical officers were employed as health officers in sub-divisions. The duties of the additional health staff included the improvement of village sanitation and disinfection of water supplies, the carrying out of inoculations and vaccinations, the treatment of malaria cases, and the supervision of the work of the subordinate public health staff. They were also instructed to ensure the prompt reporting of vital statistics to the Director of Public Health. Before they proceeded to the districts the officers were given a brief course of instruction at the Health Unit in Singur, an organization attached to the All-India Institute of Hygiene and Public Health.

At the end of May 1944 it became necessary, owing to military requirements, to withdraw part of this staff, but two Deputy Assistant Directors of Hygiene and 40 military sub-divisional officers were left with the Government of Bengal to give time for arrangements to be made to replace them.

5. There was great difficulty in obtaining enough civilian medical officers of satisfactory calibre to meet the emergency. Other provinces were approached to supply medical officers, but since the medical cadres of all provinces had been depleted by the release of medical officers for service with the army, little help was forthcoming. The Central Provinces provided 2 medical officers, and the Government of Burma lent the services of 27 doctors who were in India awaiting the reconquest of Burma and return to their own duties. The attempts of the Government of Bengal to recruit medical officers within the province were far from successful. It was found that doctors were reluctant to serve in rural areas under the conditions produced by the famine, and moreover the pay offered was not attractive enough. There was a general increase in sickness among well-to-do people who could afford to pay for medical treatment and hence good money to be made in private practice. Up to February 1944 some 160 doctors—a quite insufficient number—were recruited. At the instance of the Government of India rates of pay were increased in March, 1944, and by the end of June 328 doctors had been obtained for famine medical work. This was about half the number which the Government of Bengal estimated to be necessary.

6. There is a great shortage of nurses in India in normal times, the reasons for which need not be discussed here. In the whole country there are only some 7,000 trained nurses, which works out as one nurse for every 56,000 of the population. A large proportion of these are at present serving with the army. During the famine the problem of obtaining additional nurses was insoluble. Neither Provincial Governments nor missionary organizations were able to help. The only way to meet the emergency was to obtain untrained male and female attendants, put them in hospitals and hope that they would learn something about nursing from the instructions of the doctors and practical experience. Clearly such attendants cannot be described as nurses in the

usual sense of the term. The medical work of famine hospitals was handicapped throughout by the lack of satisfactory nursing staff.

7. The sweeper is a functionary of vital importance in Indian hospitals, performing the essential tasks delegated to him by the customs of the country. His services were of particular importance in emergency hospitals without sanitary appliances or drainage. Great difficulty was encountered in obtaining sweepers for the famine hospitals. There was a shortage of sweepers in Bengal owing to the demands of the military and the swollen population of Calcutta. Two hundred sweepers were recruited in the United Provinces—a number altogether insufficient to meet requirements. Although their pay was nearly double that of Bengali sweepers, and the difference led to discontent among the latter, some of the U. P. sweepers deserted after brief service. In the early months of the famine, when many patients were suffering from diarrhoea and beds and wards were continually befouled, the shortage of sweepers was almost as great an obstacle to the efficient running of hospitals as the shortage of doctors and nurses. The problem remained unsolved throughout the famine.

B.—Medical Supplies.

8. The lethal epidemic of malaria made quinine preparations and substitutes the most important of all drugs during the emergency. In peace time the normal consumption of quinine in India is about 200,000 lbs. In 1943 some 79,000 lbs. of quinine and 20,000 lbs. of cinchona febrifuge were allotted to Bengal. In 1944, 65,000 lbs. of quinine, 30,000 lbs. of cinchona febrifuge, 500,000 quinine ampoules and 382 million tablets of mepacrine and quinacrine were supplied to the province. The latter are recently introduced synthetic preparations, resembling the German preparation "atebrin". Mepacrine has been widely and successfully used by the army in the Burma campaign. Large amounts of anti-malarial drugs were in fact supplied to Bengal during the famine and the epidemic of malaria which continued throughout 1944, the cost of those distributed free in 1944 being no less than Rs. 21,00,000.

9. One million sulphaguanidine tablets were sent from the United Kingdom under arrangements made by the Secretary of State. The main use of sulphaguanidine tablets is in the treatment of bacillary dysentery. The effect of this drug on cholera is at present under investigation.

10. The following supplies of vitamin tablets and preparations were obtained: one million compound vitamin capsules from army stocks; 50,000 vitamin B1 tablets from local stocks; one million vitamin B1 tablets and one million halibut oil capsules by air from the United Kingdom, the despatch being arranged by the Secretary of State: one million halibut liver oil capsules presented by Boots Pure Drug Co.; 700 gallons of shark liver oil from supplies in India. In the second half of 1944 a further supply of 2,900,000 composite vitamin B tablets was expected from England.

11. The civil emergency hospitals, mobile units, etc., had to be supplied with drugs, blankets, sheets, disinfectants and other necessary articles. This was the responsibility of the Government of Bengal. The military units which came into action at the end of 1943 were fully equipped, but equipment for the expansion of certain military hospitals was later provided by the Government of Bengal. Additional drugs were also supplied by the civil authorities to medical units after the initial stage. Food supplies for military hospitals were a civil responsibility.

Existing hospitals in Bengal were in general poorly equipped and there was a deficiency in the province of most medical supplies, so that there was little to build on in the task of creating hospital accommodation. After November 1943 the problem of medical relief was taken up in earnest, and by degrees the supplies required by the hospitals were obtained and

distributed—no easy task under war conditions. Needless to say, the standard of equipment of the emergency hospitals was not high, but in general it sufficed for the care and treatment of destitutes. The Government of India made available in November 1943 the services of the officer in charge of the Calcutta Medical Store Depot, his duties being to advise on the procurement of medical supplies, and to assist in their storage and distribution, pending the completion of satisfactory provincial arrangements for these purposes by the Government of Bengal. A Centre Store Depot was opened by the Government of Bengal in May 1944. The military undertook the distribution of medical supplies, and after their withdrawal in April 1944 fresh difficulties were encountered. In May the Government of Bengal reported that medical supplies were adequate but that there was a breakdown in the distribution arrangements in some areas.

C —Anti-epidemic measures.

12. The number of vaccinations against small-pox and inoculations against cholera carried out monthly from July 1943 to May 1944 is shown below. The figures are those of the Director of Public Health.

1943	Vaccinations	Inoculations
July	114,167	721,615
August	84,167	609,306
September	71,224	568,142
October	72,781	762,019
November	167,160	610,367
December	463,738	610,854
Total for July—December 1943	973,237	3,882,303

1944	Vaccinations	Inoculations
January	1,776,166	945,436
February	3,335,542	1,141,880
March	5,139,101	2,605,882
April	7,303,137	4,339,636
May	5,700,030	2,595,186
Total for January—May 1944	23,253,976	11,628,020

By the end of May, 1944, according to these figures, over a third of the population had been inoculated against small-pox and about one-fifth against cholera. It was one of the duties of military and civil medical officers employed in famine relief to carry out inoculations and vaccinations. After very considerable delay, some 1,000 sanitary assistants were recruited by the Government of Bengal for this purpose. By October 1944 the number of inoculations and vaccinations reported had reached 18 and 32 millions respectively.

13. Bleaching powder is essential in combating epidemics of cholera. It is needed to disinfect clothing, the houses in which cholera occurs, and water supplies. Bleaching powder has been in short supply in India during the war and early in the war was placed under the control of an officer of the Government of India, the Controller of Heavy Chemicals. Supplies required by Provincial Governments, local bodies, etc., could be obtained only by application to this officer. In the emergency in Bengal this proved a cumbrous procedure, and indeed in the early months of the cholera epidemic little attempt was made by the Government or local bodies in Bengal to secure the necessary bleaching

powder. In November, 1943, at the instance of the Public Health Commissioner, the Controller of Heavy Chemicals placed 50 tons at the disposal of the Director of Public Health.

14. The water used for domestic purposes in rural Bengal comes from tube wells, tanks and rivers. Cholera is readily spread by infected tank and river water. Tube wells, when in proper order, provide a safe source of water supply and do not require treatment in a cholera epidemic. Unfortunately a large proportion of the tube wells in Bengal—one estimate given to the Commission was one-third—were out of order. The sinking, maintenance and repair of these wells are the responsibility of the District and Union Boards, the necessary funds being supplied partly from their own resources and partly from Government grants. Owing to the war the price of the materials required for tube wells has risen steeply and local Bodies, with the limited funds at their disposal, were unable to keep the wells in a satisfactory state. It may be added that there is no regular system for the inspection and repair of tube wells, and no capable engineering staff, and the state of the wells under the local bodies may be ascribed as much to indifference and inefficiency as to lack of money.

