

**STANDARDS OF MEDICAL CARE  
FOR  
TEA PLANTATIONS IN INDIA**

**A REPORT**

**BY**

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**GOVERNMENT OF INDIA  
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## CHAPTER I

### CIRCUMSTANCES LEADING TO PRESENT REPORT. PRELIMINARY TOUR OF TEA PLANTATIONS

*First Tea Plantation Labour Conference.*—On the 8th and 9th of January 1947, the First Tea Plantation Labour Conference, attended by representatives of the Government of India, Provincial Governments, employers, and workers in the tea industry, was held at New Delhi.

The object of the Conference was to enquire into the specialised labour problems of the tea industry, and to decide what specific measures should be taken to ensure that the million or more workers in the industry should be given adequate wages, and reasonable conditions of work.

Among the subjects discussed at the Conference were sickness and maternity benefits, medical aid, and welfare activities.

Certain proposals with regard to medical aid were submitted by the Government of India for consideration, namely :—

- (a) That statutory power should be taken to prescribe the scale of dispensary services which gardens should provide, the stock of medicines to be kept, the number of doctors to be appointed, their qualifications, etc.
- (b) That medical services should be provided on a scale which would cost about Rs. 10 per worker per annum. A cess should be levied to bring in a revenue of about 90 to 95 lakhs of rupees a year for financing the medical services. Following what had been done in the coal mining areas, construction and maintenance of Central Hospitals would be the responsibility of a Central Authority, while the maintenance of dispensary and domiciliary services would be the responsibility of the individual gardens except where the gardens were too small to organise these services on an adequate basis. Gardens maintaining services up to the requisite standard would receive a grant from the Fund for the upkeep of the medical services.

In the discussion which followed the general view was expressed by the employers' representatives that the Government should prescribe the standards and enforce them, the actual provision of medical services being left to the employers. Large gardens would run their own services, while small gardens would combine and share the expense.

It was finally agreed that the employers should submit their proposals to Government through Provincial Governments, and that the matter would be discussed again at the next Conference.

In pursuance of this decision, Major E. Lloyd Jones, I.M.S. (E.C.) was deputed by the Government of India to visit tea plantations in India, and draw up, in consultation with the Provincial Governments and the Employers Associations, standards of medical care for labour in tea plantations.

*Commencement of tour.*—Having interviewed Sir P. J. Griffiths, Political Adviser to the Indian Tea Association Major Lloyd Jones left New Delhi on the 15th of February 1947, and proceeded to Calcutta, where preliminary discussion with representatives of the Government of Bengal, the Indian Tea Association, the Assam/Bengal Tea Planting Association and the Indian Tea Planters' Association, Jalpaiguri, took place.

## ASSAM

From Calcutta Major Lloyd Jones proceeded to tour and make a survey of tea plantations in Assam. The following areas were surveyed, medical arrangements inspected, and discussion held with superintendents, managers and medical officers connected with the industry in each area :—Seleng Hat, Amgoorie, Panitola, Chabua, Dibrugarh, Jorhat, Mariani, Lalhimpur, Silchar, Labac, Lungla and the Juri valley. It will be noted that most of the important 'tea' areas in Assam were included in the tour.

In all 82 gardens were surveyed, of which 52 were situated in the Assam valley, and 30 in the Surma Valley. 74 gardens were owned by European companies, and 8 by Indian companies. Having completed the tour, a meeting was attended in Shillong, at which representatives of the Government of Assam, including the Chief Secretary, Sir G. H. Dennehy, the Inspector General of Civil Hospitals, Colonel S. L. Bhatia, I.M.S., and the local representatives of the Indian Tea Association were present. A draft outline of his proposed recommendations to the Government of India was circulated by Major Lloyd Jones, and this draft formed the basis of discussion. Subject to minor amendments, which were accepted by Major Lloyd Jones, the draft proposals were approved by all present.

The amended draft was discussed a few days later in Calcutta at a meeting called by the Chairman of the Indian Tea Association, at which representatives of the various Employers' Associations were present. With a very few minor additional amendments the proposals for Assam were provisionally agreed to by all present. A copy of the draft recommendations as provisionally agreed is placed below at Appendix I. (N. B.—There have been some subsequent amendments which are embodied in the final recommendations in Chapter V.)

Having completed his tour of Assam, Major Lloyd Jones returned to New Delhi on the 23rd of March, 1947, and on the 26th of April left New Delhi to tour tea gardens in North Bengal.

## NORTH BENGAL

*The Dooars.*—The tour of the Dooars commenced at Jalpaiguri, where preliminary discussion took place, with the Committee of the Indian Tea Planters' Association, Jalpaiguri. Following this meeting tea gardens in the area were visited commencing at Manabari in the West Dooars and continuing *via* Matelli, Nagrakata, Banarghat, Birpara, Chuapara, Kumargram, Dhowlajhora to Nowlands in the East Dooars finally returning to Jalpaiguri on the 6th of May 1947. In this part of the tour 46 gardens were visited and their medical organisation inspected.

*The Terai.*—Two full days were spent in the Terai, the 7th and 8th of May 1947. 14 gardens were visited under the guidance of Mr. C. L. Burton, Chairman of the Terai Tea Planters' Association, and their medical organisation inspected.

*Darjeeling.*—The tour of the Darjeeling District commenced on the 9th of May with a discussion with the Committee of the Darjeeling Tea Planters' Association. During the succeeding days 19 gardens were surveyed under the guidance of Lieut-Colonel E. S. E. Rerrie, Secretary and Labour Officer of the Darjeeling Tea Planters' Association, and their medical organisation inspected.

Having surveyed 79 gardens in North Bengal, Major Lloyed Jones returned to Calcutta on the 15th of May, where a further meeting was held with the Employers' representatives. At this meeting Major Lloyd Jones circulated copies of his draft proposals for Bengal which were fully discussed and provisionally approved by those present.

Consultation also took place with representatives of the Government of Bengal, including the Hon. Mr. Mohammed Ali Minister for Local Self, Government and Public Health, Mr. Roy, Secretary of the same Department and the Surgeon General Major-General D. Clyde, I.M.S. The draft recommendations for standards of medical care on tea plantations in Bengal which had already been provisionally agreed to by the Employers' representatives, were provisionally approved by the representative of the Government of Bengal.

A copy of the draft recommendations for Bengal, as provisionally agreed, is placed at Appendix I. (N. B.—There have been some subsequent amendments, which are embodied in the final recommendations in Chapter V.)

Having completed his tour of North Bengal, Major Lloyd Jones returned to New Delhi on the 17th of May 1947.

#### SOUTH INDIA

The tour of South India commenced at Coonoor on the 6th of July 1947. The medical arrangements of 42 gardens in the Nilgiris, the Nilgiri-Wynaad, and the Annamallais were surveyed, the tour terminating at Madras on the 15th of July.

Consultation took place with Mr. L. E. Mitchel, Secretary of the United Planters' Association of South India, and with the officials of the various local Planters' Associations.

Subsequently the findings were discussed with the Minister of Health for Madras, the Hon. Shri B. Shetty, the Joint Secretary for Health with the Government of Madras, Mr. Vishwanath Ayyar, and with the Surgeon General with the Government of Madras, Colonel S. L. Bhatia, I.M.S. who were in general agreement with the proposals, which were identical with those for the provinces of Assam and Bengal.

The whole tour finally concluded, Major Lloyd Jones arrived back in Delhi on the 20th July, having completed a survey of over 200 Indian Tea Plantations.

## CHAPTER II

GENERAL STATE OF HEALTH OF TEA PLANTATION LABOUR  
ASSAM

The general-impression gained during the tour of Assam was that the state of health of the labour was poor. Under-nourishment and general weakness were evident even among the people seen working on the gardens, or walking along the roads. There seemed a general lack of vitality. Children were rarely seen running about or playing. They ambled along like old men. The women in their general demeanour were very different from the coolie women of Northern India, with whom the writer is more familiar. At work on the gardens or taking in their tea to the factory, they trudged along silent, morose, their eyes fixed on the ground in front of them. The contrast with a crowd of Delhi coolie women was most marked. Part of this may be due to racial differences, but probably most of it is due to the fact that by reason of under-nourishment their vitality is at such a low ebb that there is none to spare for the lighter aspects of life.

This impression was borne out during visits to out-door dispensaries and hospitals. The vast majority of patients attending for out-door treatment were illnourished and anaemic. An excellent opportunity of seeing the non-working children was afforded at meal times in connection with the scheme for central feeding. Children who were obviously sick constantly met the eye, and young children very much under nourished were frequently seen.

*Vital Statistics.*—The general impression gained by casual observation is borne out by such vital statistics as were obtained. These are shown at Appendix III,

Perusal of the summary at Appendix IV shows that the average mortality rate from all causes of 37 European owned gardens in Assam for 1946 was 19.9 per thousand. The infant mortality rate, which is usually regarded as an accurate index of the health of any given community was 168.8 per thousand births. The worst feature, however, was the enormous maternal mortality rate, which was 28.8 per thousand live births for the same gardens.

Figures for Indian owned gardens in Assam were only obtained for 5 gardens. This number is too small to be of accurate statistical significance but so far as they go the figures support the view that the Indian owned gardens are even worse in their vital statistics than the European gardens. In the Indian owned gardens surveyed, the average mortality rate from all causes was 23.1 per thousand, the infantile mortality rate was 213.0, and the maternal mortality rate 37.8. The significance of these figures may be gauged by comparison with the corresponding figures for an English industrial city, with a large working class population, for 1945, which were, mortality from all causes 14.4 per thousand, infantile mortality 55.8 per thousand, and maternal mortality 1.02 per thousand. The Assam figures, judged by this standard can only be described as lamentable, although it is not suggested that they are any worse than the true rates for the Province of Assam as a whole.

It will be observed that the least unsatisfactory figure is the mortality rate from all causes, which is only about 38 per cent higher than the English figure. Since the general mortality rate embraces the infantile mortality rate, it is clear that the major cause of the high mortality rate is the very high infantile death rate, combined with the high birth rate. This of course also applies, though with less force, to the maternal mortality rate.

It is therefore clear that the main tragedy, so far as can be judged from the vital statistics, is the high death rate among infants, and the frightful mortality at confinement. These outstanding facts must be borne in mind when standards of medical care come to be considered.

The summary of vital statistics also reveals another marked feature which was borne out by personal observation. That is the figures show that the general state of health in the Surma Valley is better than that of the Assam Valley. This is all the more remarkable since the general standard of provision of medical care in the Surma Valley is in many respects much inferior to that of the Assam Valley. In patient beds, for example which are almost universal in the Assam Valley, are not nearly so frequently met with in the Surma Valley.

The main reason for the better health of the labour in the Surma Valley probably lies in three causes:

Firstly the labour force is more settled, and nothing like as great a percentage is imported for relatively short periods. In the Assam Valley a fair proportion of labour is imported for periods as short as three years, and the general physique and stamina of the imported labour is inferior to that of the indigenous labour.

Secondly, a higher proportion of the labour in the Surma Valley is non-vegetarian. This means that other things being equal they have a higher intake of first class protein.

Thirdly, for some reason which was not explained, the labour in the Surma Valley is much better than that of the Assam Valley from the point of view of growing their own vegetables, keeping cattle and poultry, etc. This no doubt results in a higher standard of nutrition in the Surma Valley and since a large proportion of the ill-health is directly or indirectly due to poor nutrition, the better state of nutrition is reflected in the better general health of the whole population.

*Main causes of ill-health.*—The causes of ill-health among the tea labour population of Assam are many, and it is difficult to assign to each individual cause its proper significance.

Some of the causes may be said to be peculiar to the terrain. Malaria for example, is probably still the main single disease which has to be contended with, although it is rapidly losing this place of doubtful honour. Enormous sums of money, and prodigious efforts, have been expended in order to combat malaria, in fact it would probably be true to say that the anti malaria campaign in the tea industry in India has been the biggest single campaign against disease any where in the world. The results have been excellent, but in spite of the active and sustained warfare which has been waged against malaria for many years, the problem is still far from a complete solution.

[Defective and impure water supplies are also of importance, and water borne infectious diseases are still a problem on tea plantations.] Many gardens, of course, have faultless supplies of water, but too many still depend for their supply on surface wells, and other sources which are liable to mass contamination. There is a tendency to consider that if a piped water supply is laid on all is well. This is not by any means the case. If the original source of supply is liable to contamination, mere piping from the source of supply to the point of distribution is of little avail.

Closely allied to disease due to impure water is disease due to lack of proper conservancy methods. Conservancy on tea plantations is primitive in the extreme. Even where relatively safe methods of conservancy are provided, the ignorance of the labour often renders it ineffective. Much education and propaganda are needed here.

Poor housing also plays a part in the causation of the wide spread ill-health

It is probable, however, that the most important single cause of ill-health is the poor standard of nutrition. Efforts to improve this by the issue of some of the more essential foodstuffs by the gardens have been made, and no doubt have helped the situation a good deal. Communal feeding of non-working children has also helped matters. But even with these advances the consumption of a balanced diet must be almost unknown among tea garden labour in Assam. The importance of a balanced diet, sufficient in both calories and accessory food factors, does not appear to be fully realised even by the doctors working on the gardens. One was frequently shown figures of the calories being consumed daily by the labour on individual gardens, often with a glow of pride on the part of the demonstrators. There is much more than mere calories in the building up of a satisfactory diet. If it were a mere matter of calories a bottle of gin daily would be the perfect diet. The normal diet of a tea garden labourer consists of rice, dal, a little vegetable, a little sugar, mustard oil, spices, salt and a doubtful supply of drinking water. This is supplemented on suitable occasions by rice beer. Milk and milk products are hardly taken at all. Meat, fish and eggs are not taken at all by the majority and only rarely and sparingly by the remainder. A healthy population on this diet is of course impossible.

The reasons for the poverty of diet are in turn many, but the general lack of proper food distribution initially caused by the war, combined with the low wages paid to the labour in the past are probably the most important. The solution is not easy. Higher pay of itself is certainly no solution. In the Assam Valley particularly, one of the main reasons for the deterioration in nutrition lies in the general disruption arising from the war, and the influx of a totally artificial floating population into the area. Before the war the local labour kept pigs, poultry, goats and cattle. During the war they were overwhelmed by a huge temporary population, flush with money, and anxious to buy up any fresh food stuffs which might be available. Prices of cattle, poultry, etc. soared to unprecedented heights, and the labour was quite unable to resist the temptation to sell off their stocks at the fantastic prices which were then current. The result was that the whole countryside became denuded of cattle, pigs and poultry. The indigenous population killed, without realising it, the goose which laid the golden eggs, and they are now paying for their lack of foresight. If the state of nutrition of tea plantation labour is to be improved, bold schemes for increasing the stocks of cattle, goats, pigs and poultry, and for increasing the local production of vegetables and fruit, will have to be undertaken. If this is left to chance, or to the labourers themselves, little improvement will result. The labourers are at present overwhelmed by the calamity which has overtaken them and have neither the insight and understanding, nor the capital, to make any substantial attempt to mend their own fortunes.

*Important types of sickness.*—No attempt was made to obtain classified figures of types of sickness, as it was felt that in the main such figures were not likely to be accurate, and therefore might prove actually misleading. At



the same time, in the few gardens where records were apparently being well kept, note was taken of the relative importance of the main diseases. From these data the following general conclusions were derived:—

*Malaria.*—This still remains one of the most important causes of sickness, although with the re-institution of schemes of malaria control, which had largely fallen into abeyance during the war, there is definite evidence that malaria is becoming of steadily decreasing importance as a cause of mortality and morbidity. The introduction of suppressive Mepacrine treatment has also had a marked effect in those gardens where it has been put into operations, although opinions of doctors practising in 'tea' vary enormously as to its ultimate value. Several doctors interviewed were doubtful of its value as a long term policy, were as one medical officer with a very large practice went so far as to say that malaria had practically disappeared on the gardens under his control since the introduction of suppressive Mepacrine treatment. Without, it is hoped, being held unduly sceptical, this seems rather an extravagant claim.

The introduction of Paludrine, the new anti-malaria drug, seems to hold out distinct possibilities in the attack on malaria. Recent reports of trials in Assam itself suggest that it is likely to be much more potent than Mepacrine as a suppressive and therapeutic agent. Some workers claim with confidence that with its general use malaria will disappear. This is probably too optimistic, but it can safely be said that Paludrine will be a most valuable weapon in the armamentarium of the doctor practising in a malarious area.

*Bowel diseases.*—Bowel diseases still remain a great problem among tea labour in Assam. Cholera is by no means unknown, while the typhoid group and the dysenteries still account far from 20 to 30 per cent. of the total serious sickness on some gardens. The real method of attack on these diseases should of course be by better water supplies and conservancy methods. No amount of medical treatment will ever result in marked reduction in the incidence of these diseases until their causes are removed.

*Anaemia.*—Various kinds of anaemia are almost universal among the tea labour population in Assam. On one garden visited the medical officer had taken blood samples of over 500 of the garden population at random. None of the samples were taken from people reporting sick. Only one of the samples showed a haemoglobin content of over 65 per cent. and the vast majority showed haemoglobin contents of less than 50 per cent. Personal observation supports the view that this is by no means an isolated example. Many of the anaemias are secondary, hypochromic and microcytic in type and are capable of improvement by simple therapeutic measures if taken in hand reasonably early. Most of these cases are secondary to malaria, bowel diseases and hookworm. Hookworm is very widespread, and some doctors say almost universal in some areas. Attempts to treat it are made by routine dosage with anthelmintic drugs but these are of course merely palliative measures, and can have no lasting value until the causes of the condition, namely bad conservancy measures, and the ignorance of the population, are removed. Apart from these cases, the origin and causes of which are, well known, macrocytic anaemias, of the nutritional and pregnancy types are very common and are the cause of a large proportion of the enormous maternal mortality.