15. The severe cholera epidemic made the repair of tube wells a matter of urgent public health importance. The deficiency of wells in proper working order naturally increased the use of tank and river water and thus facilitated cholera infection. In November 1943 the Government drew the attention of all District Boards to the vital need of ensuring uncontaminated water supplies and called for information about the numbers of derelict tube wells and the quantities of materials required to put them in order. The practical results of this step were negligible. In January 1944 the Government sanctioned the expenditure of 1,500,000 rupees for the repair and maintenance of tube wells. Owing, however, to difficulties in obtaining materials and transport, and other causes suggested above, work on tube wells did not begin until two months later. By August 1944 some 10,000 tube wells had been repaired in the various ways needed to make them serviceable and a source of safe water supply.

D.—Distribution of Food

16. In famine food is the most important medicine and hence a reference to the provision of food to famine victims will not be out of place in this section of our report. During the second half of 1943, from August and September onwards, a large number of kitchens for the free distribution of cooked food were opened throughout Bengal. The number reached 6,625 in the beginning of November and it was reckoned that during this month about 2·1 million people were being fed daily. According to figures supplied by the Government of Bengal, some 110,000,000 free meals were provided; this includes meals supplied after the Midnapore cyclone in October 1942. Free kitchens were also set up by charitable agencies, in both Calcutta and the mofussil, with the emphasis strongly on Calcutta, where distress was most evident to the well-to-do and voluntary relief workers easily obtainable. Nearly half the kitchens in Calcutta were run by charitable organizations.

17. Doles of uncooked food were given on a wide scale in the districts, the number of recipients reaching 257,000 in November 1943. Apart from free doles, foodgrains were sold at cheap rates to the poorest sections of the community. During the period of greatest distress, 1,801 cheap grain shops were selling foodgrains to about 492,000 families, *i.e.*, over two million people. There were also canteens selling cooked food at a cheap rate and it was reckoned that 120,000 people took advantage of them over a long period.

18. The quantities of food supplied as free doles of uncooked grains or in the form of gruel at the kitchens were very meagre. In a circular issued by

the Government of Bengal on August 20th, 1943, the following scale was laid down:—

Gratuitous relief—

(a) *Free gruel at 2 chataks (4 oz.) of foodgrains per head.*

(b) *Uncooked foodgrain doles per head per day.*

(i) 4 *chatacks* (8 *oz.*) *for adults who normally do manual work.*

(ii) 3 *chatacks* (6 *oz.*) *for other adults, and*

(iii) 2 *chatacks* (4 *oz.*) *for minors aged* 2-14.

It was added that "expectant and nursing mothers and if possible growing children should be given 50 per cent. more than the above, preferably as a second meal". In Calcutta foodgrains for gruel kitchens were provided by the Department of Civil Supplies, which put a Relief Control Officer in charge of the kitchens. In a note dated August 28th the Department of Civil Supplies prescribed a rate of 3 *chatacks* (6 oz.) of foodgrains *per capita* daily.

In September, when the supply position had somewhat improved, it was decided to increase the quantities of food given as gruel and doles. A correction slip to the original instructions was issued on September 21st, by which the quantity of grains in the gruel was raised to 8 oz., while the allowances of uncooked grains for classes (i), (ii) and (iii) became 12, 8 and 4 oz. respectively. Government did not receive any reports from District Officers expressing their inability to introduce the new allowances for want of adequate supplies and presumably these were issued without delay throughout the districts.

The gruel supplied in the kitchens usually consisted of a mixture of grains in which millets predominated. In Calcutta equal quantities of rice, *bajra*, *jowar* and *dhal* were included. Some of the charitable organizations supplied more rice in the gruel when they could obtain it. Small quantities of other ingredients such as vegetables, spices and sugar were also usually added to the mixture. The gruel as issued did not at the best supply more than 600—800 calories for adults and about half this number for children. The millets, notably *bajra*, were unfamiliar and unpalatable food and it was widely stated that they were so indigestible that they produced intestinal irritation, diarrhoea and death in numerous destitutes.

19. Towards the end of 1943, the gruel kitchens were gradually closed down and the feeding of destitutes in poor houses, homes, orphanages, etc., assumed importance. The scales of diet varied from district to district. In some places they were reasonably generous; for example, in the Contai sub-division of Midnapore a scale for destitute homes was introduced in December 1943, providing for an adult 16 oz. of cereals and 4 oz. of *dhal*, the whole diet yielding more than 2,000 calories. In April 1944 the question of diet scales was taken up by Government. It was found on investigation that the calorie value of the diet in relief institutions was in general much below requirements and the Public Health Department recommended the following generous scale:—

For Adults

Rice or rice and wheat	16 ounces=1 lb. (wheat not to exceed 8 oz.
Pulses (*Dhal*)	3 ounces.
Non-leafy vegetables (Potato, Turnip, Brinjal, etc.)	6 ounces.
Leafy vegetables (cabbage, *sag*, amaranth, etc.)	2 ounces
Fat and oil	2 ounces.
Salt and condiment	In sufficient quantity.
Fish	2 ounces. (If not possibel every day, at least every other day.)

Children below 12 years should get milk as available according to the following scale in addition to a proportionate amount of an adult's diet :—

For ages 2—5	12 to 16 ounces.
For ages 6—12	16 to 20 ounces.

Pregnant and lactating mothers should get over 12 to 16 ounces milk daily in addition to an adult's diet.

E.—Hospital Feeding

20. It has been remarked that in hospitals the provision of a good diet was a vital part of treatment. The dietary treatment of cases of acute starvation is a difficult problem which was studied by research workers in Calcutta. Recommendations based on these findings were passed on to hospitals throughout the province. It was observed that starved patients not infrequently refused the fluid diet appropriate to their condition and begged for a large meal of rice. When this was refused they sometimes absconded. Alexander Porter reports similar occurrences in the Madras famine of 1877-8.

21. The ordinary hospital diet provided for debilitated patients in famine wards and hospitals was by no means perfect from the standpoint of nutrition, but the condition of patients consuming it usually improved and they put on weight. The standard of diet was not uniform in all hospitals and places. There were difficulties of supply and some doctors in charge of famine hospitals made little effort to overcome those and provide the best diet possible in the circumstances. But on the whole the famine hospital diets were not unsatisfactory.

F.—Milk

22. The distribution of evaporated and dried milk was undertaken by the Indian Red Cross Society. At the beginning of September 1943, the army handed over 200 tons of milk to the Society, and with this supply distribution was begun in Calcutta and the districts. Subsequently, generous consignments were received from abroad, notably from the United States. By September 1944 some 1,850 tons of processed milk had been supplied to Bengal. Distribution was carefully organized and the milk reached those who were most in need. It was given largely to infants, young children up to 10 years and expectant and nursing mothers at gruel kitchens, and in hospitals, destitute homes, famine camps and orphanages.

At the kitchens it proved invaluable for children who were too ill to take the gruel. A rigid rule was made that the milk must be consumed at the kitchen itself, in order to avoid the possibility of its being sold by recipients. Relief workers in general were struck by the improvement in under-nourished destitute children which took place when they were given milk for a few weeks.

23. Transport of milk supplies from Calcutta to the districts presented considerable difficulties in the early months of the famine. These were alleviated when military transport became available for relief work. Hundreds of tons of milk were transported to outlying places with speed and reliability. We record with pleasure that at one point the United States Air Force co-operated by flying some tons of milk to Dacca, in response to an urgent call from the District Magistrate. To facilitate distribution in the districts the Indian Red Cross Society in 1944 appointed 18 paid agents. This arrangement was found to be more satisfactory than entrusting distribution to District Magistrates, overburdened by other work.

24. The quantities of evaporated and dried milk distributed in Bengal monthly from September 1943 to June 1944 were as follows:—

	Calcutta	*Mofussil*	*To the Surgeon-General for hospitals*
	Tons	Tons	Tons
1943—September	15	33	..
October	15	56·75	..
November	15	68	..
December	10	120·5	..
1944—January	10	125·5	50
February	10	122·5	25
March	10	121·5	25
April	11	121·5	17
May	11·5	208	17
June	11·5	157	25

CHAPTER IV.—THE FAILURE TO PREVENT HIGH MORTALITY

1. An objective account has been given of the measures taken to provide medical relief, check epidemics and supply food to the famine-stricken population. They are by no means unimpressive, at least as regards their scale. A very considerable effort was made by the Bengal Government to succour the millions of people affected by famine and disease. But clearly the various measures taken were on the whole unsuccessful, since the excess mortality according to our estimate may have reached 1·5 millions. The causes of the failure must now be critically examined.

A.—Famine and health services in general

2. In the story of the events leading up to the famine it has repeatedly been pointed out that only action, taken before a certain stage in the descent into catastrophe was reached, could have fully retrieved the situation. This is equally true in the health sphere. Once the position as it existed in August and September 1943 had developed, with some millions of people starving, socially disorganized and already a prey to epidemic disease, no health service, however well-staffed and organized, could have prevented heavy mortality.

We must, however, inquire whether, at the various stages of the famine, it would not have been possible to reduce mortality by more effective health measures.

B.—Previous defects in the Public Health Organization

3. If a public health organization is to be capable of meeting emergencies, it must reach a certain degree of efficiency in normal times. In Bengal the public health services were insufficient to meet the normal needs of the population and the level of efficiency was low. The same can of course be said of public health organizations in all parts of India, but that in Bengal was below the standard of certain other provinces. The Department of Public Health and Local Self-Government (Medical) under the charge of a Minister, is responsible for public health. At the centre there is a Director of Public Health, who at the time of the famine was an officer recruited from the Provincial Service. (The post is not a "reserved" I.M.S. post, though it may and has been filled by I.M.S. officers). The provincial health department includes 6 Assistant Directors of Public Health, 2 concerned with school hygiene and malaria research respectively and 4 for superintending public health work in the 4 Divisions.[1] Previous to the famine, three special Assistant Directors had been recruited, two for work in subdivisions of the Midnapore district badly affected by the cyclone, and one for public health work connected with A.R.P. and Civil Defence. In the malaria section there are an engineer, an entomologist and a qualified assistant. Other officers in the provincial health department include the Director of the Public Health Laboratory, the Superintendents respectively of the Bengal Vaccine Laboratory (for cholera vaccine), the Bengal Vaccine Institute (for small-pox vaccine), Maternity and Child Welfare, and Vital Statistics, and an Inspector of Septic Tank Installations. In numbers the provincial health services were at about their usual strength in 1943. A post of assistant malariologist was unfilled and there were two vacancies for epidemiologists.

4. Public health work in the districts is the responsibility of the District Boards. In each district there is a District Health Officer, half of whose salary is paid by Government, but who is actually a servant of the District Board.

[1]The Burdwan Division, the Presidency Division, the Rajshahi Division and the Dacca and Chittagong Division.

Subordinate health workers in the districts are also servants of the local Body. The health organization in rural Bengal in general may be illustrated by describing the organization in a typical district—Dacca. The population of Dacca is some 4·5 millions and its area 2,738 square miles. There is a District Health Officer at district headquarters on a salary grade of Rs. 300—20—500 per month, the present holder of the post having reached his maximum salary in 1932. The district is divided into 32 health circles, the population of which varies from 60,000 to 250,000 and the area from 36 to 174 square miles. In each health circle there are 3 subordinate health workers, *viz.*, a sanitary inspector, a health assistant and a medicine carrier. In addition some 100 vaccinators are appointed temporarily for about 6 months in the year. The pay of the sanitary inspectors is Rs. 50—5—70 per month, with a travelling allowance of Rs. 15, house allowance of Rs. 3, and office allowance of Rs. 3. The health assistants are not on a salary grade, their pay being fixed at Rs. 22 per month with Rs. 5 travelling allowance and Rs. 2 house allowance. The medicine carriers receive Rs. 17 per month, while the vaccinators get from Rs. 12 to Rs. 20 according to their experience, during the period of their employment. This is the normal organization, without reference to additional staff employed during the famine.

5. Clearly one sanitary inspector, even with the help of a health assistant, a medicine carrier and a few temporarily employed vaccinators, cannot deal adequately with the health problems of a population which may exceed 200,000 and inhabit an area of over 150 square miles. Further, touring in rural Bengal is in general slow and not infrequently interrupted during the rains. This makes the work of the local health staff more difficult and also reduces the amount of supervision which can be exercised over their work by the District Health Officer.

6. In addition to inadequate staff, there were other defects in the health organization in Bengal which were repeatedly brought to the attention of the Commission. Steps have since been taken to remedy a few of these, but the use of the past tense in the paragraphs which follow does not imply that much reform has as yet been carried out. Since the district health staff was in the employ of the local Bodies, the Director of Public Health had no disciplinary control over them and no powers of selection or transfer. He could not dismiss or transfer a lazy and inefficient health officer. In the case of an emergency he had no powers to mobilize the limited resources of health personnel in the province. He could indeed give technical advice, but advice might not result in action. When epidemics occur, swift and drastic action is necessary. No general could conduct a campaign without full control of the forces at his disposal.

7. The pay and prospects of District Health Officers were not conducive to efficiency. They usually remained throughout their entire careers in the districts to which they were first appointed, having reached the maximum grade of salary long before retirement. Transfer from one district to another never occurred, so that the refreshment brought about by changes in work and environment was absent. Senior appointments to which District Health Officers could aspire in the provincial health department were few in number. Professional contacts were lacking and the officers fell out of touch with recent developments in the field of public health. The result was that they tended to get into a rut and lose the enthusiasm necessary for successful work in the health sphere.

8. The pay of subordinate members of the service was insufficient and had not been adjusted in accordance with the rise in the cost of living. Financial allotments for travelling on the part of all the staff were often inadequate. In view of the large areas to be covered, it was particularly important that District Health Officers and their subordinate staff should have adequate facilities for touring. In one district, the Commission was informed that no travelling allowance had been paid for 15 months previous to the famine. The part-time

vaccinators were very poorly paid and were forced to do other work in order to live. In the circumstances lack of drive and limited achievement on the part of the rural health services were only to be expected.

8. Another factor of importance was the position of the district health personnel as employees of the local elected bodies. Such bodies are often swayed by party politics and technical officers in their employ tend to get drawn into the political sphere. The Commission learnt of instances in which District Health Officers and the subordinate health staff were employed in activities other than public health, including political activities. The District Health Officer was often at the beck and call of the Chairman of the District Board. It has been claimed that District Boards are likely to understand local needs better than Government experts. This may be true as regards some of the responsibilities of District Boards, but it is not true as regards public health. The general public has not yet become "health conscious". Hence it was difficult or impossible for local elected bodies to understand the modern public health movement and its requirements and obligations.

C.—Vital Statistics

9. Reference has already been made to the inaccuracy of vital statistics in Bengal as elsewhere in India. Another point of importance in connection with the famine was the delay in their compilation. Under the system operative in 1943, the village *chowkidar* sent his mortality report to the Union Board office. The President of the Union Board was responsible for collecting the figures from the various villages in the Union and forwarding them to *thana* headquarters, where they were collated by the sanitary inspector and in due course sent to the District Health Officer. In some districts they were sent to Sub-Divisional Officers and not to sanitary inspectors. In 1943 the Director of Public Health had two offices, one in Calcutta at which he himself worked, and another in Rajshahi which housed his statistical staff. Part of the public health staff was removed to Rajshahi from Calcutta in 1942 as an A. R. P. measure. The result was that it took many months for the health expert of the Provincial Government to receive information about the trend of mortality in the districts. The usual period was 3 to 6 months; in the case of certain districts, considerably longer. In November 1943 no figures for total deaths in 5 districts later than December 1942 were available in the office of the Director of Public Health. The latest completed figures for any district were those of April 1943. The reporting of outbreaks of certain epidemic diseases was somewhat more rapid. When the President of the Union Board was informed by the village *chowkidar* of an outbreak of small-pox or cholera, he sent on the information by postcard to the sanitary inspector at *thana* headquarters, who sent it to the District Health Officer, who sent it to the Director of Public Health.

In such circumstances it was impossible for the Director of Public Health to maintain vigilant watch over the health of the population and to give timely warning of deterioration and the need for urgent action. A health department in such a position is seriously handicapped when an emergency arises.