Excessive child bearing must also be a potent cause of anaemia and debility amongst women on tea plantations.

Very often a woman is no sooner rid of one child than she starts to bear another. The drain upon the constitution of such unfortunate women must be enormous.

*Kala-azar*.—*Kala-azar* is fairly common on tea plantations in Assam and the general impression gained from medical officers was that it was on the increase. On some gardens fears that it might again reach epidemic proportions, as it did some years ago, were evident.

*Tuberculosis*.—General concern was expressed by the medical officers of the gardens visited at the increase in the incidence of tuberculosis. In his Presidential address for 1947 the President of the Assam and North Bengal Branch of the British Medical Association, Colonel C.S.P. Hamilton, said "Tuberculosis is increasing at an alarming rate", and made a strong plea for better living accommodation for the tea garden labour.

*Leprosy*.—Leprosy is not markedly common on tea plantations, but there is a small number of lepers on most gardens. In only one place, namely Labac, was any attempt seen to isolate lepers. At Labac a most successful colony is in existence, which might well be copied by other tea plantations.

To sum up, the main causes of sickness and mortality on tea plantation in Assam are malaria, bowel diseases, and anaemia. Malaria is steadily becoming of less importance, and the importance of nutritional and other anaemias is steadily increasing. There are, of course, other important causes of disability, such as Naga sore, various skin and eye affections etc., but the incidence of these varies very much in different parts of Assam, and their importance is relatively very much less than that of the three main groups mentioned above.

## NORTH BENGAL

Most of what has been said with regard to Assam holds good with regard to North Bengal, with some reservations. In the first place the general health of the labour in Bengal is certainly better on the whole than that of the labour in Assam. Moreover the general health standards improve as you go from East to West. Both these statements are borne out by the summary of vital statistics at Appendix IV. The reason for the better health is that the factors which have already been mentioned as causes of ill-health and mortality in Assam, although they may also be operative in Bengal are by no means as marked. Bengal, although seriously affected by the war in many ways, including the transfer of a large proportion of the tea labour to work on projects on the Assam/Burma frontier, did not experience the enormous influx of population which was experienced in the Assam Valley. For this reason the area was not denuded of its livestock to quite the same extent, although serious inroads were made even in Bengal.

*Nutrition*.—Apart from this the labour population in Bengal seems to take much more interest in growing vegetables, and keeping pigs, cattle and poultry, than their fellows in the Assam Valley. In this respect they resemble more the people in the Surma Valley. This is the more noticeable as you go West from the East Dooars to Darjeeling. The general tendency, as you go from East to West is for the labour to be housed not so much in lines, as in separate and independent holdings, each with its own plot of ground, which is well cultivated, and appears to be exceedingly productive.

A third factor lies in the rather different nature of the countryside. In the Dooars and the Terai game is plentiful, and often in very close proximity to the actual tea plantations. The labour, specially the Paharias, are very keen shikaris, and from personal observation it was obvious that wild pig, jungle fowl, and various species of deer form a frequent and welcome addition to the normal diet, particularly at week ends. It may well be that a fair proportion of this game is obtained illegally, or in other words poached, but for our present argument this is of no import. The point is that rightly or wrongly they kill the game, and they eat it.

All these factors contribute to a better standard of diet among the labour of North Bengal as compared with that of Assam. The addition of more meat to the diet in particular means a considerable addition to the in-take of first class protein which is a serious deficiency in the diet of the Assam labourer. The better diet means less under-nourishment, and less anaemia. The incidence of hookworm, bowel diseases, and malaria, is probably very much the same as in Assam, but with a fuller diet the lost iron and protein in the blood is able to some extent to be replaced from the increased iron and protein intake in the food.

*Prevalent Diseases.*—Kala-azar, for some reason not explained, at present, seems to be more prevalent in North Bengal than in Assam. Malaria in Bengal ceases to be a problem above 2,500 feet, and it follows that on the gardens in Darjeeling, which are usually at a much higher altitude than those of the rest of Bengal or of Assam, malaria is not a problem. The diseases of Darjeeling are in the main the usual diseases of temperate climates, and chest conditions such as bronchitis, and fibrositis, are particularly common, although bowel diseases probably caused by contaminated water supply are also common, and give rise to a high mortality rate among children.

*Pulmonary Tuberculosis.*—The main problem from the health stand point on Darjeeling tea plantations is, however, tuberculosis, which is causing great concern to doctors and planters in the areas. The high incidence of tuberculosis may be gathered from figures obtained at one garden in Darjeeling. The total number of deaths on that garden during 1946 was 54, of which 20 were said to have been due to pulmonary tuberculosis. This is an extreme example, but similar figures were observed at other gardens in the area.

The reasons for the high incidence of pulmonary tuberculosis lie in two directions. Firstly the bad housing conditions and the social habits of the people, and secondly the high susceptibility of a primitive population to infection by the tubercle bacillus. The susceptibility of primitive agricultural races to tuberculosis when the germ is introduced among them with the advent of so called civilisation is well recognised. The North American Indian, the Maori, and the Australian aboriginal, are fast disappearing as the result of the introduction of this scourge of civilisation into their midst. The hill people of Darjeeling are no exception to this general rule and it is difficult to know what can be done to prevent further ravages. Better housing is no doubt an urgent necessity, but this must be combined with education in the virtues of fresh air. Another need is facilities for isolating known infectious cases. At present such facilities are virtually non-existent, and open cases of tuberculosis remain in the family circle, eating and sleeping in the same room with the other members of the family, both young and old, until they die. Since the houses they occupy have practically no ventilation, the end result can be better imagined than described. For this reason small isolation

blocks in connection with tea garden hospitals in the Darjeeling district, for the isolation of open cases of pulmonary tuberculosis, are an immediate necessity

To sum up, the main features with regard to the health of tea plantation labour in Bengal as compared with Assam, are the better state of nutrition of the population, with consequent better health as a whole, although in the Darjeeling area particularly, the mortality from pulmonary tuberculosis is a matter giving rise to the gravest concern.

## SOUTH INDIA

The general impression gained during the tour of South India was that the general health of the labour is on the whole much better than in North India. The reasons for this are difficult to define with certainty, but contributory causes are probably a higher standard of education and literacy among the labour, a healthier climate all the year round, better housing conditions, and a purer water supply. The medical and health services in the South too, are superior to those of the North and this no doubt plays its part. Frank malnutrition was very rarely seen, but one wonders whether with rations drastically reduced, mal-nutrition will not become increasingly evident in the near future, unless the position with regard to food supplies become much easier. At present planters in South India are supplementing the present ration of 8 oz. of rice, 6 oz. of pulses with such items as dried potatoes, which are most valuable in maintaining the standard of nutrition, since the local labour is sufficiently educated to utilise this supplementary ration with reasonable intelligence. When these supplies are no longer available the situation may become very serious.

The general impression with regard to the health of labour is borne out by such vital statistics as were obtained. Reference to the table at Appendix IV shows that the average mortality rate of 14 per 1,000, is lower than in any part of North India. The infantile mortality rate, 122·4 per 1,000 births is also lower, but not so strikingly so.

*Low Maternal Mortality.*—The maternal mortality rate, however is strikingly low even compared with Bengal, which is in its turn much lower than in Assam. The reason for this was very closely enquired into, since the worst feature of health conditions in the tea industry as a whole is the frightful maternal mortality. The reason is not far to seek. South India as a whole is very well provided with garden hospitals which are well run and comparatively well staffed. It has become almost universal custom to take pregnant women into hospital four weeks before the expected date of confinement and to keep them there for at least ten days after confinement. Whilst in hospital prior to confinement they are well fed, given a fair ration of milk, and generally built up to meet the demands of their approaching confinement. The result is that by the time labour sets in they are in good physical condition and usually go through the confinement with little difficulty. This in turn results in much less loss of blood than in a difficult confinement in an ill-nourished and aemic woman, so that even a day or so after labour the mother is in good shape and can be discharged from hospital after ten days. This policy of taking expectant mothers into hospital before confinement and building them up to meet their ordeal is clearly much more effective, and in the long run cheaper than admitting them only when labour has actually commenced, in a weak and ill-nourished condition, liable to hæmorrhage and collapse from their already existing extreme anaemia, and having to retain them for weeks

or even months before they are fit to be discharged. From the purely health standpoint, the South India figures speak for themselves. A walk through the maternity wards of some of the garden hospitals, in the Annamalais in particular, was a real pleasure. Healthy well nourished and happy mothers, with chubby babies weighing six or seven pounds, in marked contrast to the shrivelled, miserable looking specimens one had become accustomed to in earlier parts of the tour. It is realised that there are many difficulties in the way of universal attainment of this happy state of affairs, not the least of which is the education of the labour into the advantages of entering hospital in good time. But these difficulties have been overcome in South India, not without a great deal of trouble and patience it is true, but there seems no real reason why similar results should not be capable of achievement in other parts of India.

Otherwise there is close similarity in the prevalent diseases of South India, to those of North India. Malaria is still a problem, but has been very much reduced during the last ten years, largely due to active anti-malaria measures suggested by the Ross Institute.

Anaemia is fairly frequent, but neither so universal nor so extreme in individual cases as in North India. Kala-azar is fortunately almost unknown. Hookworm and various other kinds of intestinal worms are very common and play a large part in the production of the existing anaemia.

Tuberculosis is not infrequent, although not so common as to constitute a major problem. At first sight one wonders why South India should be so different from Darjeeling in this respect, since the terrain and elevation is similar in the two areas. The reason probably lies in the fact that in South India there is practically no 'hill' or aboriginal labour employed, the labour being imported annually from the plains below. They have therefore probably developed a fairly high immunity to the infection through succeeding generations, and through immunising doses in infancy and early childhood.

To sum up, the main features with regard to health of tea plantation labour in South India are the generally better standards of health, and the relatively low maternal mortality rate as compared with North India.

## CHAPTER III

## PRESENT ORGANISATION OF MEDICAL CARE AND STANDARD OF MEDICAL TREATMENT IN THE TEA INDUSTRY

Medical care on tea plantations in India has grown with the industry. There has been practically no planning on any rational basis, and the whole system is therefore crammed with contradictions. In fact so casual has been the development of the medical services, that the wonder is not how they function as well as they do, and many of them function very well, but how they manage to function at all.

Where medical care can be said to be organised at all, it is organised in a form which is commonly known 'as the practices'. Practices are as a rule under the care of a European medical officer, who has under his control a staff of Indian Licentiate doctors, who live and work on the individual tea gardens comprising the practice.

Practices are in the main of four types.

(i) *The Medical Association.* This is really a misnomer for reasons which will be explained. The association is formed by the combination of a number of companies, who employ a medical officer to run the medical services on all the gardens owned by the various companies in a given area. The executive powers of the association are of two types (a) vested in a committee of management, the chairman of the committee usually being the superintendent, or one of the managers, of the companies concerned. (b) vested in the hands of Calcutta Agency Houses concerned, with one representative Agency House acting as secretary. The later arrangement is preferable from the point of view of medical organisation, since both managers and medical officers can refer their difficulties direct to a more impartial Calcutta committee, where they can receive consideration on their merits, detached from local influence and politics. In neither case, however has the medical officer any great influence in the adoption of health policy on a major scale. To call the association a medical association is therefore misleading. This method of organisation has its advantages. There is a certain degree of correlation of effort, although the medical officer is often in a very invidious position. It is proverbial that no man can serve two masters. In this case a medical officer may have to try to serve a dozen masters or more with inevitable results. The main defect is that health policy tends to be directed by persons with no knowledge or training in health problems, so that long term health planning is almost non-existent.

(ii) *Private Practices.*—In this case a medical officer serves a number of companies having individual contracts with each. This type of practice is steadily becoming less in number. The advantages are that a medical officer can act in an advisory capacity and in that way can secure some correlation of effort, and if he is of strong character can influence long term policy very considerably. The great drawback is that the health policy still remains in the hands of the individual managers to a very great extent, and this is of great importance when matters involving capital expenditure are at issue. The majority of managers are still paid on a basis of a fixed salary plus percentage of profits. By the time a man reaches the position of manager he is often well on in middle age, with perhaps relatively few years in which to enjoy his position and increased income. Since his total income depends

on the amount of commission he can make through increased profits, there is a very natural tendency to cut down on expenditure which although it might be profitable as a long term policy, is not going to show any dividends during the existing manager's term of office. This affects the amount a manager is likely to spend on any long term health policy very adversely, and one was constantly being told by medical officers that the companies were always most generous in any finance required as a short term policy, but that they were equally reluctant to spend capital on schemes which might show a good return after a period of years. In one particular case a company had spent over 1,000 rupees on expensive treatment for one of their coolies who was suffering from an obscure medical complaint but refused to provide a water point inside their garden hospital, although this would probably have been repaid a thousand fold in a very few years.

(iii) *Company practices.*—These are practices where the whole of the medical practice is carried on in gardens controlled by one company or Agency. The advantages are that there is much more correlation of effort, and a long term health policy is much more capable of achievement. In general, practices of this type are run on behalf of concerns with ample capital who make large profits. The general level of medical care in this type of practice is therefore usually high, and in some cases really excellent.

(iv) *Company Practices where the medical officer is also in charge of a few outside gardens separately owned.*—The internal contradictions of medical practice in tea plantations are best seen in this type of practice. In one instance a practice was visited where the medical officer was mainly employed by one company but was also responsible for the medical care of the labour of another smaller company with several gardens. The variation in the standard of medical care in the two groups of gardens would have to be seen to be believed. One had an efficient system of garden hospitals, with a small central hospital, well equipped and staffed, and a really excellent central medical store. The other group had small, illequipped dispensaries with very few in-patient beds, staffed in some cases by merely a compounder. The medical officer, who had been in the practice for many years, was one and the same. The enormous variation could not therefore have been attributable to the medical officer, but was clearly due to a completely different out-look on the necessity for efficient medical care on the part of the different managers and companies.

*Arrangements with District Boards.*—In the Nilgiris an area was visited where a number of fairly small gardens relied for their medical care on an arrangement with the local District Board Hospital. The number of gardens availing themselves of this arrangement was 12, of which 10 were Indian owned and 2 European owned, the total population of the gardens served being just short of 4,000. Two of the gardens had a small Dispensary staffed by a qualified compounder in addition, but the remaining gardens relied solely for their medical care on the District Board Hospital. The planters pay 2 annas per out-patient attended, and 14 annas a day for in-patients. In 1946 the total sum received by the hospital authorities from the tea plantations served was Rs. 7,500 or just under Rs. 2 per head of population served. The estates are therefore getting their medical care at a very cheap rate. This would be perfectly all right if that medical care were of a reasonable standard. Unfortunately it is not. The hospital is under the care of an efficient medical officer, but as he has the normal work of the hospital to see

to, in addition to his 'tea' duties, he is naturally unable to cope with the whole efficiently. Moreover the hospital itself is antiquated and overcrowded and has only 20 beds, which are insufficient for the demands made upon them.

The idea of combination of small gardens is good, and if by correlation with the District Board Hospital an efficient medical service can be provided for the tea labour there could be no possible objection, but the present arrangement, by which the tea planters merely pass their responsibilities to their employees so far as medical services are concerned on to the Local Board, in return for a small cash payment, is by no means satisfactory and cannot be allowed to continue.

To bring the service in this particular case up to any thing like standard a new hospital with at least 40 beds would be required, in addition to at least one more medical officer and a staff of midwives and nurses.

*Relatively unorganised medical care.*—It must not be assumed that the whole of the medical services of the tea industry is organised in the ways outlined above. Such is far from being the case. The degree of organisation however, varies considerably in different parts of India. In the Assam Valley, for example, where a high proportion of the industry is controlled by large and wealthy companies and Agency Houses, some form of practice supervised by a European medical officer is probably the commonest form of medical organisation, although even in the Assam Valley it is by no means universal. The same, with some exceptions, is true of South India. In the Terai on the other hand, and to a great extent in Darjeeling the medical practice is non-existent. Individual gardens maintain their own doctor, usually a Licentiate, and he works entirely independently of the doctors on other and neighbouring gardens.

*Defects of unorganised medical care.*—The main disadvantage of this is that the doctor, unless he is very keen on his profession indeed, tends to become stale and perfunctory in the performance of his professional duties. In a 'practice' he at any rate has the advantage of discussion and consultation with his medical officer, but when he is completely isolated from his fellow practitioners, he suffers from an inevitable lack of professional mental stimulus, with ill-effects which can readily be realised. This is no imaginary state of affairs. Elderly doctors were frequently met who professionally were clearly living in the days when they first qualified 25 years ago or more. They had gone to tea gardens soon after qualification, and had remained there ever since, with no contact with their professional brethren, no one with whom they could discuss their cases, no opportunity of profiting from their own mistakes. Add to this the fact that many of them were compelled to work in well-nigh impossible professional conditions, and one may well imagine the deterioration in their professional knowledge and outlook.