The most serious block in the sluggish channel by which mortality records reached the Director of Public Health was at the Union Board offices. In January 1944 an attempt was made to hasten the flow by removing the obstruction and making sanitary inspectors responsible for collecting figures from *chowkidars*. This produced some acceleration, which was not however uniform throughout the province, since many delays still occurred in certain districts.

D.—Previous Defects in Hospital Services

10. Curative medicine in Bengal suffered from much the same disabilities as preventive medicine. Nearly all hospitals and dispensaries in the districts

were financed by local bodies; only in Dacca was there a large hospital supported out of provincial revenues. The Surgeon General, an I.M.S. officer, is in general responsible for curative medicine throughout the province. In each district there is a Civil Surgeon, who is a Government officer and appointed by the Government on the advice of the Surgeon-General. Assistant Surgeons in charge of Sub-Divisional hospitals are also on the provincial cadre while sub-assistant surgeons in charge of small hospitals and dispensaries in the rural areas are employed by local bodies. Before the war some of the Civil Surgeons in Bengal were I.M.S. officers, but during the war the large majority of these were withdrawn for military service. Their places were taken by officers in the Bengal Medical Service, usually promoted Assistant Surgeons. A number of Indian Medical Department medical officers had also reverted to military duty, their posts being filled by provincial service officers. The total strength of all grades of the medical services in July 1943 was 425 against a sanctioned strength of 510, a shortage of 85. The number of Bengal Medical Service (Upper) officers was 125 compared with a sanctioned strength of 166, while the corresponding figures for the Bengal Medical Service (Lower) were 255 and 273 respectively. Recruitment to full strength in both grades previous to famine was delayed by a decision to employ only officers above military age, and also, in the case of the senior grade, by questions relating to the communal distribution of posts. In November 1943 the order restricting recruitment to candidates over military age was withdrawn. It may be observed that the Bengal Medical Services generally had not been very seriously depleted, except as regards I. M. S. and I. M. D. officers. Recruitment from the Bengal Medical Services into the army had not been extensive.

11. While the Surgeon-General was nominally in control of Civil Surgeons and Assistant Surgeons, disciplinary action against an inefficient and disobedient officer could be taken only through Government and was a lengthy process. Civil Surgeons in turn had little power of control over the subordinate medical staff in the district, which looked to local bodies for orders and policy. According to the usual procedure, all additional expenditure on the part of the Provincial Government had to be sanctioned by the Finance Department. Delay in administrative procedure which may have been of relatively little significance in normal times proved serious in the famine emergency. The financing of hospitals throughout the districts was the responsibility of local Bodies. The general organization of the medical services and hospitals was in fact such as to render mobilization and development to meet the emergency extremely difficult.

12. In the opening months of the famine Civil Surgeons in general were not aware of, or at least did not report, the development of a critical situation in their districts. Their lack of knowledge of what was happening appears to have been partly due to inability or disinclination to tour their districts. There seems to have been lack of contact and co-ordination between Civil Surgeons and District Magistrates in certain districts with regard to the medical emergency created by the famine. The Surgeon-General stated in evidence that the medical authorities at provincial headquarters did not become aware of the existence of unusual conditions until August 1943, when sick destitutes began to throng the streets of Calcutta.

13. In general the standard of efficiency reached by Civil Surgeons and subordinate medical personnel left much to be desired. Discipline and sense of duty were defective and morale low. This is in comparison, not with an ideal standard, but with standards in certain other provinces in India. Many of the Civil Surgeons had obtained their appointments at a late stage in their careers after years of service in a subordinate position. Hence they were not suited to take vigorous initiative when initiative was required. The hospitals throughout Bengal, with certain exceptions, were poorly equipped and badly run.

Representatives of the District Boards who appeared before the Commission ascribed the inefficiency of the rural public health and medical services to financial stringency. The income of District Boards has not increased *pari passu* with the increasing demand for expenditure on roads, water supply, public health services, hospitals, etc. Their powers of taxation are limited and they depend largely on grants from the provincial revenues. The Provincial Government themselves suffered severely from financial stringency for many years and were not able to provide adequate funds for public health and medical purposes. There can be no doubt that lack of money, both from provincial and local revenues, was a serious obstacle to the development and maintenance of public health services and the provision of well-equipped hospitals, but this does not excuse the state of affairs revealed in 1943 when the health and medical services were called upon to deal with the famine emergency.

E.—The Famine Period

14. In view of the state of medical and public health organizations in Bengal before the famine, it is scarcely surprising that they failed to rise to the occasion. On the health side, no satisfactory attempt was made during the early months to deal with the situation; there was in fact almost a complete breakdown of health services, affecting both the centre and the periphery.

15. **Cholera.**—At this time the need for the inoculation of cholera vaccine on a wide scale was urgent. The Bengal Vaccine Institute normally produces 500,000 doses of cholera vaccine per month, and abundant supplies of cholera vaccine, amounting to 12·5 million doses, were available in India as a whole. In spite of this, adequate quantities of vaccine were not available in the districts throughout the critical months of 1943, and in general cholera preventive work during this period was unsatisfactory. At the end of the year, with the help and stimulus of the military medical organization, the anti-cholera campaign by means of inoculation on a large scale was begun in earnest. It was prosecuted with vigour throughout the first half of 1944, during which period the epidemic was brought under control.

The repair of tube wells, urgently recommended by Government to local Bodies in November 1943, was not begun until many months later when the cholera epidemic had waned. While due weight must be given to the difficulty of obtaining labour and materials, the long delay reflects little credit on the engineering section of the Public Health Department and the local authorities concerned.

16. **Small-pox.**—As regards small-pox, no widespread epidemic, calling for urgent action occurred in 1943. The chief failure was the insufficient number of vaccinations carried out previous to the famine, which meant that the population was inadequately protected against an epidemic of small-pox. Reference must, however, be made to the delay in appointing additional workers for carrying out vaccinations and other public health work. In August, 1943, the Director of Public Health put forward a proposal to Government for the recruitment of 40 doctors and 10 sanitary inspectors for anti-epidemic work. Nothing resulted. In November, plans were formulated for dealing with health problems on a wider scale. It was decided, in view of the difficulty in obtaining qualified doctors and trained sanitary assistants, to engage untrained matriculates and give them a brief course of training. After some unnecessary delay due to an attempt to adhere to the communal ratio in selection, these were recruited and trained and by January 1944, 736 were at work in the districts.

17. During 1944 the vaccination of the population was pushed forward with great energy. One witness remarked to the Commission that the achievement represented by the vaccination figures could scarcely be equalled in any country in the world, even in Russia. It must, however, be noted that the

small-pox epidemic was not brought under control until June 1944. This may be accounted for in various ways. Most important is the low percentage of the population vaccinated when the epidemic began. Mention must, however, be made of the possibility that some of the lymph used had lost its potency. Until the beginning of the epidemic most of the lymph used was prepared in Bengal; later lymph was obtained from all over India to supplement local supplies. Lymph has a short active life. Again, the technique of vaccination may have been to some extent faulty; the unqualified workers recruited by Government received only a brief training. Another obvious possibility is that the workers engaged in vaccination did not in fact carry out all the vaccinations entered in their returns. Care was, however, taken by military and other medical authorities to check the accuracy of their records and little or no evidence of wilfull exaggeration was detected. It must of course be borne in mind that there was no segregation of small-pox cases and abundant opportunities existed for contagion in the prevailing social circumstances.

The vaccination campaign was unquestionably a most praiseworthy effort on the part of the military and civil public health organization. There was at first considerable resistance on the part of the public to vaccination and inoculation. One military officer engaged in the task was assaulted. Sometimes men would allow themselves to be inoculated or vaccinated, but would object to their womenfolk receiving the same treatment. Much tact and ingenuity were applied to bring home the necessity for protection against disease before its appearance. Public meetings were held in *thanas* and conferences with local influential officials arranged. Vaccinations and inoculations were often given at centres for more popular relief measures, *e.g.*, the distribution of food or clothing. Roads leading to markets were picketed and wayfarers induced to accept preventive treatment. By degrees prejudice was dispelled and people learnt to submit willingly to the procedure.

18. The military sub-divisional health officers played an important part in this as in other forms of health work. They superintended the work of the subordinate health staff and stimulated the latter to unwonted activity. They occupied, in fact, a pivotal position in the emergency health organization. We shall refer later to the permanent need for sub-divisional health officers as part of the health services of the province.