*Standards of medical treatment.*—A specific example may perhaps illustrate the point more clearly. The doctor of one garden visited had been employed on the garden for 27 years. Physically he was in good shape, and mentally he was in general alert. But inspection of his recent drug purchases showed that in his last indent he had obtained several large bottles of tincture of Buchu. Tincture of Buchu is so little used now-a-days that one felt impelled to ask him why he required such a large quantity. The reply was that it was his normal method of treating gonorrhoea, which was fairly common among his garden labour. The point may not be entirely clear to the lay person, but it may be explained that since the introduction of the sulphona-



wide group of drugs, Buchu has no place at all in the treatment of gonorrhoea, indeed it is doubtful if it has ever been used for that condition by any scientific medical man during the last 30 or 40 years.

The same principle, though to a lesser degree, is shown in other therapeutic measures, particularly in the treatment of the anaemias. It is probable that a fair proportion of cases of anaemia seen on tea gardens are of the simple microcytic type and are amenable to energetic treatment with iron preparations. The best way of prescribing iron is in the form of a ferrous salt, preferably a tablet of Ferrous Sulphate. In practice most tea garden doctors prescribe mixtures containing Iron and Ammonium Citrate. Iron and Ammonium Citrate is a perfectly good method of treating the simpler types of anaemia but for the therapeutic effect obtained as compared with a tablet of Ferrous Sulphate, it is a very expensive way of prescribing iron, the ratio of cost for equal therapeutic efficiency being in the region of 1 : 20.

Much worse, of course, is the doctor, also very common, who waits until his cases of anaemia have reached an advanced and complicated stage, and then proceeds to treat them with 'blunderbuss' concerted courses of iron, liver extract proprietary tonics and vitamin preparations, perhaps re-inforced by intravenous injections of calcium. There might be some justification for this type of prescribing in the case of wealthy patients, although even that is doubtful, but there can be no justification at all for the use of such methods in tea garden practice, where what money is available should certainly be used to the best possible advantage.

Another weakness of the tea garden doctor is the tendency to use expensive proprietary preparations when standard pharmacopoeial drugs would give the same therapeutic effect at a fraction of the cost. It must be confessed that this tendency is by no means confined to tea garden doctors, but is common to Indian doctors as a whole, from the humblest village practitioner to the highly qualified hospital physician. But so far as tea garden practice is concerned, it is doubly misleading. Managers of gardens with very rudimentary medical equipment would point proudly to their annual drug bill, which might amount in some instances to Rs. 3 or more per worker per annum. It seemed unkind to have to point out that much of this money was being wasted on very expensive proprietary preparations the therapeutic value of which was to say the least doubtful. In many instances the gardens with the poorest medical equipment could show a really amazing collection of drugs, most of them proprietary preparations. The real reason for this is the defective professional education of many of the garden doctors, and the less educated the doctor, as a rule the higher proportion of proprietary preparations, since the poorly educated doctor, who is not thoroughly familiar with the official materia medica, falls an easy prey to the skilfully worded and high sounding advertisements of the manufacturer of proprietary medicines.

*Maintenance and improvement of professional standards.*—It is difficult to know how the professional standard of the garden doctor is to be improved or even maintained, but better facilities and surroundings for the carrying on of his professional work such as are outlined in the recommendations of this report will help. It was noticeable during the tour, that in some practices particularly round Jorhat, where there were well built and efficiently equipped hospitals with a properly organised central medical store and centra

laboratory, the standard of garden doctor was very high and great enthusiasm and keenness for health measures was evident. On the other hand, in other areas, large gardens with a population of 2,000 or over were seen, in which the garden hospital consisted of a tumble down basha, with no in-patient beds, no lighting or heating arrangements, no conservancy and the nearest available water supply as far as 100 yards from the hospital. As a rule that type of garden was served, if not by a compounder, by a doctor who was clearly shiftless and inefficient, although this was not to be surprised at considering the conditions under which he had to carry on his profession, which would very soon have knocked the enthusiasm out of the most ardent practitioner.

*Revision courses for tea garden doctors.*—Apart from betterment of the conditions of practice and the provision of properly equipped garden hospitals, it is suggested that close consideration be given by the Employers' Associations to the possibility of trying to arrange for periodical revision courses for tea garden doctors on the lines recently adopted by the Coal Mines Welfare Committee.

*Summary.*—It will be apparent from what has already been said that there is enormous variation in the organisation and standards of medical care, on Indian tea plantations. In some areas the standard is very high and in a few instances is comparable with medical care in any industry in the world. At the other extreme is the garden where medical care is almost non-existent or if it exists is so rudimentary as to be hardly worthy of the name.

It is here that the crux of the problem of medical care in the tea industry lies. The primary essential is to bring the backward gardens up to something approaching the standards at present obtaining in the better gardens, and this object must be kept constantly in mind in any large scale re organisation of the medical services of the tea industry.

In practice this means the setting of minimum standards of medical care on the gardens themselves, which in its turn means the provision of garden hospitals, properly equipped and maintained, and staffed with qualified professional staff. In the long run the standard of medical care anywhere rests with the doctors who are responsible for its provision, and the interest and keenness they show in their chosen profession. It is impossible to guarantee that doctors in the tea industry will show this interest and enthusiasm, but they are more likely to do so if they are provided with proper facilities and surroundings for the carrying on of their professional work.

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## CHAPTER IV.

## PREVIOUS SUGGESTION FOR THE REORGANISATION OF MEDICAL CARE IN THE TEA INDUSTRY

Suggestions have been put forward at various times during recent years for the improvement of standards of medical care on tea plantations, but no large scale reorganisation has resulted, probably due to the impossibility of embarking on any such schemes during the war years.

Copies of proposals prepared by Mr. P. J. Griffiths, Political Adviser to the Indian Tea Association, and by Professor MacDonaldis of the Ross Institute, were kindly supplied by the Indian Tea Association, and have been carefully considered in the light of information gained during the tour. The recommendations of Professor MacDonald are the result of an investigation carried out on behalf of the Indian Tea Association, and were referred to by Mr. Griffiths at the Tea Plantation Conference.

In addition to these, various recommendations have from time to time been submitted by the Assam and North Bengal Branch of the British Medical Association. The whole question was very fully discussed at the 1947 Annual General Meeting of the Branch, which was attended by Major Lloyd Jones, and although the formal minutes of that meeting are not yet available, the opinions of the Association were very clearly expressed.

In South India a valuable note on medical aid for estate labour has been prepared by Mr. L. E. Mitchell, Secretary of the United Planters' Association of South India, which embodies suggestions by Mr. R. Walker based on experience of the Kanan Devan Hills Produce Company's medical arrangements. Mr. Walker's suggestions cover the following :—

*The small primary unit* is the small estate dispensary serving a working population of 500/700 and staffed by a resident compounder, midwife, and a visiting L. M. P. There are no in-patient beds.

*The large primary unit* serves an average working population of 2000-3000, the staff consisting of a permanent L. M. P. doctor and a permanent midwife.

*The secondary unit* is the Group Hospital serving a population of 5000-7000 but which only deals with patients who have been referred from either a primary or secondary unit, and is staffed by one or more doctors, etc.

*The District Centre* is the General Hospital which serves a working population of about 50,000 and is staffed by two qualified doctors and is equipped with X-Ray, Ophthalmic and dental departments, etc.

The main skeleton of these proposals is similar in its essentials to the proposals of Professor MacDonald and the British Medical Association.

The only important criticism one has to make with regard to these suggestions is in connection with the small Primary unit, or small state dispensary. Mr. Walker envisages an estate with a working population of 500/700, that is a total population of perhaps 800/1,200. It is considered that an estate of this size should have the direct services of a registered practitioner and the sole use of at least 10 hospital beds. The best way to achieve this would be by combination with one or more neighbouring estates to set up a joint medical service with proper indoor hospital facilities.

The most recent and important recommendations are perhaps those of Professor MacDonald and of the British Medical Association.

The main principle of Professor MacDonald's recommendations consists of the establishment of group hospitals and garden hospitals. The group hospital would be a permanent structure fully staffed and equipped for the treatment of all conditions normally encountered. The plan for group hospitals would provide for ultimate expansion to at least 3.75 beds per 1,000 of population. The hospital would serve a population group comparable with that of the present larger practices, that is about 20,000 people.

The garden hospital would also be a permanent structure, and would be staffed and equipped in such a way as to be capable of providing treatment for out-patients, and for in-patients not requiring elaborate facilities for diagnosis and treatment. Professor MacDonald recommends that the number of garden hospital beds per 1,000 of population should not be less than 5.

The recommendations of the British Medical Association are in many respects very similar to those of Professor MacDonald, but there is one important exception. The British Medical Association also envisages the provision of what they call regional hospitals, which are to be equipped with every modern method of diagnosis and treatment, staffed with specialists, and capable of dealing adequately with every conceivable clinical condition. Otherwise the British Medical Association agree with the principle of the group hospital, although they prefer to call it a central hospital, and with the garden hospital. They consider, however, that the figure of 3.75 beds per 1,000 of population suggested by Professor MacDonald for group hospitals is too low and suggest a minimum of 5 beds per 1,000. They also consider the figure of 5 beds per 1,000 for garden hospitals suggested by Professor MacDonald for garden hospitals to be far too low, and suggest a minimum of 30 beds per 1,000.

There are certain other recommendations put forward by one or other of the parties, the most important being perhaps Professor MacDonald's recommendation that no practitioner should be responsible for the care of more than 2,500 people.

It is not proposed to criticise these suggestions at the present stage. They will be dealt with in the next Chapter, dealing with the recommendations for standards of medical care to be maintained.

## CHAPTER V

RECOMMENDATION FOR STANDARDS OF MEDICAL CARE TO BE MAINTAINED  
ON TEA PLANTATIONS IN INDIA

The following comments and recommendations are based upon information gleaned during Major Lloyd Jones' tour of Indian Tea Plantations.

The previous suggestions of Sir P.J. Griffiths, of Professor MacDonald of Mr. L.E. Mitchell and Mr. R.Walker of the United Planters' Association of South India and of the Assam and North Bengal Branch of the British Medical Association have been carefully considered. Suggestions which emerged from meetings with representatives of the Employers' Associations, and of the Provincial Governments concerned, have also been carefully considered and the whole taken into account in formulating the final recommendations.

## REGIONAL HOSPITALS

In India one is often struck with a general tendency to regard medical care as a matter of providing fully equipped and specialist staffed hospitals. The value of first rate hospitals, with specialist staffs, is conceded, but the main defect in tea areas (and in India as a whole), both from the economic and the humanitarian points of view, is not so much the lack of specialist hospitals as the lack of simple facilities for medical care on the gardens themselves. It would no doubt be comforting to a medical officer to know that if necessary he had a specialist hospital within reach, capable of dealing with a perforated gastric ulcer, a severe head injury, or a puzzling and obscure medical case. But the fact remains that the vast bulk of the mortality, and even more of the morbidity on tea gardens, is not caused by this type of case, but is the result of conditions arising from poor diet, inefficient sanitation, contaminated and insufficient water supply and the ignorance of the workers which are easy to recognise, and do not ordinarily require elaborate facilities for diagnosis, or highly specialised treatment.

Moreover tea garden practice is of a peculiar kind. It is not in any way comparable with industrial practice, although it is usual to refer to 'tea' as an industry. Serious accidents, such as are commonly met with in say coal mining areas, and for which special treatment provision is necessary, are infrequent in tea practice. In effect tea garden practice is essentially a type of rural practice, and must be so regarded in evolving any planned scheme of medical care.

Figures provided for one Assam practice with a total garden population of about 19,000 show a mortality rate from all causes of about 19 per thousand for one year. During that year, of the 360 total deaths, 86 occurred in the lines, and it was frankly acknowledged by the medical officer that many of these occurred without any medical treatment at all, since there were not enough beds to accommodate the patients in the garden hospital, and it was not possible to visit each case separately. This practice is by no means one of the backward ones from the point of view of medical care as a whole, and the proportion of deaths without skilled treatment must be much higher in less well organised gardens.

The medical officer concerned felt very strongly that this was the crux of the problem. On specific enquiry he replied that really difficult medical or surgical cases were very rare indeed in his practice. He doubted if he had more

than 5 genuine surgical emergencies a year. Owing to lack of a completely equipped hospital, with X-Ray plant and a proper operating theatre and specialist treatment, one or two of these might die, but owing to lack of simple means of medical care, perhaps 50 persons or even more died each year. In fact he went so far as to say that if every tea garden doctor were a Fellow of the Royal College of Surgeons, and had to work under existing conditions, he doubted if sickness and mortality would be reduced by one per cent. There is no doubt that he is quite right.

In approaching this problem we must therefore approach it from the garden end, rather than from the specialist hospital end.

*Liaison with Provincial Governments.*—Apart from the general question as to whether there is any urgent need for specialist hospitals, the question of the provision of regional hospitals for the tea industry is bound up with the hospital building programmes of the Provincial Governments. So far as Assam is concerned it is understood from the Inspector General of Civil Hospitals that the Government of Assam has already approved plans for the provision of two large teaching hospitals at Dibrugarh and Sylhet respectively.

This provision is of course long overdue, and it is a fact that at present there is not a single X-Ray plant in the whole of the Surma Valley. If we may assume, however, that the two new teaching hospitals will be established within a reasonable period of time, the necessity for special 'tea' regional hospitals is rendered very much less urgent.

The same position arises in Bengal and to a lesser extent in South India.

For these reasons, and giving due weight to the opinion and recommendations of the British Medical Association, it is considered that the provision of elaborate and costly regional hospitals is nothing like as important from the point of view of general medical care, as the improvement of treatment facilities in the garden hospitals and in the lines.

It is therefore recommended that further consideration of provision of regional hospitals for the tea industry alone be deferred.

#### GROUP (OR CENTRAL) HOSPITALS

Group, or as the British Medical Association prefer to call them, Central hospitals form part of the programme of both Professor MacDonal and the British Medical Association although the ratio of beds per 1000 of population suggested varies, being 3.75 per 1000 in the case of Professor MacDonal, and 5 beds per 1000 in the case of the British Medical Association.

Their function as envisaged seems practically the same in both cases, and is well described by Professor MacDonal as a "hospital of sound structure, built, staffed, and equipped adequately for the diagnosis and treatment of all conditions normally encountered".

It is agreed that some provision for the treatment of cases which require special treatment or investigation, at a level which would not ordinarily be provided at a garden hospital, is necessary, although nothing like as urgent a matter as the provision of a sound and universal system of garden hospitals.

*Size of hospital.*—Professor MacDonal envisages hospitals serving at population group of round 20,000 that is the hospitals would normally have a bed capacity of about 75 beds. Experience shows that a hospital of the type envisaged is not an economical proposition at a size of less than 100 beds.

Hospitals smaller than this, with highly paid, skilled and trained medical and nursing staff, cost too much in staff and other charges per bed to be economical. Generally speaking the larger the hospital the less the cost per bed, and this is true of hospitals with up to 500 beds. Beyond this size other factors enter into the question which make larger hospitals than those of 500 beds a doubtful proposition. It is unlikely, however, that hospitals of this size will ever be seriously considered for tea growing areas.

It would be a serious error to prescribe group hospitals of one specified size. The final scheme should be elastic. In practice it will be found that careful siting will be necessary and the final plan will need to be closely correlated with the topographical features and the population density of various areas.

*Bed/population ratio.*—If an efficient and universal system of garden hospitals is to be set up, the group hospital will be to some extent screened by the garden hospitals. It is therefore considered that the ultimate target for hospitals of the group type should be an all-over bed population ratio of 3 beds per 1000 of population.

*Function.*—The function of group hospitals should be as suggested by Professor MacDonald, that is they should be capable of dealing efficiently with any type of case normally encountered. They should not be used for ordinary routine treatment, and admission should only be on the recommendation of a garden doctor. Indiscriminate admission would be waste of skilled personnel and the bed/population ratio of 3 per 1000 is based on the assumption that admission would be carefully regulated.

In passing, Professor MacDonald's suggestion that group hospitals should fulfil the function of garden hospitals/for small gardens in the neighbourhood of the group hospital is not considered a good one. Such a procedure would probably result in small gardens taking unfair advantage of the close proximity of the group hospital, and neglecting to keep their garden medical facilities up to standard in consequence. Moreover, to use a group hospital, with superior staff and facilities, for the ordinary type of case which could perfectly well be treated in a garden hospital, would be a very wasteful proposition.

*Group hospitals in Assam.*—The following two examples may serve as a general illustration of the principles involved in planning the provision of group hospitals.

One Circle in Assam (Doom Dooma) has a tea garden population of about 1,20,000 and presumably the actual population density is higher than that of most other Circles in Assam. In such an area it might be found that two 175 bedded hospitals would be the most efficient and economical arrangement, since within certain limits which are not likely to be reached, the larger the hospital the less the cost per bed.

On the other hand in a smaller Circle with a population of say round 20,000 there might be no alternative to building a hospital of 75 beds, although for reasons which have been explained, a hospital of this size with highly qualified staff is not ordinarily a sound proposition. These matters, however, could only be finally decided when the general hospital plan comes to be examined in detail.

In Assam, the question of the group hospital is very closely tied up with the proposals of the Government of Assam for Provincialisation of certain Local Board Hospitals. It is understood from the Inspector General of Civ. A

Hospitals that the Government of Assam propose very shortly to establish Provincial Hospitals at Silchar, Nowgong, Dhubri, Jorhat and Tezpur. These hospitals will have specialist staff, properly equipped surgical theatre blocks, X-Ray facilities, etc., and will be expanded ultimately so that each hospital contains 200 beds.

It is clear that the immediate liaison between the tea industry and the Government is necessary in order to avoid lack of co-ordination in the general scheme of hospital planning in Assam.

The provision of Provincial District Hospitals on the lines envisaged by the Government of Assam will go a long way towards solving the problem of special group hospitals for the tea industry population. At the same time there will doubtless be areas where Provincial District Hospitals will not adequately serve the population of the tea industry. In these areas early planning of the tea industry medical organisation should proceed, bearing the necessity for tea industry group hospitals in mind.

*Group hospitals in Bengal. The Dooars.*—The Dooars is on the whole fairly well organised for medical care, and there are already at least two hospitals in existence, with plans for extension, in connection with two separate practices, which might in a sense be termed group hospitals, although their staffing and equipment is not as complete as what is envisaged for a group hospital in this report. Perhaps they could more properly be described as combined garden hospitals.

Otherwise it has been the custom to send serious cases to the Civil Hospital at Jalpaiguri, and a special financial arrangement has been in existence by which the tea industry has subscribed heavily to the hospital. This arrangement, however, has many disadvantages. The Jalpaiguri hospital is not well situated for many of the tea estates in the Dooars, and in the rainy season is often very difficult of access. Apart from this the joint control of the hospital has led to difficulties in administration, and there is widespread dissatisfaction in the tea industry with the Jalpaiguri hospital arrangements.

The tea garden population of the Dooars is over 200,000. To serve this population adequately 600 group hospital beds are necessary. The siting of hospitals to provide this number of beds will necessitate very careful planning with special regard to communications, which are often very difficult. As an initial step, however, consideration might be given to the possibility of building a 150 bedded group hospital at Mal, which is very centrally situated, is a main road and railway junction, and is fairly easy of access for most of the tea plantations in the Dooars with the exception of a few estates in the extreme East, which would be cut off during the rainy season.

*The Terai.*—The tea garden population of the Terai is not sufficient to maintain a really efficient group hospital economically, and the best solution to the problem of providing specialist care for the tea population would certainly be to combine with the Provincial Government for the establishment of a really efficient hospital for the needs of the entire population at possibly Siliguri.

*Darjeeling.*—The population of Darjeeling is very scattered and communications are particularly difficult. A single group hospital for the tea population would certainly not be a practicable proposition. The solution here, too, is co-operation with the Provincial Government for combined hospitals to serve the needs of the entire population.



*Group hospitals in South India.*—In South India, as in the Dooars, there are already in existence what might in a sense be termed Group Hospitals although their staffing and equipment is not as complete as what is envisaged for Group Hospitals in this report. They are really combined garden hospitals. Roads and other means of communication in South India are on the whole fairly good and there are also several well equipped and staffed Provincial Hospitals at Coonoor, Coimbatore, Ootacamund and other places, which are within fairly easy reach of most plantations. The 'tea' population is small as compared with Assam for example, and there seems no necessity at all at the present stage to embark on any scheme for the provision of Group Hospitals proper.

*Central Laboratories and Central Medical Stores.*—It is suggested that in both Assam and Bengal, a nucleus of group hospitals in areas where they will be required should be established as early as possible by the provision of a central laboratory and a central medical store for the whole of the group of gardens to be served by the projected group hospitals. This nucleus could then be enlarged as opportunity afforded, and would of itself be a most valuable acquisition, quite apart from the provision of actual hospital beds. The central medical store would issue drugs, and especially standard stock mixtures for the use of garden hospitals, and would certainly prove a much more efficient and economical method of drug supply than the one existing at present in the majority of gardens, where separate indents are prepared and stock mixtures dispensed, for very small units. A central medical store is the best safeguard against dishonesty in the disposal of medicines. Even in areas where it is found that the needs of a group of gardens can best be served by arrangement with the Provincial District Hospital, the provision of a central laboratory, and a central medical store, by combination of a group of adjoining gardens, is strongly recommended.

Concrete evidence of the economy resulting from the establishment of a Central Medical Store was seen in connection with a group of gardens in the Annamallais, the medical organisation of which was excellent. This Central Store supplies a group of 15 estates, with a total population of about 15000 with all their drugs and dressings. The cost per head of population in 1946 was only 15 annas.

*General specifications for group hospitals.*—The hospital should obviously be of sound construction, with impermeable and washable floors, and impermeable and washable walls to a height of at least five feet. Professor MacDonald suggests that they should be of "sound permanent construction". The general tendency in the design of hospitals now a days is not to make them too permanent. Hospital design from the functional aspect is constantly changing, and the old type of solid structure which is seen, for example in the older London hospitals is outmoded, such buildings being out of date long before they become structurally unsound. For this reason large sums of money need not be spent in the erection of buildings of heavy construction.

Group hospitals would therefore probably be best constructed in light steel and concrete, or re-inforced brick and concrete. The whole hospital should be mosquito proofed. A light ceiling leaving a ventilated air space between the roof and the rooms below would reduce the heat in summer, and make the rooms easier to keep warm in winter. These are, however, properly matters for the hospital architect.

*Main Services.*—Group hospitals should have a piped supply of pure water, electricity, telephone, and some modern method of sanitation and sewage disposal. Central heating would be a decided advantage. Water flushed closets should be provided on a basis of one for every ten beds, and one for every four isolation beds. In addition each ward, labour room, surgical dressing room, consulting room and dispensary, should have a water point over a suitable glazed sink.

*Departments.*—Each hospital should have provision for :—

Operating theatre block.

Steriliser block with high pressure steam steriliser.

X-Ray block.

Physical therapy block.

Dental treatment block.

Labour room.

Consulting and examination rooms.

Clinical laboratory, fully equipped.

Dispensary.

Administrative and office block.

Kitchen and laundry blocks.

Laboratories and bathrooms.

Stores.

Residential quarters for medical, administrative and nursing staff.

Nurses Home and small teaching and recreation block.

Mortuary and post mortem room.

Out-patients block which should preferably be at some little distance from the wards.

*Wards.*—Separate wards should be provided for :—

Males.

Females.

Maternity cases.

Small isolation wards for infectious cases.

*Allocation of wards.*—If we assume a hundred bedded hospital, wards could be allocated on the following provisional basis, although the scheme should be elastic, since what might be suitable for one area or set of conditions might not be suitable for another.

1 Male ward, surgical.	20 beds
1 Female ward, surgical.	20 beds
1 Male ward, medical.	15 beds
1 Female ward, medical.	15 beds
1 Maternity ward.	12 beds
3 Isolation wards of 2 beds	6 beds
2 Isolation wards of 6 beds	12 beds
Total :—	100 beds

*Beds.*—Beds should be of steel with mattresses and adequate bedding. Each bed should have at least 80 square feet of floor space.

*Hospital clothing.*—Hospital clothing is an absolute necessity for the type of patient that would be treated, and should consist of pyjama suits, dhoties or saris according to local custom, and the advice of the medical officer.

*Medical Staff.*—The general functions of this type of hospital have already been outlined and medical and surgical staff will have to be appointed accordingly. Experienced and specialist medical and surgical staff in sufficient numbers is likely to be a difficulty for some years. In the meantime it will be necessary to make the best use of the material that is likely to be available. The Medical Superintendent should be capable of treating medical cases with reasonable efficiency, and also capable of performing surgical operations of what might be regarded as of average difficulty. It is difficult to define the precise type of case envisaged but it might be described as the sort of operation which is usually performed by the resident surgical officer of a fairly large hospital in England. *e.g.*, straightforward hernias, appendicectomies, excision of piles, rib resections, amputations, setting of fractures, etc. The person appointed should have experience as a resident surgeon in a large hospital, and be accustomed to doing routine surgery without supervision. Academic qualifications are of secondary importance.

The remainder of the staff will perforce be governed by circumstance and availability. One should be a woman who should have some special experience in midwifery and gynaecology. One medical officer should have special training and experience in radiography, one in ophthalmology and oto-laryngology, and there should certainly be a medical officer with special training and experience in bacteriology. This will give a total of five, including the Medical Superintendent, which is the minimum staff of the hospital if work is to be carried on efficiently.

*Nursing Staff.*—Nursing staff is likely to be even more difficult than medical staff, but given a nucleus of skilled nurses, there is no reason why hospitals of this type should not be perfectly well capable of training nurses, not only for their own needs, but also for the neighbouring garden hospitals. A trained sister-tutor would of course be essential. It is for this reason that a nurses' home has been added to the list of departments advised. It is therefore suggested that the basis of nursing staff to be aimed at in the first instance should be 5 trained nurses, and 20 probationer nurses per 100 beds. Even this skeleton staff will no doubt be difficult to recruit but if it can be recruited, it should be possible to build up a good supply of trained nurses as time proceeds has already been done in most of the Mission Hospitals.

*Ambulance.*—A properly equipped motor ambulance should be maintained in connection with each group hospital.

*Summary.*—No attempt has been made to provide detailed specification for group hospitals. The main lines of development recommended have, however, been indicated.

As already stated, group hospitals for the tea industry are of secondary importance to garden hospitals, and concentration on group hospitals must not be allowed to interfere with the primary and urgent necessity, which is for a comprehensive and efficient system of garden hospitals to be completed within, say, three years. Subject to this reservation, however, the planning of group hospitals should proceed with the object in mind of 'covering' the tea population for this level of medical care in from 5 to 7 years. Not until

the plan has been carefully prepared on the ground, in close liaison with the Provincial medical authorities, will it be possible to enter into detailed specifications for individual hospitals. The plan for group hospitals is one which will call for much painstaking preliminary work, which should be undertaken preferably by some medical man thoroughly familiar with the terrain, and with local health conditions.

#### GARDEN HOSPITALS

For reasons which have already been explained, the primary essential for the betterment of medical care on tea plantations is a universal system of well equipped and staffed garden hospitals. These should function as health centres as well as treatment centres, and the medical officer and his staff should concentrate on preserving the health of the people under their care, and not merely on curing their diseases as they arise. The garden hospitals should form the first line of attack against the excessive mortality and sickness at present experienced in tea gardens.

On some gardens visited during the tour, it was stated that the labour refused to enter any kind of hospital. The fact remains that on the better equipped gardens, where hospitals are attractive, the labour shows no reluctance at all to enter hospital when necessary, and there can be no doubt that the main reason why labour on certain gardens refuses to use the hospital provided, is that the hospital is dirty, poorly equipped and generally repulsive. Professor MacDonald suggested garden hospitals to a ratio of 5 beds per 1,000 of population served, where as the British Medical Association at their 1947 Annual General Meeting considered that a minimum of 30 beds per 1,000 of population is necessary.

Considerable thought has been devoted to attempt to correlate these two widely differing estimates. It can be assumed that the estimate of Professor MacDonald has been placed much too low. As has already been indicated, the problem of medical care on tea plantations is peculiar, and is very different from a comparable problem in an urban or industrial area. On tea plantations we have what is virtually a rural population, living at present in crowded and defective housing conditions, scattered, and often reached by roads which are difficult at the best of times, and almost impassable in the rainy season. For these reasons it is difficult, and certainly would not be satisfactory from a medical point of view, to attempt to treat any of the labour sick and unfit for work in their own quarters. It is true that on many gardens this is the present practice but results show clearly that such a practice is quite indefensible, if it is in any way possible to arrange matters otherwise. In short it may be regarded as imperative in present conditions on tea gardens, if reasonable results are to be expected from the medical treatment provided, that treatment should take place in some form of hospital. This means that hospital beds sufficient to take that portion of the population which is sick and unfit for work must be provided, and for this purpose Professor MacDonald's figure of 5 beds per 1,000 of population is too low.

On the other hand the estimate of the British Medical Association is almost certainly unnecessarily high. One argument adduced by some members of the British Medical Association is that the number of beds provided at present is well over 20 per 1,000 on some gardens, and that the overall average in the Assam Valley is probably something approaching that figure. This suggestion has an element of truth, and it is a fact that in some gardens the bed provision is over 20 per 1,000. Moreover these beds are well equipped in

some cases, and the medical officers say that they do not find the number of beds available excessive. But these are the "show" gardens and are the exception.

The suggestion that the average bed provision even in the Assam Valley is anything approaching 20 beds per 1,000 has one serious fallacy. In arriving at this figure, beds which, by reason of being placed in obsolete and tumble down buildings, lacking even the simplest of equipment, and without the most essential amenities, which could not by the widest stretch of imagination be termed effective hospital beds, have been included.

It is doubtful too, if in arriving at their opinion the British Medical Association have given sufficient weight to the possibility of considerable reduction in sickness incidence following the introduction of improved scientific methods of prevention and treatment of disease, and to the recent tendency towards collective feeding of non-working children, better housing, higher wages, and concessional rates for essential food-stuffs, all of which will contribute to improved health of the labour force. The sickness experience of the last seven years can hardly be taken as a basis for formulating standards of medical care for the future, as lack of essential materials, and necessary staff both medical and lay, combined with difficulties in the supply of food-stuffs, has certainly allowed disease conditions to get the upper hand for the time being. There is no reason to suppose, however, that this state of affairs is going to continue indefinitely, and even in the absence of any improvement of the existing medical services of themselves, it is probable that the health of tea garden labour will steadily improve.

Moreover it is as yet too early to forecast the effect upon the incidence of malaria, one of the most important causes of morbidity and mortality of the more extensive use of D.D.T. and of Paludrine. It is the considered opinion of some malariologists that these two new weapons may in the course of a few years reduce the problem of malaria to very small proportions. This may well be an over-optimistic estimate, but there can be little doubt that these preparations will be of immense value in reducing sickness and death from malaria.

What is really required is that every tea garden in the industry should have enough beds at its disposal to deal with its own sick. In practice this means bringing gardens with little or no medical care at present, up to a reasonable standard, comparable with what is already in existence on the better type of garden. In order to do this, and bearing in mind the present shortage of building materials and skilled labour, the shortage of doctors and nurses, the difficulty of communications in most 'tea' areas, quite apart from the financial considerations involved, the standards in the initial stages should be minimum standards, and should be such as could reasonably be expected to be provided within a fairly short period (say three years). It may well be that some gardens already have a medical organisation at a higher level than the proposed minimum standards, but there is no reason to suppose that these companies would allow their gardens to deteriorate to the lower level, since their present standards have been evolved on an entirely voluntary basis.

*Bed population ratio suggested.*—Taking the whole of the above remarks into consideration, it is recommended that a minimum standard of 10 effective hospital beds per 1,000 of total population should be provided in tea garden hospitals, and that statutory powers of enforcement of this standard should be obtained.

*Combined Garden Hospitals.*—In suggesting an overall minimum standard of 10 effective garden hospital beds per 1,000 of population it is not intended that each individual garden should necessarily have its own garden hospital situated on the garden itself. For example there may be a group of 6 small gardens, situated in close proximity to each other, each with a population of shall we say 500, or 3,000 in all. Whilst 6 separate garden hospitals, each of 5 beds, might prove satisfactory, it would almost certainly be preferable for the gardens to combine and set up a garden hospital with 30 beds, which would meet the needs of them all, provided roads connecting the gardens were satisfactory, and distances were not too great. Such an arrangement would be much cheaper, and in the long run would probably result in a higher standard of medical care. An intermediate arrangement might even be preferable in which each garden would have a small dispensary, and say two detention beds, with a hospital of say 20 beds to meet the common needs of all the gardens. The most efficient and economical arrangement would vary according to circumstances and it would be for the planters in different areas to co-operate and decide which would be the most satisfactory and efficient organisation. In other words, if legislation is passed, it should provide some degree of latitude in the provision of garden hospital beds, provided each garden can show that it either has on its own land, a hospital meeting the statutory requirements, or has a lien on hospital beds on a neighbouring garden or in a District Board or other similar hospital to the scale of 10 beds per 1,000 of total population.

*Ambulance for larger combined garden hospitals.*—In connection with larger combined garden hospitals the provision of a motor ambulance would probably be well worth while, and could be paid for from the saving resulting from combination of effort.

*Small gardens in Darjeeling.*—Darjeeling provides a special problem so far as the provision of garden hospitals is concerned. The two special features of the tea industry in this area are the small size of the gardens and the difficult nature of the country from a communications point of view. It is no doubt the topographical nature of the country, spurs of high altitude divided by deep ravines, which is the prime cause of the small size of the gardens, the majority of which have a population of less than 900. The nature of the country gives rise to another difficulty, which is that gardens only separated by a mile or two as the crow flies, may be several hours' journey apart in actual travelling time. For this reason any combination of small gardens to form a single unit for purposes of medical care is not going to be easy, and in the case of Darjeeling careful planning of the medical organisation and of its staffing from the point of view of combination of effort, is an absolute necessity. It is suggested that the best plan would be for one or two full time administrative medical officers to be appointed by the Darjeeling Planters' Association to formulate a comprehensive plan in the first instance and later to be responsible for the smooth running of the medical organisation of the whole area covered by the Association.