19. **Quinine.**—The distribution of anti-malarial drugs was thoroughly unsatisfactory. Previous to the Japanese war supplies of quinine needed by hospitals and dispensaries were purchased from Government by the local bodies concerned, and quinine for private patients was obtained through ordinary commercial channels. The conquest of Java cut off the main source of world supplies of quinine. Accordingly it became necessary to ration quinine in the various provinces and regulate its distribution. In Bengal, the Director of Public Health was responsible for the distribution of quinine to the districts, while District Magistrates were in charge of distribution within the district.

In 1943, reasonably good supplies were available with the Government of Bengal, but a large proportion of these failed to reach the districts. The officer who was Director of Public Health up to November 1943 stated in evidence before the Commission that demands for extra quinine were not received from the District Magistrates, and accordingly additional supplies were not sent. Within the districts quinine was not satisfactorily distributed and was found to be in short supply as the malaria epidemic rose to its peak in the later months of the year. One difficulty with regard to quinine distribution was its very high price in the black market, which reached Rs. 300 per pound. Not only famine victims but also well-to-do people were suffering from malaria; the latter were prepared to pay substantially for treatment. When quinine was sent to the districts it had to proceed under an armed guard, and when it

reached district headquarters was placed under lock and key in the local gaol. A District Magistrate in need of quinine had to arrange for the armed guard to proceed to Calcutta. A more convenient arrangement would have been for an armed guard to set out from Calcutta with stocks for several districts and visit them in turn. Naturally these precautions to secure the inviolability of consignments of quinine, no doubt necessary, did not oil the wheels of distribution. The situation was reached at which there was a large and urgent demand for quinine, stocks were available in Calcutta and the districts and patients with malaria were dying for want of quinine. It was reckoned that in November 1943 there were about 43,000 lbs. of quinine available in Bengal undistributed.

20. Later the distribution of anti-malarial drugs was improved. Civil Surgeons were made responsible for distribution in districts in place of District Magistrates. Ultimately anti-malarial drugs became available for malaria patients in hospitals and dispensaries throughout the province. But even as late as the second half of 1944, in spite of numerous efforts, the general distribution of quinine was far from satisfactory. Quinine remained a substance of high financial value and the temptation to those who handled it to make sales on the black market remained. The Director of Public Health stated publicly in December 1943 that "a vast quantity of quinine issued by the Government had gone into the black market." He added that there was a bigger margin of profit on the sale of quinine than on the sale of mepacrine and that unscrupulous dealers were carrying on propaganda against the new synthetic drugs so that the public might keep on demanding quinine.

21. **The creation of hospital services.**—Reference has already been made to the sum total of achievement in this important branch of famine relief. A large number of emergency hospitals were constructed and staffed, in spite of many and serious difficulties. Previous to the famine, hospitals were not popular in rural Bengal. People were reluctant to enter them as in-patients, which is scarcely surprising in view of the low standard of nursing: In many hospitals there were no night nurses or attendants and a patient might die at night without attention. It is greatly to the credit of those responsible for the creation of the famine hospitals that the latter become popular, largely because they provided better medical care and nursing than had previously been available in local hospitals.

22. Certain criticisms of the emergency hospital organization must, however, be made. During the early stages of the famine, when things were at their worst, progress was slow. Conditions in certain famine hospitals at this time, notably the Behala hospital in Calcutta, were indescribably bad. Destitutes picked up in the streets were usually taken to the Behala hospital in the first instance. Visitors were horrified by the state of the wards and patients, the ubiquitous filth, and the lack of adequate care and treatment, in spite of their appreciation of the efforts of the nursing superintendent who was striving, against formidable odds, to alleviate these conditions. In the districts little was done during the early months. On September 20th, 1943, the Government issued general instructions to District Magistrates and Civil Surgeons, giving them full authority to build additional hospitals, to open up new wards in existing hospitals, and recruit the necessary additional staff. The districts were in fact given *carte blanche* to spend what was needed for emergency medical relief. The results were meagre. The hospital situation in the districts in the early stages of the famine is illustrated by the following extract from a report presented to the Commission:—

"Hospital accommodation was entirely inadequate to start with, both in town and country. Moreover, it was only in some of the larger towns that any proper hospitals existed. The condition of patients was usually appalling. a large proportion suffering from acute emaciation, with 'famine' diarrhoea. It was exceedingly difficult to improvise additional hospital accommodation, or to secure medical and nursing staff. Sanitary conditions in nearly all temporary indoor institutions were very bad to start with, owing to the insanitary

habits of the inmates, lack of sweepers and inefficient supervision and management."

23. In November after the visit of the Viceroy and the arrival of the military there was a change in atmosphere. Medical officers of the Government of India and Bengal and military medical officers, working in collaboration, took the health situation in hand and drift was replaced by drive. Careful plans were drawn up for the construction, equipment and staffing of wards and hospitals and these were circulated to the districts. Under strong pressure the district authorities began to move. In a number of districts—Dacca and Faridpur are examples—progress in hospital construction was rapid and by January, 1944, the necessary hospital accommodation was available. In some, however, several months elapsed before effective action was taken. Such delays were due to various causes, including difficulties of supply and defects in the administrative machinery, and insufficient initiative on the part of the District Magistrates and Civil Surgeons concerned. There was also some lack of knowledge of the requirements of different districts. When plans were made certain districts were singled out as being most severely affected by the famine and their need for famine hospitals received special attention. As we have seen, a high excess mortality occurred in practically all districts during the first half of 1944, so that there was an urgent demand for medical relief almost everywhere in the province.

24. The obstacles encountered in getting the famine hospitals constructed and in working order are vividly described in the reports of touring medical officers presented to the Commission. In one place there would be difficulty in finding contractors and materials for building, in another lack of necessary drugs and equipment, in another shortage of satisfactory staff. Problems of transport and distribution were by no means entirely solved with the coming of the military. Many Civil Surgeons were unable or unwilling to exercise adequate supervision over the work of hospitals in their districts by frequent tours of inspection. The old sub-divisional hospitals, pressed into the service of famine relief, were found to be in many respects unsatisfactory. The opening of "satellite treatment centres" in association with dispensaries was on the whole an unsuccessful venture. The dispensary doctors, who had in-patients to look after in small emergency hospitals erected in the neighbourhood of dispensaries, did not give adequate attention to the "satellite centres".

25. The doctors recruited for famine work were in general of poor calibre. Their training had given them little knowledge and experience of hospital organization and little sense of duty and discipline. The young Indian army officers employed in medical relief were far more conscientious and efficient and did excellent work under difficult conditions. The poor standard of the civilian doctors must be ascribed largely to defects in their medical education. The army doctors had a very similar educational background, but after graduating had learnt orderly habits, discipline and teamwork as part of their military training. The difference between army and civilian doctors, which struck many observers during the famine, is hopeful in connection with the future development of medical services in India, since it shows that the standard of the medical profession could be decisively raised in a very short period by changes in medical education.

26. Up to November 1944, 25,551 and 203,702 patients were admitted to famine hospitals and wards in Calcutta and the districts respectively. For the mofussil hospitals these figures are from December 1943, but in the case of the Calcutta hospitals some admissions previous to that date are included. The number of deaths was 8,912 in Calcutta and 22,992 in the districts, 34·8 and 11·3 per cent. respectively of total admissions. These are very high hospital mortality rates and reflect the serious condition of the patients who received medical care. They also reflect the inadequacy of treatment in many hospitals.

The higher death rate in the Calcutta hospitals can be explained in various ways: in general the condition of destitutes who reached Calcutta from the districts during the famine was bad, and many were picked up in the streets in a moribund state and taken to hospital to die; in Calcutta most of the destitutes who were seriously ill reached hospital, while in the mofussil a larger proportion of such destitutes probably died without receiving hospital attention; the most acute phases of the medical emergency in Calcutta were during the months August to November, 1943, before the effort to put medical relief on a satisfactory basis was fully initiated.