*Small and inaccessible gardens.*—There are scattered here and there throughout the tea areas of India, a few small gardens or out-gardens which are so situated that it would not be possible for them to combine with neighbouring gardens to provide a joint garden hospital, or to employ a joint medical officer. In the rainy season they may be entirely cut off by swollen rivers, etc. and the difficulty is by no means one of mere distance as the crow flies. It would be uneconomic to compel a small garden of this type to maintain a registered doctor in view of the present shortage of doctors in India. India



**Figure 1.** An illustration of the difficulty of communications in tea growing areas. When this bridge is washed away each year during the rains, the estates on the far side of the river are completely isolated by road and rail.

simply cannot afford to spare a registered doctor to look after 500 people or less. It is essential nevertheless, that the people on such gardens should have the best provision possible for their medical care, and it is considered that this could be best achieved by compelling such gardens to maintain a dispensary, with up to five detention beds, under the immediate care of a qualified compounder, but supervised and visited regularly by the nearest garden doctor. It may be reiterated that this does not mean that because a garden is small it should be staffed by a compounder. The correct course for the small garden is to combine with a neighbouring garden or gardens to maintain a proper garden hospital. It is only when a small garden is liable to become completely isolated for long periods that the employment of a compounder to be responsible for medical care, under the supervision of the nearest garden doctor, should be countenanced.

*Very Small Gardens.*—Very small gardens with a total resident population of less than 50 do exist. It is suggested that in any proposed legislation, the definition of a tea plantation should exclude gardens with a total resident population of less than fifty.

*Function of the garden hospital.*—The general function of the garden hospital should be to deal with out-patients, and treat in-patients not requiring any elaborate procedure for diagnosis and treatment. The vast bulk of sickness in tea plantations is of this type. In addition provision should be made for the treatment of infectious cases, for midwifery, for simple ante-natal, and post-natal care and for infant and child welfare. Infant and child welfare is already provided for on many gardens with striking results. The garden hospital should also be regarded as the health centre for the area served and regular inspection of the population of the garden, quite apart from mere treating of those who report sick, should be carried on from the garden hospital as a base. This is also being done in some of the better gardens at present and results are reported to be most gratifying.

*Shape and lay-out of wards.*—In planning garden hospitals great care should be taken to ensure that wards and other rooms are planned so that the greatest possible efficiency is gained with the greatest economy of space. The best shape for a ward in a small hospital of this nature is oblong, the beds being placed with their heads to the longer walls. If three feet of space is allowed between each bed, and a six feet wide "corridor" between the feet of the beds on either long wall, it will be found that the floor space per bed works out at a little more than 60 square feet per bed, which is a fair allowance. No bed should have its side against a wall. This of course makes for great economy in space, but is unhygienic.

Attention is drawn to this matter of shape of wards, since several new hospitals were seen under construction, in which little or no thought seems to have been given as to how the beds were going to fit into the ward. One otherwise excellent ward had been built 45 feet square. A little reflection will reveal the difficulty of fitting beds into a ward of this size and shape without unnecessary waste of space.

A diagrammatic sketch plan of a tea garden hospital with 20 beds to serve a total population of 2,000, is placed at Appendix V.

*Construction.*—In order that the hospital should be efficient and attractive to the labour it is essential that they should be of sound construction. They should have impermeable washable floors, and the inside walls should



be washable to a height of at least 5 feet. This can be done by applying a thin layer of Snowcrete or some similar material. The design should ensure that the buildings are reasonably cool in summer and easily heated during the winter months. Probably the best way of ensuring this is to so arrange the building that all the rooms in use have a separate ceiling, so that there is ventilated air space between the ceiling and the roof proper. As soon as the necessary material becomes available the whole of the wards and other rooms in regular use should be rendered mosquito proof.

The type of construction will depend on various circumstances, chief among which is perhaps the availability of material. In some parts of Assam good clean sand for concrete is not obtainable locally, and has to be imported at heavy expense. In some areas bricks are locally made and are relatively cheap.

By courtesy of Messrs. Balmer Laurie, Ltd., whilst in Calcutta a new form of building construction was seen at the Western Cardboard Box Co., Behala. This consists of walls of concrete laid on to bamboo lathing hung in rolls, thus lessening the amount of steel necessary for a steel concrete building. The plinth and pillars are of orthodox construction. The roof is of similar construction to the wall panels, but being much lighter than the orthodox form of construction can be built up on light frame work formers. The completed building appeared to the lay eye to be very similar to an orthodox steel and concrete building, except that the walls and roof were much thinner. It is said that building of this type is no more expensive than the more orthodox type of construction, and it has the great advantage that local material, namely bamboo, replaces a considerable amount of steel, and that the erection can be carried out by semi-skilled labour and is much quicker than other forms of construction. The factory which was seen was 200 ft. by 100 ft. and had been completed in just under three months.

If further experience shows this type of building to be durable, it might well prove the best and fastest method of erection of hospitals and coolie houses in tea estates.

Construction is however, a matter for the hospital architect, but the urgency of the problem, combined with shortage of supply of concrete, steel, and skilled building labour must be borne in mind in the preparation of building schemes.

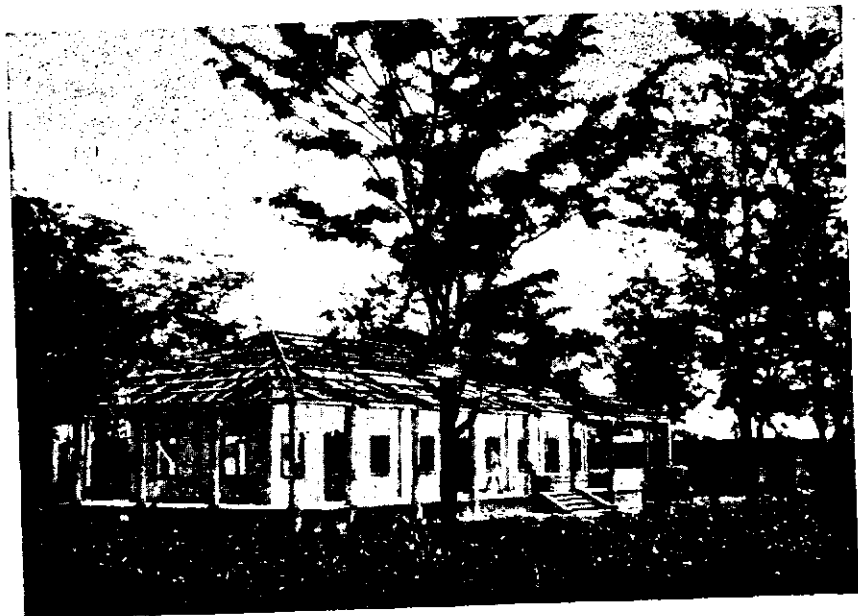
*Main Services.*—Each garden hospital should have a pure piped water supply, and the wards, consulting room, theatre and dispensary should each have a water point over a suitable glazed sink.

Electricity should be supplied whenever a supply is available on the garden.

Water-flushed closets with septic tanks should be provided on a scale of at least one closet for every six beds.

Bathing arrangements are at present almost non-existent in many areas. Shower baths should be provided on a scale of at least one to every six beds.

Some form of heating is necessary in most areas for the winter months, and central heating has many advantages. The opinion of the doctors interviewed, however, was about equally divided on the advantages of central heating as against ordinary open fires. If open fires are provided, they should be of good design, so that they really function for the purpose for which they



**Figure 2.** A tea garden hospital under construction in the Doocars.

are intended, which is more than can be said for most of the fireplaces at present existing in garden hospitals.

*Departments.*—The following departments will be required :—

1. General ward for males.
2. General ward for females.
3. Maternity ward with separate labour room.
4. Infectious ward with separate sanitary arrangements.
5. Out-patient department with sufficient waiting space for patients to wait under cover.
6. Consulting room so arranged that patients can be examined in complete privacy.
7. Minor operation and dressings room.
8. Dispensary and drugs store.
9. General store.
10. Lavatories and shower baths.
11. Kitchen for cooking (Mosquito proofed).
12. Child welfare block.

*Out-patient Department.*—The out-patient department should preferably be situated in a separate block from the general wards. In many existing garden hospitals the out-patients wait on a verandah which is common to the consulting room and the wards. It was quite common to see a horde of out-patients, with their children and friends, wandering in and out of the wards in which were patients extremely ill, women having just been confined and in some instances highly infectious cases. The undesirability of this is obvious.

*Allocation of beds.*—The allocation of beds may vary in different areas in accordance with local conditions and the individual opinion of the medical officer, but as a general illustration we may take a garden hospital of 20 beds which according to the bed-population ratio already suggested, would serve a population of 2,000. Such a hospital should have a small ward of 4 beds, or even better 2 small wards of 2 beds each, reserved for maternity, ante-natal, and post-natal cases. This is essential if any marked reduction of the present frightful maternal mortality is to be achieved. Six of the remaining beds should be maintained in a separate isolation block of three 2-bedded wards, with separate services, for infectious (usually bowel) cases. The isolation block need not be at a great distance from the main hospital. This is quite unnecessary, and makes for difficulty of management and supervision. Hospitals were seen in which an isolation ward was as far as 300 yards from the main building, which is absurd. It should be explained, however, that this isolation block is not intended for use in case of epidemics, of infectious disease such as cholera or smallpox. An epidemic of this nature should be dealt with by erecting a temporary building specially for the purpose and this should be well away from the main hospital or any other building. To return to our bed allocation, the remaining ten beds would be available for general medical or surgical cases as necessary, and should be arranged in two wards, one for males and one for females.

*Floor space of beds.*—Each bed should be allowed at least 60 square feet of floor space. Compared with most of the garden hospitals seen this is a

fairly generous provision, but it is not too generous if reasonable comfort is to be secured. It also has the advantage that in any emergency extra beds can be put into wards if absolutely necessary.

*Medical staff.*—Each garden hospital should be under the care of a registered medical practitioner. The present doctor population ratio is probably somewhere round one doctor to 1,900 of population, but this includes gardens where the so-called doctor is not a registered medical practitioner. Enquiry during the tour showed that on gardens with a total population of up to 2,500, one doctor could cope with the work efficiently and well. Under the Workmen's State Insurance Bill, a doctor/population ratio of 1/2,000 has been provisionally adopted. The area of practice of the average tea garden doctor, however, will be less than that of the average Health Insurance Doctor, and he will have more assistance. It is therefore considered that the overall scale of provision of doctors should be one registered doctor to not more than 2,500 of total population which is the same figure as suggested by Professor MacDonald.

*Nursing Staff.*—Nursing staff for garden hospitals must necessarily remain on a skeleton basis for the present owing to the shortage of trained nurses of any kind. As group hospitals become established, however, and as Government schemes for the training of nurses develop, the supply should steadily increase. The immediate object should be to get at least one nursing attendant, male or female, with as adequate a training as possible, per 1,000 of total population; and one trained dai or midwife, for each 2,500 of population. As registered nurses and midwives become available, they should replace the semi-trained staff, although it would probably be advisable to retain the latter in addition to the registered staff for general health duties.

During the tour it was stressed by many medical officers that it was impossible to get girls to train as nursing attendants. The most cogent argument against this is that on some estates in each part of India visited, nursing attendants have been recruited either from the garden population itself, or from its immediate neighbourhood, and after simple training in the garden hospital have proved very useful and in some cases most efficient. Missionary hospitals too, seem to be able to recruit women and girls in fairly large numbers for their own work, and shortage of nurses was not complained of at any of the four or five missionary hospitals visited during the tour. It is feared that the main reason why women and girls on tea plantations are reluctant to offer themselves for service as nursing attendants is that the existing hospitals are generally so primitive in their construction and management, that there is no sort of dignity attached to the position of nursing attendant. If garden hospitals are raised to a better standard, and a fair rate of pay is given to women volunteering, it is felt that this fundamental objection can be overcome.

Male nursing attendants, usually army trained, were seen on several gardens in South India, and were said to be eminently satisfactory.

In any case some alternation of the present state of affairs in many garden hospitals, where the patient is looked after so far as the necessities of life are concerned by a horde of relatives, many of whom are thus prevented from doing their normal jobs on the garden, with their attendant children and families, who crowd out the hospital wards, and bring in with them all the dirt and filth inseparable from every day life on the garden, is absolutely imperative. This will mean educating the labour no doubt, but since the

system of family attendants has been abolished on many gardens in every area visited, it can be abolished in the remaining gardens, provided the medical officers and others concerned make a real effort to do so.

*Compounders.*—A qualified compounder is necessary in each garden hospital.

*Anti-malaria Assistants.*—An anti-malaria assistant is essential in most 'tea' areas, and should be attached to the garden hospital.

*Sanitary Inspector.*—Where a fairly large number of gardens combine to set up a combined garden hospital and health service, the addition of a trained sanitary inspector to the staff would certainly prove well worth while.

*Laboratory Assistants.*—If the group is large enough to warrant the appointment, a trained laboratory assistant would be most useful, and would relieve the doctor of some of his routine examinations and thus provide more time for other and important work.

*Equipment and Drugs.*—A suggested list of equipment and drugs is placed at Appendix VI. Suggested figures are given for 10 bedded and 20 bedded garden hospitals. The total quantity of individual drugs to be subsequently maintained will naturally vary from area to area, and even from garden to garden. As and when Central Medical Stores become established as previously recommended, these figures will become subject to considerable variation, and it will be possible to make relative reductions in the quantities suggested, particularly in the case of drugs which are infrequently required, but of which stock must be kept in case of unexpected demand.

*Beds.*—Beds should preferably be of steel, with mattresses and adequate bedding. The type of mattress will vary according to local custom and habit, but they should preferably be of simple type. Perfectly good mattresses filled with rice straw were seen in Assam, which were cheap to produce, and could be burned if they became dirty or infected.

*Hospital clothing.*—At present patients entering hospital as a rule wear their own clothing which is almost invariably filthy. The undesirability of this from a medical standpoint, apart from the point of view of the comfort of the patient, needs no stressing. Nothing elaborate is required. Simple pyjama suits, dhoties, or saris, according to local custom and the recommendation of the medical officer, should be provided and their use made compulsory. Immediately on admission to hospital patients should be bathed, and clean clothing supplied. Their old clothing should then be sent for cleaning and sterilisation.

*Summary of suggested minimum standards.*—The following is a summary of the suggested minimum standards for garden hospitals embodied in the present Chapter:—

Garden hospital beds/total population not less than	10/1,000
Registered Medical officers/total population not less than	1/2,500
Midwives or dais/total population not less than	1/2,500
Nursing attendants (male or female)/total population not less than	1/1,000
Compounders/total population not less than	1/2,500
Anti-Malaria assistants/total population (where malaria is prevalent) not less than	1/2,500

## CHAPTER VI

## ESTIMATE OF THE PROBABLE ANNUAL COST OF MEDICAL CARE TO THE STANDARD NOW RECOMMENDED

*Suggested figure of Rs. 10 per worker per annum.*—At the first meeting of the Tea Plantation Labour Conference it was suggested by the Government of India that medical services should be provided on a scale which would cost about Rs. 10 per worker per annum.

It is not clear whether this sum was intended to cover interest and depreciation costs on initial capital expenditure for hospital and dispensary buildings and equipment. Nor is it known whether, in arriving at this figure the Government took into consideration that the medical services on tea plantations cater for the whole population, and not merely for the workers themselves. In the case of tea plantations this is usually unavoidable, since most gardens are placed so that access to existing provincial medical services is well nigh impossible. In fact this is probably one of the main reasons why the existing medical services on tea plantations came into existence.

Medical care on tea plantations therefore differs from medical care in industry as a whole, since in the ordinary industrial area there are already in existence Provincial or Local Board medical facilities, which can cater for the needs of the workers' families, and which although very inefficient are as a rule fairly easily accessible.

The suggested sum of Rs. 10 per worker does not by any means represent the amount which would be available for each person for whom the medical organisation to be set up would be responsible.

The ratio of working to non-working population on tea gardens varies considerably. In some gardens the working population is less than half of the whole, whereas in others the working population may be as much as 75 per cent. of the whole. But a fair average would probably regard the working population as forming from two-thirds to three quarters of the whole garden population, and figures were collected during the tour which substantiate this statement.

It is thus clear that the estimated sum of Rs. 10 per worker really means that the sum available per annum for medical care for each person to be treated is actually something between six and seven rupees.

It can be stated at once that to provide a really satisfactory standard of medical care, including even a minimum of hospital beds, for this sum is impossible, if the cost of new buildings and initial equipment is to be taken into account. If the sum allowed were Rs. 10 of total population instead of Rs. 10 per worker, it might be just possible, but even then there would be little margin to cover times of exceptional sickness, etc.

*Cost of Provincial Medical Services.*—It is feared that there is at present in India a tendency to under-estimate the cost of an efficient medical service. This tendency has probably arisen from the very meagre sums which have been spent in the past by Provincial Governments and District and Local Boards on such services. It is believed that no Provincial Government at present spends more than one rupee per head of population on medical services, and even in more densely populated and better served areas, such as in the vicinity of large towns, etc., the amount spent rarely if ever exceeds

**Rs. 2 per head of population.** People who have no proper understanding of the true position therefore tend to assume that a satisfactory medical service can be set up for this sum, which is far from being the case. The plain fact of the matter is that the services already mentioned costing Rs. 2 per head per annum or less, are medical services in name only. No one who has attended the ordinary Dispensary, provided from public funds, as a patient will dispute that in the overwhelming majority of cases they are hopelessly inadequate and inefficient. Instances are well known to the writer where professional equipment is almost non-existent, and where the doctor in charge is expected to examine and treat as many as three hundred or more patients in a day.

The Bhoze Committee Report states that "the average time devoted to a dispensary patient may be as short as three quarters to one minute".

Medical care at this level can of course be provided very cheaply, although actually it is not medical care at all, but mere charlatantry.