27. **Provincialization of District Health Services.**—The famine emergency revealed the serious defects of the public health organisation in the districts. In certain other provinces, notably Madras, an improvement in the efficiency of health services has been produced by placing District Health Officers on a provincial cadre under the control of the Director of Public Health. The provincialization of district health services in Bengal was strongly urged by the Public Health Commissioner with the Government of India in November 1943, and at this stage the Government of Bengal was on the brink of action in the matter. The District Boards learnt, however, of the proposal to deprive them of the control of their health officers, and on December 21st a deputation of chairmen of District Boards met the Hon'ble Minister for Public Health and Local Self Government and protested against the impending move. The reasons for the proposal, the gravity of the public health situation, the necessity for vigorous and immediate action, were explained to the delegates who, however, argued strongly in support of the *status quo*. The Government acceded to their wishes, but obtained an assurance of complete co-operation with the Director of Public Health and a promise that the rates of pay for health personnel laid down by Government would be restored and enforced throughout the districts. An opportunity was thus given to the District Boards to prove their mettle under the old system. The Government asked the Director of Public Health to watch the situation and report any failure to fulfil the assurances given. Subsequent reports of the Director of Public Health showed that the state of district health organizations remained unsatisfactory in many respects.

In May 1944 the Government of India issued a Public Health (Emergency Provisions) Ordinance which gave power to take over the administration of health services. No action has, however, been taken with regard to the district health organization. The Commission has recommended that District Health Officers in Bengal should be enlisted in a provincial cadre, public health in Bengal being reorganized along the lines laid down in the Madras Public Health Act, 1939.

F.—Health services in Bengal and other Provinces.

28. A critical account has been given of the defects of the medical and public health services in Bengal and of their general failure to cope with the situation created by the famine. We do not wish to imply that such defects are peculiar to Bengal or that medical and health services in all other provinces, faced with similar emergency, would necessarily have acquitted themselves better. In certain provinces, medical and health services are organised on a more efficient basis than the Bengal services; in others they are not. All may deem themselves fortunate in having escaped the severe test to which those of Bengal were put.

G.—Destitute Kitchens.

29. The methods of feeding followed in the free kitchens have been severely criticised. There is no doubt that the quantity of food provided was below normal requirements—it was in fact a starvation ration. Apart from quantity, the food was unsatisfactory in nutritive quality, *e.g.*, in its content of protein

and vitamins. It was widely stated that the unfamiliar millets usually included in the gruel caused many deaths. In the districts recipients had often to walk 2-3 miles to obtain their 800 calories or less. The management of kitchens was not always what it should have been; abuse and corruption were far from infrequent.

On the other hand, the supply position during August to November 1943 made it difficult to provide a more satisfactory ration. There can be little doubt that the free kitchens run by Government and relief agencies, in spite of their shortcomings, did in fact save a large number of lives. Organized on a wide scale, they at least provided some food to many thousands of starving people. Many of the destitutes who made use of them could not, at least at the time when they first received relief in the form of food, have tolerated large meals. It is probable that most of the deaths ascribed to the inclusion of *bajra* and other millets in the gruel occurred in destitutes who were very weak and ill when they came to the kitchens. In the circumstances the swallowing of badly cooked gruel containing unfamiliar millets might produce intestinal irritation and precipitate famine diarrhoea and death. There is no evidence that this happened in any considerable number of starving destitutes. Those in a less desperate condition are unlikely to have suffered serious ill effects by consuming grains which are the staple food of many millions of healthy people in India. In other parts of India, healthy rice-eaters have been able to take millets without untoward results, beyond some intestinal discomfort during the first days or weeks of the change. In general reports of the ill effects produced by the gruel supplied by the kitchens seem to have been greatly exaggerated.

H.—Recovery and the Future.

30. If an individual who has suffered from famine is freed from disease and given the right sort of food, physical recovery is usually rapid and complete. The rapidity with which starved children returned to normal when they were properly cared for and given good food often astonished relief workers. The restorative effect of milk was particularly striking. A child admitted into a home in a diseased and emaciated state could be transformed in a few months into a healthy and happy child, without any permanent physical scars.

While under such conditions individuals could quickly recover from the effects of starvation, it must be emphasized that in general the famine may produce serious after-effects in the sphere of public health. There was still much malnutrition among sections of the population in 1944. An impetus may have been given to various diseases previously present in Bengal. For some years tuberculosis has been on the increase and the famine has probably hastened its spread; while we could obtain no evidence on this point, the deduction seems justified from what is known of the epidemiology of tuberculosis. Kala-azar may also have become more prevalent. Again, the famine provided malaria parasites with remarkable opportunities for extending their range and the malaria problem is likely to be most formidable during the coming years.

31. In the circumstances considerable effort is needed, first to restore health to the low pre-famine level, and next to bring about general improvement. Health conditions in Bengal are likely to remain abnormal until the end of 1945 or for a longer period and the need for the additional organizations created for famine work has not disappeared. Further it is essential, in the interest of future development, that what has been gained should not be lost. We have referred to the inadequacy of the medical and health services in normal times. No doubt there may be certain hospitals opened during the famine which are now no longer needed in the places in which they are located, and some of the additional health workers employed on special tasks in various famine areas may now appear to be superfluous. But Bengal as a whole needs more hospitals and health workers and every effort should be made to turn over the temporary

famine and medical relief organization to the permanent service of the province. For example, 40 military officers were still employed at the end of 1944 as sub-divisional health officers pending their replacement by suitable civilian officers. The military personnel cannot be indefinitely retained and it is important that these posts should not fall vacant. The sub-divisional health officers proved of the greatest value during the famine. It may be added that there are 84 sub-divisions in Bengal and a health officer in each sub-division is a reasonable objective.

It is not the responsibility of the Commission to define long-term health policies in Bengal. We have recommended that District Health Officers should come into a provincial cadre because this seems an immediate necessity. The reorganization of health and medical services in India is being considered by the Health Survey and Development Committee, and the report of that Committee will be available to guide the Government of Bengal in the future development of curative and preventive medicine.

I.—General Appreciation

32. The Bengal famine resulted in high mortality the basic cause of which was lack of food. The lethal epidemics of malaria, small-pox and cholera were associated in various ways with the famine and its disruptive influences on social life. The health situation which arose in 1943, was beyond the control of any health and medical service. The health and medical services in Bengal were, however, unfitted to meet the emergency because of defects in organization and inadequacy and inefficiency of staff, and some of the mortality which occurred could have been prevented by more vigorous and timely measures. During the famine period up to November 1943, there was almost a complete breakdown in the health services. In November the atmosphere of defeatism was partially dispelled and much effective work was subsequently done in the medical and public health spheres. Even at this later period, however, there were many unnecessary delays and failures. The story is, in fact, throughout one of belated efforts to bring the situation under control. This is said with full understanding of the numerous and formidable difficulties and full appreciation of all that was eventually done to overcome them.

CHAPTER V.—HEALTH IN OTHER PARTS OF INDIA.

1. The disastrous effect on the population of Bengal of lack of food has been described in detail. We shall now briefly inquire into the health position in the rest of India during the same period. During 1942-4 the food situation in various parts of the country gave rise to anxiety. Local shortages of various kinds of food occurred, and districts, in Bombay and Madras suffered from drought and came under the operation of the Famine Code. In general appropriate steps were taken by the governments concerned to prevent hunger and catastrophe was avoided. It is, however, important to ascertain whether the food situation in India outside Bengal has had any obvious effect on public health.

A. Birth rate.

2. The recorded birth-rate in British India remained steady at about 34 per *mille* from 1920 to 1940. In 1941 it fell to 32·1 and in 1942 to 29·4. In 1943 there was a remarkable fall to 25·6, a decline being recorded in all provinces. Of the major provinces, the largest recorded falls occurred in the following:

Province	Birth-rate 1938-42	Birth-rate 1943	Difference per cent
Bihar	28·6	18·2	−10·4
Bengal	28·0	18·8	−9·2
Bombay	37·2	29·7	−7·5
Punjab	40·3	33·0	−7·3
Assam	26·5	19·6	−6·9
United Provinces	31·5	24·9	−6·6

Relatively insignificant falls were recorded in the Central Provinces, Madras, Orissa and Sind.

Since population pressure has been held responsible for all the woes of India, a fall in the birth-rate must be regarded as an occurrence of great importance. With a population of 400 millions, a birth-rate of 34 per *mille* would add 13,600,000 babies to the population every year, while a rate of 26 per *mille* would add only 11,400,000 babies. The difference is 2,200,000, which is a very substantial difference. To the question whether the fall is a real one or a product of statistical omissions and fallacies we can only reply once more that vital statistics in India, whatever their inaccuracy, do indicate trends in the vital indices. Sources of error remain relatively constant from year to year. It can legitimately be concluded that a real fall has occurred, but its cause can be only a matter for speculation. In Bengal the fall in 1943 can be largely accounted for by the famine, but that occurring in other provinces is less easily explained. One of the major factors, in certain provinces at least, must be recruitment to the army and the transfer of male workers from rural to industrial areas usually without their families. If this is the main cause, it shows how strong the impact of the war has been on social life in India. There is little reason to suppose that, outside Bengal, shortage of food has

been an important factor in the reduction of birth-rate. Thus, a striking fall occurred in the Punjab, which certainly has not suffered from food shortage—which has, in fact been more abundantly supplied with food than ever before. In the Punjab there has been heavy recruitment of young men for the army. In Bihar, where considerable industrial development has taken place, the recorded fall was greatest. In general no relationship can be elicited between the degree of fall in the various provinces and the prevailing food situation during 1942 and 1943.