*Cost to individual companies.*—So far as actual cost to individual companies is concerned many factors will affect the figures. For example, many gardens already have hospital buildings, medical and surgical equipment, initial stocks of drugs, etc., which fall very little short of what is now recommended. Some gardens, of course, are even ahead of the present recommendations. These gardens will need to spend very little more, if any than they are spending now.

Gardens which have little or no provision at present, however, will have to start from scratch, and their initial capital expenditure on hospital buildings and initial equipment will naturally be heavy.

Larger companies employ a certain amount of skilled labour in connection with the manufacture of tea, and a fair proportion of the equipment needed and even of the actual buildings required, can be provided during the quiet season, utilising labour normally employed on the garden, at very much less cost than would be entailed if skilled labour had to be imported for the express purpose of erecting hospital buildings, making hospital furniture, etc.

All these factors will affect the cost on individual gardens a great deal.

*Capital expenditure.*—Utilising the facilities normally available on an average sized garden it is estimated that a suitable garden hospital to meet the needs of a total garden population of 2,000 people, on the lines of the sketch plan at Appendix V, could be erected for about Rs. 40,000. Add Rs. 12,500 to cover initial medical and surgical equipment to the scale suggested at Appendix VI, which gives an approximate total expenditure of Rs. 52,500 for initial capital outlay. Allowing for interest and amortisation at 6 per cent. per annum, this represents an annual charge of about Rs. 3,150 or about Re. 1 annas 9 per head of population served.

*Annual cost.*—The total cost of running a garden hospital for the same population of 2,000 at a scale a little higher than the minimum prescribed would vary according to the seniority of the staff engaged, and certain other factors but in an average case would probably be something as follows:—

		Rs.
1 Medical officer	Rs. 200 per month	2,400
1 Compounder	Rs. 75 per month	900
2 Nursing Attendants	Rs. 50 per month	1,200

1 Trained Dai	Rs. 60 per month	Rs. 720
1 Cook	Rs. 40 per month	Rs. 480
4 Inferior Servants	Rs. 30 per month each	Rs. 1,440
Drugs and dressings	Rs. 1-8-0 per capita	Rs. 3,000
Replacement of hospital clothing, bedding, etc., say		Rs. 1,000
Food for in-patients		Rs. 2,500
Heat, light and sundries		Rs. 4,00
		<hr/>
	Total	Rs. 14,040

Very roughly estimated, the total recurring annual cost of running the medical services for a tea garden population of 2,000 persons, at a scale rather higher than the minimum prescribed would therefore be approximately Rs. 14,040 or about Rs. 7 per head of population served.



## CHAPTER VII

ACCEPTABILITY OF THE PRESENT RECOMMENDATIONS TO THE EMPLOYERS  
ASSOCIATIONS AND TO THE PROVINCIAL GOVERNMENTS

During the tour of Assam and North Bengal summaries of findings up-to-date, and of provisional recommendations were prepared and submitted to informal meetings of representatives of the Provincial Governments, the Assam and North Bengal Branch of the British Medical Association and the various Employers' Associations; namely the Indian Tea Association, the Assam/Bengal Tea Planting Association, the Indian Tea Planters' Association, Jalpaiguri, the Terai Tea Planters' Association and the Darjeeling Tea Planters' Association. Copies of the draft recommendations thus circulated are placed below at Appendix I. It will be seen that the main feature of the drafts is concentration on garden hospitals, and certain suggested numerical standards are put forward. At the time of preparation of the draft recommendations it was considered that since the general health of the labour population in Bengal was on the whole better than the health of the labour population in Assam, there might be some relaxation of standards so far as Bengal was concerned. The main items of difference are shown below:—

*Suggested minimum standards.*

	ASSAM	BENGAL
Garden hospital beds per 1,000 of population	12	9
Medical Officers (Registered)	1/1500	1/1750
Midwives or dais	1/1500	1/1750
Nursing attendants per 1,000 of population	1	1
Compounders	1/1500	1/1750

Further consideration and closer examination of the figures and statistics prepared after return to New Delhi, have led to some variation in the suggested standards although the main principles remain the same.

In the first place if legislation is introduced to enforce the suggested standards it would be much simpler if it could be found possible to adopt a universal standard for the whole of the area to be covered by the proposed legislation. Considerable thought was given to see if this might be possible and eventually it was decided that it was not only possible, but that on the actual facts when worked out in greater detail, such a course was undoubtedly the correct one.

*Bed/population ratio.*—It is certainly true that the general standard of health in Bengal is better than that of Assam. But careful examination of the principal diseases in Bengal show that they are such as normally demand a higher degree of hospitalisation. It is fairly certain for example that Kala-azar, for some reason unexplained, is more frequent in Bengal than in Assam. Kala-azar is a chronic complaint necessitating long stays in hospital if the best results are to be achieved. In Darjeeling in particular, pulmonary tuberculosis is exceedingly common, and although accurate figures are not obtainable, it is very probable that from 1 to 2 per cent of

the whole population has active pulmonary tuberculosis. These cases should certainly be isolated in order to prevent spread of the disease, and for this purpose a larger number of hospital beds must be made available.

It is therefore clear that although the total incidence of sickness is less in Bengal than in Assam, the diseases which are prevalent are diseases which ordinarily demand longer periods of hospitalisation, and therefore a larger number of beds. For this reason it is considered, after mature consideration, that the bed/population ratio in Bengal should be the same as in Assam.

In making the original provisional recommendations of bed/population ratio in Assam, it is doubtful, on more detailed consideration, if sufficient weight was given to the probability that the health of the labour would improve, and indeed is already showing indications of improvement. Much of the present ill-health is due to conditions the aftermath of the war, the causes of which have either been removed or are in course of removal. It is reasonable to assume that there will be a steady decline in the incidence of malaria and of mal-nutrition, to mention only two of the important causes of sickness and disability in Assam.

It is therefore considered that the minimum bed/population ratios provisionally suggested for Assam and Bengal should be amended, and should be fixed at 10 beds per 1,000 of total population for both Provinces.

So far as South India is concerned the over-all standards are already superior to those now being suggested, and there should be no difficulty for the few gardens below the standard to bring their medical services up to the same standards as for Assam and Bengal.

*Doctor and staff population ratio.*—For reasons already stated the original draft proposals envisaged a doctor and other staff/population ratio varying in the two Provinces of Assam and Bengal. Further consideration has also been given to this point. Professor MacDonald suggested a doctor/population ratio of one doctor to not more than 2,500 people, and in view of the fact that a tea garden doctor will be practising in a relatively small area, with hospital beds at this disposal, and with a fair amount of trained assistance, this is considered reasonable as a minimum standard. The remaining staff attached to a garden hospital should be adjusted accordingly.

Taking all these factors into consideration, it is therefore considered that the minimum standards to be prescribed should be as given in Chapter V, and may be summarised as under :

Garden hospital beds total population not less than . . . . .	10/1000
Registered Medical officer total population not less than . . . . .	1/2500
Midwives or dais/total population not less than . . . . .	1/2500
Nursing attendants (male or female)/ total population not less than . . . . .	1/1000
Compounders, total population not less than . . . . .	1/2500
Anti-malaria assistants/total population (where malaria is prevalent) not less than . . . . .	1/2500

*Views of Employers' Associations.*—At the various meetings with the Employers' Associations no objection was raised to the general principle involved in the proposals, and informal enquiry has subsequently been made as to the present amendments. It is understood that the present proposals are provisionally acceptable to the Employers' Association, with the exception of the Indian Tea Planters' Association, Jalpaiguri, whose views are summarised and discussed below.

*Views of Indian Tea Planters' Association, Jalpaiguri.*—Although other Employers' Associations provisionally approved the draft proposals submitted to them, the Indian Tea Planters' Association, Jalpaiguri, were not in agreement. Discussion with that Association took place at a meeting held in Jalpaiguri on the 28th of April when the views of Major Lloyed Jones, and those of the Association were very freely exchanged. The views of the Association have since been clearly stated in a memorandum, an advance copy of which, kindly supplied by the Hon'y. Secretary, Mr. B.C. Ghose, is placed at Appendix II.

The main case of the Association is based on two fundamental issues.

(i) That the liability of the employer in industry should be confine to special hazards arising out of particular occupation. The Bhoze Committee report is quoted in support of this contention, and it is submitted that the only possible special hazard peculiar to the tea industry is in connection with maternity, as the women workers have to work in the open.

(ii) That since it is Indian custom to have medicines by the bedside in one's own home, rather than go to hospitals, concentration should be on outdoor medical services.

In view of these two contentions, the Association submit that the following should be the minimum standards to be prescribed.

*Beds.*—Basing their case on the ten year programme of the Bhoze committee, the Association contend that the following should be the bed provision.

- (a) Group hospitals for population groups of 40,000 to be provided on a scale of 2 beds per 1,000 of working population. The hospitals to be erected out of Government funds, but the bulk of the subsequent maintenance costs to be borne by the tea industry.
- (b) Gardens of less than 500 working strength to provide no indoor beds.
- (c) Gardens with a working population of over 500 to have garden-hospital beds to a scale of 3 beds per 1,000 of working population.

*Staff*—(a) Estates employing less than 50 labourers to have no liability.

(b) Estates employing more than 50 but less than 500 to have an unqualified doctor with periodic visits by a registered doctor.

(c) Estates employing more than 500 to have one registered doctor for every 1,000 of working population.

There are various other minor suggestions, but the above constitute the most important features of the memorandum.

The question as to the assignment of financial responsibility for medical care for different sections of a community is a sociological/political one, upon which opinions differ according to the political complexion of the holder, and it is not proposed to enter into the pros and cons of government responsibility for medical care here. But even if it is held that the only responsibility of an employer towards his labour from the point of view of medical care is special hazards arising out of the workers occupation, it seems clear that in the case of the tea industry such special hazards can by no means be restricted to additional risk in connection with maternity.

In this connection it is necessary to go back a little way into the history of the tea industry. The industry in general was started in areas where the indigenous population was quite insufficient to provide the necessary labour for its successful operation. It therefore became necessary to import labour from distant parts of India in order to carry on the work on the gardens, and during the last hundred years or so many millions of such labourers and their families must have been uprooted from their original surroundings and transported to tea growing areas. Even now the local population is still insufficient in numbers to meet the evergrowing demands for labour, even taking into account children born and brought up on the gardens, and recruiting organisations are still very active in recruiting fresh labour from distant parts of India.

No one would pretend that the labour was brought to the gardens for any reason than to increase the production of tea, and to bring profit to the tea owners. Since the labour is imported for this specific purpose, no reasonable person would deny that the owners who imported the labour have a moral responsibility to see that the labourers and their families are guaranteed decent and human standards of living. Otherwise their conditions would be reduced to one of mere slavery. It would be easy to make out a case for the contention that the condition of tea labour in years gone by has been very little if any better than slavery but the moral obligation upon the owners still remains, even if many of them in the past have neglected to observe that obligation.

What are the main requisites for the preservation of a decent standard of living among tea garden labour? Housing, proper food and water supply, clothing, are items which leap to the mind immediately. But in addition to these, we must add medical care. The herding together of thousands of ignorant, illiterate, poverty stricken people leaves no possibility of medical care arising spontaneously in response to the normal laws of supply and demand. The wage of the average family of tea labour up till very recently has been hovering round the mere subsistence line, and left no margin for expenditure on such extras as medical care, provision against old age, and other similar amenities which have come to be regarded as the normal rights of human existence in almost every country except India.

It is not difficult to take the matter even further. Malarialogists are agreed that the bulk of the malaria infection in India can be termed 'Man-made'. Interference with topographical features and normal drainage of the country for commercial gain has encouraged conditions in which the malaria carrying mosquito can breed and multiply to the very best advantage. This is especially true of the tea industry. The transfer of what was previously a purely rural population into insanitary, badly drained, ill-ventilated, coolie lines has resulted in the establishment of enormous pools of infected population, so that every mosquito existing in the area which is potentially a malaria carrier, becomes one in actual fact. The responsibility for this state of affairs can be laid at one door and one door only, and that is at the door of the employers in the tea industry. They, and they alone are responsible. They have caused these conditions, and for a very long time many of them have been content to sit quietly and make no attempt to reduce the ill-effects of their commercial operation. Since the responsibility for causing these conditions lies with them, it is clearly equally their responsibility to see that the ill effects of the artificially produced conditions are minimised in every possible way. It is futile to pretend, as many do,

that the industry cannot afford to maintain decent living conditions, including standards of medical care for its labour. If the industry cannot afford to do this then it has no right to exist as an industry. This is freely acknowledged by the vast majority of tea planters at the present day, but there are still a few of the old school left whose only aim in life is to show profits, no matter at what cost to the labourer who produces these profits.

It will therefore be seen that the contention of the Indian Tea Planters' Association, Jalpaiguri, that the only special risk which a tea garden labourer is liable to is maternity is indefensible. If this is conceded a large proportion of their case falls to the ground, since presumably the standards of medical care they envisage are based upon the presumption that the only special risk is maternity.

The second main contention so far as principle is concerned is that since it is Indian custom to be treated medically at home, concentration should be made on outdoor medical services. Hospital provision on a large scale is of relatively recent growth all over the world, and is a product of advancing civilisation. In primitive communities everywhere, hospital services are unknown, and in this respect India is suffering as she is in so many other respects, in that her civilisation, whether it might have been a thousand or more years ago, has advanced very little during the last three hundred years so far as the mass of the population is concerned. This is not confined to medicine and other social services. It is true of agriculture and many social customs, which are the same now as they were in the time of Akbar the Great. Because a custom is old does not mean that it is necessarily good, and should be continued for ever. It is the custom of many Indian tea labourers to defecate in all sorts of unlikely places, but no sensible person would say that it is a good custom. Where ancient customs are obviously bad, and particularly when they are harmful to the health of the community, attempts should be made to alter them by people who have sufficient education and understanding to know better.

This is particularly applicable to the issue in question. There is no doubt that the majority of tea garden labourers, who have no experience of hospitals, are reluctant to go into hospital even when they are extremely ill. But experience also shows quite definitely that if the matter is explained to them, they can be educated into seeing the many advantages of being treated in a hospital under proper conditions. The Indian peasant may be illiterate and ignorant, but he is by no means lacking in intelligence, and when a thing is pointed out to him he is very quick to realise its implications.

There are, however, two pre-requisites, firstly that the hospital staff shall treat the sick coolie as a fellow human being. Except in the big cities hospitalisation is relatively a new concept in India, and even in big city hospitals there is a marked tendency to regard the sick as nuisance to be got rid of as quickly as possible. The spirit of service is a moral attribute of slow growth, and has not developed in India to anything like the same extent as it has in countries where voluntary hospitals, built and maintained by charitably minded people, are the main avenue of hospital treatment. It is therefore essential that the medical officers should bear in mind that compassionate care and encouragement of their patients often has a therapeutic value as great as the actual medical treatment, and should educate their subordinates in the necessity for treatment of the sick in a sympathetic and kindly fashion.

The second pre-requisite is that the hospitals provided shall be efficient and attractive. Tumble down, ill-lit and badly ventilated structures which pass as hospitals in many tea gardens are so repulsive that it is no wonder the labour refuses to enter them for treatment. At the same time in many gardens seen where the hospitals were well built, clean, and attractive, one was often assured that the difficulty was not to get the labour to go into hospitals, but to get them out again when once they were in.

About the advisability of treating tea garden sick in some form of hospital there can be no doubt. At present housing conditions are so primitive that to expect a sick person to recover unless he can get away from the place in which he ordinarily lives would be to expect a miracle when a whole family has to eat, sleep, and live, in one poorly constructed ill-ventilated *bush*, the additional presence of a sick person strains the limited accommodation to the utmost, and makes life for the whole family virtually impossible. The state of affairs when the sick person happens to be suffering from some infective condition may easily be imagined, and the high incidence of and mortality from infectious diseases on tea plantation is due in no small measure to this very fact.

For these reasons it is clear that the only rational way to treat the sick on tea plantation is to treat them in hospital and that the way to get the labourers to use the hospitals provided for them is to educate them up to the advantages of hospital treatment. Hospital treatment is necessary from the humanitarian point of view and is beyond dispute the most economical form of medical care in the long run.

If the foregoing argument is accepted the bed provision suggested by the Indian Tea Planters' Association Jalpaiguri, is insufficient. Part of the case for reduction of the bed population ratio is based on certain recommendations of the Bhore Committee. The Association in their memorandum point out that under the Bhore Committee Scheme the ratio of hospital beds to population at the end of ten years will be 1.03 per thousand. It must be remembered that the Bhore Committee were faced with the most formidable task of suggesting a scheme by which medical care for India's teeming millions might be brought up to a reasonable standard. The leeway to be made up is so tremendous, and the difficulties of making radical changes in a poverty stricken country so marked, that it will take much longer than 10 years before Indian standards of hospital care can be anything like satisfactory. The Bhore Committee in its report makes no claim that the hospital state of country at the end of 10 years may be regarded as satisfactory, even if all goes well with their scheme. In fact the paragraph immediately following the one quoted by the Association says, "As has already been pointed out existing provision in England and Wales is 7.14 per thousand of the population, and in the United States is 10.48 per thousand." In this connection the following statement by the International Labour Organisation is relevant.

"The ratio of 5 hospital beds to every thousand inhabitants which was normally the general rule, and which was increased to 6 or 8 in cities, in industrial centres where there was a greater risk of accidents, and in ports has now risen to twelve, fourteen, or more".

The proposed hospital provision of the Indian Tea Planters' Association Jalpaiguri, is grossly insufficient for the purpose for which it is intended

and it is a poor argument to fall back on the Bhore Committee recommendations, and to say that because the best the Bhore Committee can do for the whole of India is 1.03 beds per thousand, the medical care on tea plantation should be based on comparable figures.

The suggestion of the Indian Tea Planters' Association, Jalpaiguri that estates with more than 50 employees but less than 500 should have an unqualified doctor should find no support. If the intention is to reduce the cost of medical care for small gardens, surely the solution is for them to combine to employ a properly qualified medical man, and to supply a satisfactory standard of medical care. In the tea industry a fair number of "doctors" who are not registered are employed. Some of these have been trained at schools the diplomas of which are not eligible for registration. It may be that some of these men are reasonably efficient, in fact the odd few may be excellent. But if the employment of unqualified men is to be officially recognised there is no guarantee at all that the men employed will have any knowledge of medicine whatsoever. There are at present men employed in the tea industry as "doctors" whose only knowledge of medicine is what they picked up years ago when they worked under another "doctor" who himself might have been unqualified, and whose own knowledge must have been extremely sketchy to say the least. The tradition of the unqualified practitioner dies hard, although it would appear to be a simple matter of common sense that a subject as wide as medicine cannot be learned by casually picking up odds and ends of professional knowledge. It is feared that the professed admiration for unqualified "doctors" expressed on some tea plantations visited has its basis in one feature and one only, namely that the unqualified man, knowing that his chances of employment elsewhere are negligible, is willing to work for a fraction of the cost of a qualified man. He is cheaper and he has to suffice. In one specific instance the writer was assured by a European manager that his "doctor" although unqualified was one of the cleverest doctors in Bengal. A little later the conversation came round to some longstanding abdominal trouble to which the manager in question was a victim, and it turned out that he was visiting the Civil Surgeon at frequent and regular intervals for treatment, and in addition was making regular trips as far as Calcutta for the same purpose. In other words his garden doctor was a very clever doctor indeed.....but not for him.

To sum up, it is felt that the case for reduction of the standards of medical care put forward by the Indian Tea Planters' Association, Jalpaiguri is based on fallacious premises. The standards of medical care suggested in this report have been very carefully calculated to provide the minimum which is necessary, and at the least possible cost commensurate with efficiency. The writer is convinced that in actual practice the cost involved would really be nothing at all, and in most cases would constitute a saving in hard cash over the present expenditure, since it would be repaid many times over by the improved health of the working population.

Lost man-hours arising from sickness represent one of the most costly items in the balance sheet of any industry, and any service which reduces lost man-hours is an all-important cog in the wheel of industrial progress.

## CHAPTER VIII

## IMPLEMENTATION OF THE PRESENT RECOMMENDATIONS—LEGAL ENFORCEMENT—APPOINTMENT OF MEDICAL INSPECTORS.

In considering the possibility of full implementation of the present recommendations, it is necessary to recall the events leading up to the final conclusions.

At the Tea Plantation Conference, the view was expressed by the employers that the Government of India should prescribe standards of medical services on tea plantations and enforce them, the actual provision of such services being left to employers. Large gardens would run their own services, whereas small gardens would combine and share the expense.

It is therefore for consideration whether under the existing constitution of the tea industry, the present recommendations can be implemented.

It is probable that the most important of the recommendations, that is the setting up of a comprehensive system of garden hospitals, can be implemented without undue difficulty within the present structure of the industry. The main difficulty in this connection will be in the case of small independent gardens with a population of say 500 or less. If the medical services of these gardens are to be efficiently run it means that even small gardens will have to employ their own medical officer, and build their own hospital, or that such gardens will have to combine, employ one or more doctors jointly, and build a combined garden hospital. The latter course would certainly be preferable and taking the long view would be much more economical.

If the present situation is to be taken as any criterion, however, there will be difficulties in the way of this. During the tour many instances occurred where it was clear that any sort of co-operation between different companies in the way of health organisation was very difficult to achieve. One instance has already been cited in Chapter III, where under one medical officer the standards of medical care on gardens owned by two different companies varied to an almost unbelievable extent, owing presumably to differences of outlook on a long term medical policy between the managers and owners of the two companies concerned. This example is likely to be multiplied many times in any large scale re-organisation of the medical services of the tea industry.

In any amalgamation of tea companies to provide a common medical service the basis of apportionment of cost would involve many difficulties, and opportunities for disagreement would be legion. Should the apportionment of cost be on a basis of total population? Should it be on a basis of acreage? Should it be on a basis of working population? Should it be on a basis of profits? Any of these methods of apportionment of costs is possible, and each method has its own advantages and its own drawbacks. In order to achieve any combination this is only one matter which would have to be decided, and there is no reason to think that many of the smaller companies, who as a rule work on a lower margin of profit than the big companies, and are much more chary of spending large sums of money on health and other social services, would easily come to an agreement on these preliminary steps.

It has been suggested that the Indian Tea Association which is by far the largest of the Employers' Associations would be able to induce its members to combine to formulate a comprehensive scheme. This may be possible, but



on the other hand one must face the fact that the Indian Tea Association, powerful though it undoubtedly is, is only an advisory body, and has no power to compel its members to adopt any given course of action. There would remain the companies who are not members of the Indian Tea Association. Many of these are members of other Employers' Associations, but the arguments which apply to the Indian Tea Association also apply to the other Associations, and perhaps with even greater force.

Whilst a great part of the programme with regard to the provision of garden hospitals could therefore undoubtedly be carried out by individual companies, and on individual gardens, there would remain some gardens for whom the implementation of the standards would present a problem. These however, would be relatively small in number and importance and it may be assumed that the institution of a comprehensive and efficient system of garden hospitals could be carried out without undue difficulty under the present organisation of the tea industry.

The higher we go up the scale of medical care the more difficult becomes the problem under the present constitution of the industry. The establishment of group hospitals would be a simple matter in connection with the largest companies. In fact some of them already have an organisation of a combined garden hospitals similar in many respects, to what has been recommended. In the case of smaller companies, however, co-operation and liaison between a large number of different companies would be necessary. In the specific case already mentioned two companies were concerned, but for the institution of group hospitals as many as a dozen or more might have to combine. The difficulties in the way of this, bearing in mind the points already mentioned, are obvious. This does not mean to say that the institution of group hospitals under the present organisation of the tea industry is impossible. That would be going too far. But it is not going to be easy. It is difficult to envisage how the problem could best be approached. It would appear that the matter of large scale planning of group hospitals would have to be undertaken by some central body. The only body connected with the tea industry which would have sufficient weight to embark on such a scheme would be the Indian Tea Association. This envisages that the Indian Tea Association should appoint at some early date one or more Administrative medical officers, with intimate knowledge of the present medical services, and of the terrain, to survey and draw up detailed plans for the siting and establishment of group hospitals, and the co-ordination of small gardens for the purpose of establishing joint garden hospitals.

The question arises as to whether it would not be preferable to establish some kind of central fund, to be drawn from the industry as a whole, and to be controlled by a central committee on which all interested parties would be represented, to provide for a comprehensive and planned system of medical care on all tea plantations.

The suggestion has already been discussed at the Tea Plantation Conference, and was withdrawn in favour of the employers' suggestion that the Central Government should prescribe standards, their implementation being left to the employers.

Apart from this it is true that taking the tea industry as a whole there is already in existence a scheme of medical care, which whilst it is badly organised and inefficient in some respects, does at any rate provide a nucleus which is capable of much improvement without entirely disrupting it.

In view of the present shortage of building materials, the marked lack of qualified medical practitioners, compounders, nurses, midwives and health workers, the present is not a good time to embark on large scale disruption of existing services, provided they function or can be made to function with reasonable efficiency.

It is therefore considered that for the present the best practical result are likely to be achieved by following the lines suggested by the employers at the Tea Plantations Conference.

*The general policy.*—It remains to be decided what steps should be taken to implement the general policy.

The policy as a whole should be divided into two fairly clearly defined stages.

*The first stage.*—For reasons which have already been given the first stage should be the bringing up of all garden hospitals to a prescribed standard. It was provisionally agreed by the employers at a meeting held in Calcutta on the 21st March, 1947, that excluding incalculable delays, shortage of essential materials, etc., this should be capable of achievement within three years. It is suggested that legislation giving powers of enforcement of this stage should be obtained fairly soon.

*Shortage of essential materials.*—In passing it may be mentioned that the Chairman of the Indian Tea Association, at the meeting in Calcutta stated that the allotment of steel to the tea industry for 1947 had been reduced from 850 tons to 150 tons as compared with 1946. If this reduction in allocation of steel, which is essential for any schemes for the betterment of labour conditions on tea estates, is to continue, it is of course obvious that no large scale health programme will be possible, and to introduce compulsive legislation would be a mere farce.

*The second stage.*—The second stage should be to plan and set up a comprehensive system of group or regional hospitals in close liaison with the Provincial medical authorities. The immediate urgency of this stage is less than that of the setting up of efficient garden hospitals, but it should not be shelved. As has already been indicated, the setting up of group hospitals for the tea industry should not proceed in complete isolation from the development of Provincial hospitals, but should be done in the closest possible liaison with the Provincial medical authorities in order to ensure that the whole working population of the Province, including tea labour, is adequately covered for hospitals of this nature. In areas where the working population is almost entirely "tea" the greater share of the responsibility for providing hospitals of the group type would naturally fall on the tea industry. In other places, where tea labour is a smaller part of the working population as a whole, Provincial hospitals of the group or regional type should be established by the Provincial Government, with financial aid from the tea industry, and a clear understanding should be reached before hand that suitable cases from tea estates are to be admitted without question.

If planned liaison of this kind is embarked upon without delay there is no reason why the whole working population in tea growing areas should not be covered for hospital provision of this type within a period of five to seven years, and co-ordinated planning should proceed without delay with this object in view.

## INSPECTION BY GOVERNMENT MEDICAL INSPECTORS

It is probably safe to assume that the tea industry as a whole will make every effort to implement the present recommendations for the improvement of medical care on tea plantations so far as garden hospitals are concerned, and will endeavour to meet the standards prescribed.

At the same time there will probably be individual owners who will either evade their responsibilities, or by adopting a policy of *laissez-faire* will neglect to bring their standards up to those required. This will probably be the case whether compulsive legislation is passed or not.

For this reason it is recommended that medical inspectors should be added to the cadre of the Provincial Governments, as soon as the precise policy is finally decided. Their function would be dual. Firstly they should act in an advisory capacity in the reorganisation of the tea industry medical services in general, and the provision of satisfactory garden hospitals in particular. Secondly, if powers of enforcement are obtained, they should act as inspectors to ensure that the standards of medical care prescribed are actually being provided, and to institute legal action where infringement of those standards is discovered. A large staff would not be necessary for this purpose, and it is considered that one medical inspector for the Assam Valley, one for the Surma Valley, one for North Bengal, and one for South India, would meet the case in the initial stages. The same medical inspectors could also be responsible for the inspection and control of record keeping and certification of maternity benefit claims as described in Chapter IX.

## CHAPTER IX

## MATERNITY BENEFIT AND CERTIFICATION

*Present maternity benefit.*—At the Tea Plantation Conference it was agreed that maternity benefit should be paid at the rate of Rs. 5/4/0 a week for 8 weeks, and the Employers' Associations agreed to recommend their members to give effect to this proposal pending legislation. During the tour it was apparent that most of the gardens had actually put the recommendation into operation, in fact some gardens were giving maternity benefit for a longer period than provided for in the recommendation.

The almost universal opinion of medical officers practising in 'tea' is that maternity benefit paid in this fashion is not in the best interest of the mothers. Their objection is not so much to the total sum to be paid in benefit, but to the short period for which benefit is payable. On tea plantations it is only very rarely that a woman is fit for work on the garden within 8 weeks of her confinement, and when her maternity benefit ceases, she is compelled to go to work in order to draw her rations. The doctors consider that in view of the usual physical condition of women after confinement on tea gardens, they are not fit for work in less than 12 weeks from the date of confinement, and that they should be excused work and entitled to draw maternity benefit for at least that period.

*Views of Medical officers.*—Greatest support was for maternity benefit for the following period and on the following scale.

Rs. 3 a week before confinement for 4 weeks. If the whole is not drawn during the 4 weeks preceding confinement, the outstanding balance to be paid at confinement.

Thereafter a cash payment of Rs. 3 a week for 12 weeks after confinement.

The total amount would thus be a little more than is usually paid at present (Rs. 48 as against Rs. 42) but in the opinion of practically every doctor interviewed this method and scale of payment would be very much preferable and would in the long run be an economy.

*Certification by tea garden doctors.*—In connection with the payment of maternity benefit, a question has arisen as to whether certification of the facts of pregnancy and confinement by tea garden doctors under the present constitution of the tea garden medical services would be likely to be reliable.

The whole of the tea industry is even now fairly well covered by the present scheme of medical care so far as staffing by registered medical practitioners is concerned. At the same time there are still gardens where no registered practitioner is employed. Where registered doctors were employed one was struck by the fact that on the whole they appeared to be of excellent type, keen on their work, and anxious for the improvement of the health services. Exceptions to this rule were very rare indeed. So far as the medical personnel is concerned it is therefore considered that there would be no danger in assigning to them the duty of certifying the facts of pregnancy and confinement.

Difficulty would arise where there is no registered practitioner employed. If the present recommendations are adopted, there will be no garden which would not be covered by a registered medical practitioner, and it is considered that when the recommendations are implemented so far as the establishment

of a comprehensive system of garden hospitals is concerned, there should be no difficulty at all in instituting a system of regular certification of the facts of pregnancy and confinement by the garden doctors.

If it were proposed to pay maternity benefit out of some central fund certain precautions would be necessary namely :—

- (i) A specified form of weekly certificate, as shown below should be compulsory.
- (ii) The general principle of no certificate without examination should be strictly adhered to.
- (iii) A separate pre-natal, natal and post-natal record card for each woman showing details of each certificate issued, with dates, should be maintained by the doctor concerned. A suitable blank card is shown in Appendix VIII.
- (iv) A system of inspection by centrally appointed medical inspectors, to ensure that the rules of recording and certification were being adhered to, should be instituted. These duties could be carried out by the same Medical Inspectors as are described in Chapter VIII, in addition to their normal duties of inspecting the tea garden medical services as a whole.

MATERNITY CERTIFICATE.

*Confidential.*

*To be filled in by the Doctor.*

To ..... No, .....

I hereby certify that I have examined you on the undermentioned date, and that in my opinion,

(a) on that date you were pregnant, the period of pregnancy being at least 34 weeks. The probable date of your confinement is .....

(b) you were confined, as I am informed, on.....

Medical Officer's signature .....

Date of examination and signing.....

## CHAPTER X

SOME OBSERVATIONS ON CERTAIN MATTERS AFFECTING THE HEALTH OF  
LABOUR ON TEA PLANTATIONS.

Although strictly speaking not within the terms of reference, a few important matters relating to the health of labour on tea plantations were forced upon our attention during the tour particularly certain matters connected with the welfare of non-working children the housing of the labour and supplies of water for washing and drinking. It is not proposed to discuss these matters in detail, but merely to draw attention to one or two points which seem to have escaped observation previously.

*The welfare of non-working children.*—One of the greatest difficulties in any attempt to improve health and social conditions in tea plantations is the ignorance of the labourers, and it might be appropriate to indicate one direction in which it is felt great improvement could be effected, namely by approaching the problem through the children.

Daily feeding of non-working children is now almost universal in the tea industry. The general opinion among medical officers is that this has already resulted in a much better standard of nutrition among children, and consequent improvement in their health. It is difficult to produce definite evidence in support of this contention, but in this regard especially it is felt that the opinion of the medical officers must be accepted.

At present the general rule is that children are fed in the hospital compound, although there are several notable exceptions. A common sight was to see a horde of children hanging round the verandahs of the wards or the main garden hospital building, waiting for their meal, mixed up with relatives of in-patients, out-patients waiting for treatment, open to all kinds of infection, and subject to no manner of discipline. This state of affairs is very bad for both the patients and the children not to mention the hospital staff, and could be altered with very little effort or expense. The feeding of children in hospital buildings should cease. Instead a children's block should be provided with proper water supply, bathing and washing arrangements, and really good water flushed latrines. In this block should be a children's dining room with a large playground attached, and infant's crèche and a child welfare centre. The building need not be elaborate, provided there is an impermeable washable floor. It would probably be better with half walls leaving plenty of ventilation and light. Its situation will of course depend on several factors, such as the availability of a suitable site. It could very well be placed immediately adjacent to the hospital compound proper, when it could come under the general supervision of the doctor and nursing staff and could be included in the administrative arrangements of the hospital so far as food storage and cooking are concerned. Having this in mind the block has been included in the diagrammatic sketch plan of a garden hospital shown at Appendix V.

The children's block should be in charge of some person capable of teaching them the elementary principles of health and cleanliness. The right person for the job might not be easy to find, but in some of the better gardens, where this principle has already been adopted in skeleton fashion, a suitable person has been found from among the garden pensioners, who with a very little training has filed the bill very successfully.



**Figure 3.** Housing conditions. In the foreground an old type basha. In the middle distance a new house similar in construction to the old one, but larger. In the background the frame-work of a new house.