B. Death rate.

3. The death rate returned for India in 1942 was 21·2 per *mille*, the lowest on record. Since the decade 1911-20, in which the recorded death-rate was about 34 per *mille*, there has been a fairly steady decline, with annual fluctuations. In 1943, there was a rise to 23·4, an increase, of 1·1 per *mille* over the 1938-42 average. This is largely accounted for by famine deaths in Bengal, but significant increases were reported in Orissa and Madras as follows:—

	Death-rate 1938-42	*Death-rate* 1943
Orissa	26·8	30·9
Madras	22·5	25·5

4. The Punjab showed a rise from 24·6 to 25·4, the main cause of which was a serious epidemic of malaria. In all other provinces there was a decline in 1943. A fall in the birth-rate must in ordinary circumstances lead to a fall in the death rate, since infant deaths make a heavy contribution to total mortality Thus a rise in the death-rate in the age groups above infancy might be masked by a reduction in the number of infant deaths. Leaving aside, however, possibilities of this nature, it is clear that in the greater part of India in 1943 no gross deterioration in health conditions, reflecting itself in rise in the death rate, took place. The famine in Bijapur in Bombay was successfully handled and there was no abnormal mortality.

5. The province of Orissa demands more detailed consideration. Orissa is a surplus province as regards rice but purchases of rice by agents and merchants from Bengal during the free trade period pushed the price almost up to the Bengal level, so that in parts of Orissa, as in Bengal, the poor could not buy enough food. The total recorded number of deaths in Orissa in 1943 was 233,584, an increase of 17·9 per cent over the quinquennial average of 198,150. In the district of Balasore, bordering on Bengal, the increase in mortality was 40·7 per cent. In this district 1,105 deaths from starvation were recorded, but many of the victims were destitutes from Bengal. The rise in the death-rate in the province as a whole was due largely to epidemics of cholera and malaria, but there was also an increase in the number of deaths reported under the head "dysentery and diarrhoea". During the months August to December, 11,194 deaths were recorded as against a quinquennial average of 7,563. The Director of Public Health, Orissa, in giving evidence before the Commission, expressed the opinion that the increased mortality in Orissa in 1943 was due to food shortage, migration within the province, and the influx of destitutes from Bengal. Some of the latter died in Orissa and moreover they carried with them epidemic diseases which spread among the Oriyas. An increase in vitamin deficiency diseases was observed in 1943. The Director of Public Health also laid stress on the poor quality of the diet consumed by the bulk of the population in Orissa, even when rice is available in sufficient quantities. There is a serious shortage of milk, fish, pulses, and vegetables, and in normal times standards of nutrition are low.

6. Much of the excess mortality in Madras in 1943 can be ascribed to the severe cholera epidemic. The relation between cholera and food shortage has been discussed in a previous section. The Director of Public Health, Madras, informed the Commission that the cholera epidemic in 1943 spread from district to district in the usual manner of such epidemics. The very severe outbreak in Malabar waned in August 1943, without any improvement in the food situation. He felt that the appearance and spread of the disease could be explained on epidemiological grounds without particular reference to food scarcity. The famine in the Ceded Districts, which affected a large population, was kept under control by the operation of the Famine Code and was not accompanied by exceptional mortality. The economic condition of the people in this part of Madras is low even in the years intervening between recurrent famines, and in famine years the reduction in malaria incidence due to drought may offset other inimical health conditions. Study of mortality rates in the deficit district of Malabar, where rice supplies are short and the population has been strictly rationed at a low level of intake, shows that mortality was well above the average during the first 6 months of 1944 and that the increase was most marked in the age groups 5 to 10 and 10 to 15. The Commission is not in a position to make a detailed investigation of vital statistics in Madras with reference to the possible effect of the food situation on mortality. That task is the responsibilty of the Provincial Health Department. The effect of the food situation on health in Madras (as elsewhere in India) requires most careful watching, but at least it can be said that Madras has passed through the crisis of 1942-4 without catastrophic results in the health sphere.

7. No satisfactory mortality statistics for Cochin and Travancore are available for study. Evidence was presented to the Commission in Travancore of a fall in the weight of infants at birth and a fall in the weight of elementary school children, records of earlier years being used as the basis of comparison. It seems probable that under-nutrition and malnutrition are responsible for the change observed. Here again it is essential that the health authorities should keep a vigilant watch on health conditions and report any evidence of deterioration.

8. In Bihar there were no abnormal health conditions in 1943 and the death rate was below the quinquennial average. In 1944 severe epidemics of malaria and small-pox broke out in North Bihar and the serious public health situation in this area was ascribed to malnutrition by certain newspapers and political leaders. The Commission had no opportunity of visiting Bihar to study the position. No evidence has however been put before it in support of the view that the outbreak of epidemic disease was associated with food shortage and malnutrition.

9. While there is no statistical evidence that food shortage had led to a serious increase in mortality outside Bengal and Orissa, it must be emphasized that the study of mortality rates is a crude method of investigating the effect of the food situation on health. The possibility that the health of certain groups in the population has been adversely affected cannot be dismissed. During recent years some sections have consumed more food than before the war. The high price of grain has enabled villagers to pay their dues by selling a smaller proportion of their produce than formerly and thus retain more for their own use. Large groups of workers in industry are being paid high wages which allow them to increase their intake of food. In some industrial areas cereal supplies for workers are heavily subsidized, while in others very substantial dearness allowances, which more than cover the increase in the price of grain, are being paid. On the other hand there are groups whose wages have not risen proportionately to the rise in the cost of living, *e.g.*, lower middle class people in clerical and other occupations, and their health may have

suffered through restriction in diet. In a broad survey of health conditions, deterioration in one group may be masked by improvement in another.

10. Special reference must be made to the high cost and scarcity of protective foods such as milk, fish and vegetables. The intake of such foods on the part of the poorer classes in general is low in normal times. Among certain groups it has been further reduced by high prices. Lower middle class families cannot afford to buy protective foods even in the limited quantities to which they were accustomed before the war. This is bound, in the long run, to lower standards of health and careful investigation would probably reveal that some deterioration has already taken place. It is of the utmost importance that the food problem of India should not be regarded solely as a problem of providing enough cereals and distributing them equitably so that everybody gets enough to eat. The objective must be the provision of a well balanced diet containing protective foods in adequate amounts.

11. **Recommendations.**—The Commission recommends that District Health Officers should be brought into a provincial cadre under the control of the Director of Public Health, for reasons which have been made clear in the preceding chapters. With regard to the status and duties of health officers, we are of the opinion that legislation along the lines of the Madras Public Health Act, 1939, is desirable. We do not feel it incumbent on us to make specific recommendations about the reorganization of health and medical services in general, which includes such questions as the status of subordinate health personnel in the districts. The nature of the health and medical organization required to meet the needs of Bengal is a problem for detailed consideration by experts. We have referred to the Health Survey and Development Committee which is concerned with the health problems of India and will deal with provincial requirements and organization in respect of medical and health services. We have no doubt that the Government of Bengal will give their full attention to the recommendations of this Committee.

12. We commend the steps which are being taken to provincialize hospitals at district and sub-divisional headquarters. The state of local hospitals revealed by the famine indicates the need for this measure.

13. Our terms of reference include "the provision of emergent medical relief and the emergent arrangements for the control of epidemics in those areas and in those aspects in which the present system may be found to be faulty". These questions have been dealt with in the chapters on "Death and Disease". We have shown that satisfactory "emergent medical relief" depends on the existence of a satisfactory organization in normal times. This applies, not only to Bengal, but to the whole of India. Apart from any possible danger of a recurrence of famine, the need for the improvement and development of health and medical services in Bengal is indeed obvious.

14. In conclusion we may add that, whatever future advances are planned, the need for the existing emergency medical and health organization will persist until the end of 1945, and possibly for a considerably longer period. We may further point out, that not only should there be no premature retrenchment, but that full use should be made of developments during the famine as a foundation for further progress.

PART III

FOOD ADMINISTRATION & REHABILITATION IN BENGAL

CHAPTER I.—THE SYSTEM OF SUPPLY AND DISTRIBUTION

A.—Supplies and Prices after the Famine.

1. The famine of 1943, ended with the harvesting of the *aman* crop in December of that year. This crop was probably the largest in the history of Bengal. The following table shows the acreage and yield of the *aman* crop reaped in December 1943, as compared with that of the preceding two years according to estimates made by the Government of Bengal:

The Aman Crop

Year	Acreage (in million acres)	Yield (in million tons)
1941	16·91	7·40
1942	16·21	5·02
1943	18·18	8·53

According to these figures the *aman* crop acreage increased by 1·27 million acres in 1943, as compared with 1941. The figures are, however, not comparable because the method of estimating the acreage was changed in 1943. As we have explained the normal acreage assumed for statistical purposes in the past does not agree with the acreage as recorded in the settlement records and in consequence there has been a systematic underestimation of the acreage of the *aman* crop.[1] We have been told that in preparing the estimate for the *aman* crop reaped at the end of 1943, an attempt was made to correct the acreage figures with reference to the figures given in the settlement records. The revised acreage is, however, still below the settlement figure of 19·22 million acres and hence we think that probably it is even now an under-estimate. We understand that with a view to obtaining accurate agricultural statistics the Government of Bengal have recently sanctioned two schemes: one, a plot to plot enumeration of all crops and the other a random sample survey of the jute, *aman*, and the *aus* crops. It is proposed to continue both surveys for a period of three years and then to decide on future policy. The cost is heavy, being Rs. 43 lakhs in the first year and Rs. 31 lakhs in each of the two succeeding years. We trust that as a result of this large expenditure accurate figures of acreage will be obtained.

2. As we have said, the *aman* crop reaped in December 1943, was an excellent one. During 1944 the supply position was satisfactory and the Government of Bengal were able to accumulate, by the end of the year, a reserve stock of over 600,000 tons of rice and paddy in terms of rice. It is unlikely that the whole of the surplus passed into the hands of the Government and if that be so, the carry-over at the beginning of 1945 was in all probability equal to several weeks' supply. The *aman* crop reaped in December 1944, was not as good as the bumper crop of the previous year and according to the estimates prepared by the Government of Bengal, the yield of the former is less by 1·44 million tons than that of the latter. It is probable, however, that this reduction will be offset by the increase in the carry-over at the beginning of 1945, as compared with that at the beginning of 1944.

[1] Para 9 of Appendix II.

3. The bumper *aman* crop was the principal factor in the restoration of confidence and the fall in prices during 1944. There were also other factors. The Government of India undertook the responsibility of providing Bengal with a supply of rice sufficient for the needs of Greater Calcutta during 1944. This was obtained from other parts of India under the Basic Plan. This arrangement was made in order to help in the restoration of normal conditions by taking the Calcutta demand completely off the Bengal market. In 1943 the Calcutta demand had been the largest single disturbing factor in that market. Rationing was introduced into Greater Calcutta in 1944. Employers whose employees number a thousand or more, were prohibited from purchasing rice and paddy for supply to their employees except through Government. Rice mills were brought under control and prohibited from selling rice except to the procurement organization of the Government, or under permit, to a limited number of approved wholesale dealers. All employers of labour supplying foodgrains to their employees were prohibited from having in their possession, except under permit, more than two months' requirements of rice and paddy. Consumer stocks were limited by an order forbidding any person, other than a producer or a trader licensed under the Foodgrains Control Order, holding more than 20 maunds of rice and paddy without a permit. Exports from surplus districts were prohibited. A procurement organization was established for making purchases on behalf of Government in order to meet the requirements of the deficit areas, for making supplies to employers of labour who were prohibited from making private purchases, and to build up a provincial reserve. Finally, the organization for the general enforcement of food controls was developed during the year.

4. The system of price control by the fixation of maximum prices, introduced in August 1943, continued during 1944. These prices were successfully lowered at relatively short intervals. Two sets of statutory maxima are now in force in different areas of the province. They are as shown below:

Price per maund.

	Rice.		*Paddy.*	
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Wholesale traders .	13 8 0	and 14 12 0	7 8 0	and 8 4 0
Agriculturists . .	12 12 0	and 14 0 0	7 4 0	and 8 0 0

On the reaping of the *aman* crop market prices fell sharply from the abnormal levels of 1943. Thereafter they remained fairly steady until about August 1944, when there was a further fall. At the end of the year they were approximately at the same level as at the end of 1942.

B.—Conditions in the Immediate Future

5. Conditions in Bengal during 1944 were specially favourable in two respects. One was the bumper *aman* crop reaped in December 1943, and the other was the special arrangements made by the Government of India for supplying the needs (rice) of Greater Calcutta from other parts of India. It is necessary to realize the exceptional character of these two factors and to be sure that food administration in Bengal is so organized, that it will function effectively under less favourable conditions. It is true that there is a tendency for the rice acreage to increase—this may be maintained in view of the prevailing prices —but it is unlikely that the yield per acre of the *aman* crop during the next few years will be as high as it was in December 1943. Again, lean years consequent on poor *aman* crops appear to occur regularly in Bengal. The sequence in the past has been 1928, 1936, 1941 and 1943. It cannot be said when the next lean year will occur. We may hope that it will be long in coming, but it would be imprudent to assume that such an event will not happen before

imports of rice from abroad once again become available on the same scale as before the war.

6. The supplying of rice for Calcutta from other parts of India in 1944 was recognized at the time to be a special arrangement. It has since been decided that this arrangement will not continue in 1945, and allocations under the Basic Plan will be made to Bengal in the same manner as to other provinces and states, that is, with reference to their actual need for imports. This does not, of course, mean that Calcutta will not receive supplies from other parts of India. As regards wheat the necessary allotments will be made. In respect of rice the needs of Bengal will be reviewed at appropriate intervals by the Government of India, in consultation with the Government of Bengal, and allocations, if necessary, made from the stocks available to the Government of India under the Basic Plan. In making these allocations due regard will be paid to any special circumstances arising in Bengal from its proximity to the war zone, as well as to the special needs of other parts of India. It is, however, clearly necessary that Bengal should make the fullest use of its own resources. During 1944 much was done towards the improvement of food administration in Bengal. Rationing of Calcutta was a major advance. The results of procurement have been satisfactory and Government have been able to build up a large reserve of rice and paddy. But there is still room for improvement in the organization which has been developed for procurement specifically and for the enforcement of controls generally, before it can be regarded as adequate to meet more difficult conditions than those prevailing during 1944. We shall now consider the improvements required.

C.—Urban Rationing

7. Apart from Greater Calcutta which includes the cities of Calcutta, Howrah, and 30 other municipal towns, with a total population of about 4 millions, the only towns in which a true system of rationing has been introduced are Chittagong and Kurseong. In a considerable number of other towns "partial rationing" schemes are in force. These, however, are not true rationing schemes for, every person, in addition to the ration he draws from Government supplies, is free to obtain further foodgrains from the ordinary retail shops. There is also no restriction on private trade in rationed foodgrains. What these schemes seek to assure is a minimum ration, generally of 2 seers per adult person per week, and even that is not guaranteed, for it is liable to be reduced if Government stocks are inadequate.

8. We attach great importance to the rationing of the urban population and Bengal, in this matter, has lagged considerably behind many provinces. We note that even Dacca, a town with a population of over 200,000, has not been rationed. We recommend that the Provincial Government should undertake as rapidly as possible the rationing of every truly urban centre. Many of the small municipal towns in Bengal are in reality only overgrown villages and include within their boundaries a considerable amount of agricultural land. We do not suggest that these small towns which are, strictly speaking, not urban areas, should be rationed. It would not be worth while. What we propose is that the rationing of towns with a population of about 25,000 or more should be carried out as quickly as possible and that, thereafter, in the light of the experience gained, a decision should be taken whether towns with a smaller population should also be rationed.

D.—Enforcement

9. **The Foodgrains Control Order.**—We regard this Order as a most important weapon in the armoury of food administration in Bengal, for it is the only means by which the stocks in the hands of traders can be watched and controlled. It has, however, not been administered efficiently in Bengal. We consider that