The institution of a scheme of this nature would have two advantages. Firstly it would enable non-working children to be looked after during a considerable portion of the day while their parents were working on the garden, instead of running wild as they do at present, or taking up the time and attention of labour which should be at work on the garden. Secondly it would provide an avenue by which the present abysmal ignorance of the labour in matters of elementary health and hygiene could gradually be overcome. It is felt that health propaganda among adults is an almost impossible task. The only profitable course is probably to teach the children while they are at an impressionable age, and capable of profiting by instruction. By this means steady improvement in the sanitary habits of the labour could probably be achieved, the end results of which would be improved health of the community as whole, and a considerable reduction in sickness absenteeism.

*Housing.*—The housing of labour in tea plantations is at present very defective, but the whole matter has been very completely dealt with in the Labour Investigation Committee Report on the Tea Industry by Mr. D. V. Rega, and was fully discussed at the Tea Plantation Conference, when certain proposals for the improvement of housing conditions were adopted. During the tour it was clear that the intention to improve housing was in the forefront of the minds of the tea planters, but that their good intentions were being nullified by the virtual impossibility of getting supplies of steel and concrete to carry out their programmes.

There is one aspect of the question, however, which appears to have escaped notice.

During the tour one garden in the Assam Valley was inspected on which the owners, shortly before the war, had erected at considerable expense what were then the most modern and up-to-date labour lines. Each family had a well designed and constructed permanent dwelling, standing in its own compound, properly fenced off and with sufficient land to permit of the growing of enough vegetables to supply the family needs. At the end of each compound was a bore-hole latrine protected and made completely private by sheet iron walls with a sheet iron roof. It is understood that at the time of their erection nine years ago these lines were the pride of the company concerned, and regarded as a model for future developments.

The lines were carefully inspected during the tour. Here and there was a house which was admirably cared for. The fence had been maintained, the garden was cultivated, poultry was being kept, and the bore-hole latrine was functioning and was clean and well looked after.

The vast majority of the houses, however, were in a most neglected and dilapidated state. It was clear that long ago, perhaps soon after taking possession, the occupants had torn down the iron sheeting from around the bore-hole latrine and used the iron to make additions to the dwelling itself. The fence had been allowed to rot away and had not been replaced, no attempt at all was being made to cultivate the compound, and the whole place was neglected, dilapidated, dirty and insanitary. The bore-hole latrine, now open to the sky, was not being used except as a receptacle for odds and ends of rubbish.

The same medical officer was in charge as had been in charge at the time of the erection of the houses, and since the general standard of medical care and

health on the estate was very high indeed, the observations of the medical officer on the unfortunate state of the lines were sought with no little interest.

The conversation was some thing as follows :—

*Medical Officer.*—“These lines as you can see were once models of their sort. Very soon after their erection, however, the occupants began to pull down the iron sheeting from around the bore-hole latrines, and use them to make additions to the houses. In most cases the latrines were never used for their proper purpose from the start. Very few of the labourers made more than half-hearted efforts to cultivate their compounds. We tried to persuade the labourers to mend their ways but with very little success, and matters gradually went from bad to worse until the lines have reached the state you now see”.

*Major Lloyd Jones.*—“What was the method of settling the labour in the new quarters ?”

“We took one hole block of the old quarters and moved the people, and then destroyed the old quarters”.

“Did you make any attempt to select the occupants of the old quarters, or to supervise or advise them in any way when they were once installed in their new houses ?”

“No. No provision for disciplinary action or punishment of offenders existed, and so we never did any thing about that”.

The moral is clear. It is not much use erecting expensive new and sanitary quarters if the labour is just going to be dumped into them and the whole affairs left to look after itself.

This aspect of the problem of re-housing of the working classes is by no means peculiar to India. It is one with which administrators of schemes for the re-housing of the working classes have been met all over the world. It was one of the main bugbears of housing experts in Great Britain during the early years of slum clearances following the 1914-18 war. Originally in Great Britain attempts were made to solve the problem by introducing highly trained and educated housing managers and health visitors. This was not successful. The persons appointed were not in sufficient sympathy with the new population, and were met with sullen refusals even to admit them to the houses of the occupants. A typical remark one was constantly meeting was “Who is this new Health Visitor who comes to advise me about my kids. . . . . Me that’s buried seven”.

Eventually the problem was solved in many places by recruiting district nurses and health visitors who had practised in the slum areas and appointing them as housing advisors and health visitors in the new housing estates, to help and advise the occupants in becoming accustomed to the new conditions. These health visitors were thoroughly at home with the people they were going to advise, and having lived and worked among them for many years were familiar with their little peculiarities, with their special problems and perhaps most important of all had their complete confidence. From that time destructiveness and neglect in the new homes ceased and one hardly ever came across cases, which were frequent before, of occupants who kept their coal in the porcelain bath and allowed the garden to become a mass of weeds. At the present day large working class housing estates in Great Britain will bear comparison with the best of suburban areas.

Something of this nature will have to be carried out in Indian schemes for re-housing of labour. It is no use just putting the labourers into new and sanitary dwellings and piously hoping for the best. They must be helped, encouraged, and educated up to the new standards. For this purpose on tea plantations it would probably be wise to make some attempt to place families into new quarters on a selective basis. The labour population is by no means uniform in its general standards of intelligence and education, and there seems no good reason why when new dwellings are erected, the best of the labour should not be selected to occupy them.

One or more persons, selected from the most intelligent of the population on the garden, should be trained in the elementary principles of health and cleanliness, paid a good wage, and put in charge of the new lines with instructions to see that the new houses are well cared for and that the sanitary and other conveniences provided are properly used.

If this is combined with training of children on the lines indicated earlier nothing but good can result.

It was suggested by some planters and medical officers that legislation is necessary to provide for punishment of members of the labour force who do not obey the elementary rules of communal health. This is certainly not necessary. Under the present constitution of the tea industry the tea estate manager is in a position of great power so far as disciplinary measures are concerned. There is no reason whatsoever why part of this power should not be turned to good account in the way of measures for the improvement of the health of the garden community as a whole.

*Water supply.*—In most tea areas a reasonable supply of pure water is available. On the other hand highly polluted and dangerous sources of supply are still very common. Many estates still draw their supplies from surface wells and from rivers, both of which are liable to dangerous pollution. That this pollution actually does occur is evidenced by the high incidence of water borne infectious disease, and this is especially true of Darjeeling, where the incidence of such diseases is particularly high among children, and is the cause of high mortality, which in turn is the cause of great concern to the Darjeeling Planters' Association.

There is a general tendency to regard the problem of water supply in tea estates to be one of piping the supply. Distillation by piping is of course an enormous advantage, and to some extent a safeguard, but unless the original source of supply can be guaranteed to be free from contamination the piping of the supply is liable to be an actual danger, in that it gives a sense of security which is spurious.

There are many difficulties in the way of procuring a pure uncontaminated water supply when it is done piece meal by individual estates, which is the general rule at present. In the Assam Valley, for example, tube wells are fairly common, but the high percentage of iron in the water in many areas is a source of trouble. In North Bengal, on the other hand, where a great deal of the water is derived from the adjacent hills, the presence of mica in the water is a serious problem.

To the present writer, accustomed in England to the organisation of supplies of pure water from large storage reservoirs, supplied to the consumer by merely turning a tap, the primitive arrangements for the supply of this necessity of life in India are astounding. It seems particularly incongruous that in most tea growing areas, where there is an annual rainfall of anything from one hundred inches to several hundred inches of each year,

There should be any difficulty in laying on a plentiful supply of pure water. There is no real shortage of water, in fact the very opposite is the case. In the rainy season there is too much water, which washes away bridges, destroys tea bushes, and floods large areas of low lying land. The reason for failure is not that there is insufficient water, but that the machinery for collecting and distributing it is rudimentary. The breakdown is due to economic rather than natural causes and is only a part of the enormous economic waste which is evident in Indian industry on every hand. So far as the tea industry is concerned we are faced with the position that there are hundreds, may be thousands of tea estates, each going its own way in competition with its neighbours, each with its own puny attempts to obtain a supply of pure water. In fact it would probably be true to say that until there is some form of combination of effort, either through Government policy, or through rationalisation of the tea industry as a whole, the problem of a universal supply of pure and uncontaminated water to the tea estates of India is impossible of solution.

*Distribution of water.*—In the Labour Investigation Committee Report on Tea Plantations in Assam (page 58) Mr. Rege states that "water supply is generally adequate in all lines" and later, "a water supply usually exists within about 200 yards of a house". These statements are substantially correct as far as they go, but are open to considerable misapprehension. The mere fact that there is a water supply within 200 yards of a house may mean very little. On tea plantations the labour lives, generally speaking, in fairly condensed units of lines, and in an area of about 125,000 square yards, which might well sustain a total population of 1,000 or more, it would be quite possible for no house to be more than 200 yards from a single water point. In providing piped water supplies, therefore, attention should be directed to the number of persons per water point, rather than the distance of the water point from the houses supplied.

This point actually arose in connection with discussion with medical officers on the question of the prevalence of 'Naga sore' in many gardens. One medical officer said that he thought the lack of personal cleanliness of the labourers was an important factor in the production of these sores. His main contention was "These people seldom wash themselves, what can you expect?"

On this particular garden there was a piped supply of pure water, with a huge overhead tank. There was no shortage of water at any period of the year. The water was laid on to a group of lines, and there was a stand pipe with tap and an excellent concrete base so that the area round the tap was always clean and dry. In other words on superficial examination the water supply would have been deemed entirely satisfactory.

But on enquiry as to the number of persons living in the adjacent lines one was told that they numbered about 500. Since the labour has to report for work at regular fixed hours, the result was that there was a mad rush to draw water from this the only source of supply, at certain times of the day. It is very probable that the water was often drawn in unnecessary quantities and was later thrown away or otherwise wasted. One can hardly expect a high standard of personal cleanliness when 500 people have to rely on one water point.

It is therefore strongly recommended that in the laying down of a piped water supply, more attention be paid to the provision of an adequate number of water points, and that these be carefully sited so as to be in the most convenient situation for the persons who have to use them.

## CHAPTER XI

## SUMMARY AND CONCLUSION

The state of health of the labour, and the present organisation of medical care on tea plantations have been described following a survey by Major E. Lloyd Jones, I.M.S. (E.C).

Suggestions for standards of medical care to be prescribed by the Government of India have been made, and the possibility of their full implementation under the existing constitution of the tea industry discussed.

An estimate of the probable cost of medical care, if the recommendations made in the report are adopted, has been attempted.

Machinery for the enforcement of the standards, if suitable legislation is passed, has been suggested.

Certain conditions affecting the health of the tea garden population, which were observed during the tour, have been briefly described, with suggestions for improvement. The betterment of the health of tea plantation labourers and their families in India is dependent on many factors, of which an improved medical service is only one. So far as many tea growing areas in India are concerned, undernourishment, inadequate supply and distribution of water both for drinking and for washing, and sanitary arrangements of the most primitive type, combined with the ignorance of the workers in the most elementary principles of health and cleanliness, do more harm to the health of garden labour than could ever be overtaken by the most efficient medical service.

In conclusion Major Lloyd Jones wishes to place on record his deep appreciation of the assistance afforded to him during his tour by the various Employers' Associations, the Assam and North Bengal Branch of the British Medical Association, and by Superintendents, Managers and Medical Officers of tea estates everywhere, who combined to give every possible assistance in the investigations which had to be made. He also wishes to acknowledge the help of Mr. Basheshar Nath, B. A., Incharge Social Insurance Section, Office of Director General of Health Services, who accompanied him during the whole of the tour, and without whose most efficient staff work it would have been quite impossible to have achieved such a comprehensive survey of medical services in the tea industry in the limited time available.

## APPENDIX I

## DRAFT PROPOSALS AS PROVISIONALLY APPROVED BY REPRESENTATIVES OF THE PROVINCIAL GOVERNMENTS AND THE EMPLOYERS' ASSOCIATIONS

The following summarised draft recommendations were submitted by Major Lloyd Jones to meetings of representatives of Provincial Governments, and the Employers' Associations, and were provisionally approved.

After his return to Delhi, with an opportunity for more careful and detailed examination of the data collected, Major Lloyd Jones considered that some slight modifications in the figures were necessary, although the general principles involved remained the same. From informal enquiry it is understood that the main Employers' Associations have no objection to the proposed minor amendments. The final recommendations are therefore slightly different and are as stated in Chapter V of this report.

## STANDARDS OF MEDICAL CARE FOR TEA PLANTATION LABOUR IN ASSAM

At a meeting of the Tripartite Conference held at New Delhi in January last, it was agreed that standards of medical care for tea plantation labour should be prescribed by the Government of India in consultation with the Provincial Governments concerned, and the Tea Associations.

The Deputy Director General, Indian Medical Service (Social Insurance) Major E. Lloyd Jones, I.M.S., was later deputed to visit tea plantations in Assam and to formulate standards in consultation with the Provincial Government and the Tea Associations.

Following a meeting with the Chairman of the Indian Tea Association and other representatives of Tea Associations in Calcutta, Major Jones visited Shillong, and attended the Annual General Meeting of the Assam and North Bengal Branch of the British Medical Association, where the standards of medical care were very fully discussed. Discussion also took place with Mr. H. F. Clark, Labour Adviser to the Indian Tea Association.

Major Jones then proceeded on a rapid tour of tea plantations in Assam and visited over 80 gardens in the vicinity of the following places, inspecting dispensaries, hospitals, laboratories, medical stores, etc., and interviewing Circle Chairman, Superintendent, Managers and Medical Officer:—Selong Hat, Amgoorie, Panitola, Chabua, Jorhat Town, Mariani, Labae, Lungia and Juri Valley.

On his return from this tour, Major Jones attended an informal departmental meeting called by the Chief Secretary to the Government of Assam and attended by the Inspector General of Civil Hospitals, the Director of Public Health, the Assistant Labour Commissioner, the Secretary, Medical Department, and the Chief Secretary, Government of Assam, and by Mr. J. S. Hardman, Mr. H. F. Clark, and Dr. C. G. Terrell, where tentative proposals submitted by Major Jones were fully discussed, and many valuable suggestions and amendments made.

Major Jones also attended a meeting of the Commerce Group of the Assam Legislature, by kind invitation of the Chairman, where the question under consideration was further discussed.

The Hon. the Minister for Health was also interviewed.

Major Jones has also given careful consideration to the proposals put forward by Professor G. MacDonald of the Ross Institute, and by Mr. P. J. Griffiths.

As a result of his tour, and of these conferences,\*etc., Major Jones has arrived at the following provisional conclusions which will form the basis of his recommendations.

1. The main objective must be raise the level of medical care in back ward gardens to a level more closely approximating to the present standards in the better gardens. This involves the adoption of minimum standards.

2. The vast bulk of mortality and sickness incidence arises from conditions which do not require elaborate and expensive hospital treatment.

3. The worst features of all the gardens visited are the very high maternal mortality and the very high infantile death rates, although it is not suggested that these rates are higher on tea gardens than the rates for the Province as a whole.

4. The outstanding need is therefore for improvement at the garden end.

5. For this reason Regional Hospitals are not considered to be an urgent necessity. In this connection it is understood that the Government of Assam has approved plans for two large teaching hospitals to be provided in the very near future in Sylhet and Dibrugarh respectively. This renders the question of special 'tea' regional hospitals still less urgent.

6. *Group Hospitals.*—Some provision for the treatment of cases which require special treatment or investigation, at level which would not ordinarily be provided at a garden hospital is necessary, although nothing like as urgent a matter as the provision of a sound and universal system of garden hospitals. The aim should be to provide hospitals of this type to serve population groups of at least 30,000 to 35,000 on a basis of 3 beds to every thousand population served, that is the hospitals would ordinarily have at least 100 beds, which is the smallest size for hospitals of this type to function economically.

7. The question of the provision of Group Hospitals is very closely tied up with the proposals of the Government of Assam for provincialisation of certain Local Board Hospitals. It is understood that the Government of Assam propose very shortly to establish such hospitals at Silehar, Nowgong, Dhubri, Jorhat and Tezpur. These hospitals will have specialist staff, properly equipped surgical theatre blocks, and X-Ray Plants.

8. It is suggested that immediate liaison between the tea industry and the Government of Assam is necessary in order to avoid lack of co-ordination in the general scheme of hospital planning.

9. The provision of District Hospitals on the lines envisaged by the Government of Assam will go a long way towards solving the question of special Group Hospitals for the tea industry labour population.

10. At the same time there will be areas where Provincial District Hospitals will not adequately serve the population of the tea industry. In such areas early planning of the tea industry medical organisation should proceed, bearing in mind the necessity for tea industry Group Hospitals in such areas in mind.

11. In such areas the Group Hospitals should be equipped and staffed in such a way as to be capable of dealing with any ordinary medical, surgical, obstetric, or gynaecological emergency.

12. The Medical Superintendent of the Group Hospital should preferably be in administrative medical control of the whole population served by the hospital.

13. He should have a well qualified and experienced deputy to be mainly responsible for the supervision of standards of medical care on the gardens themselves.

14. There should be at least three additional hospital medical officers one of whom should be a woman.

15. The Group Hospital should act as a training school to supply nurses and midwives both for the Group Hospital and for the garden hospitals.

16. It is suggested that a nucleus of such Group Hospitals should be established as early as possible by the provision of a Central Laboratory and a Central Medical Store for the whole of the group of garden hospitals served by the Group Hospital. This nucleus could then be enlarged as opportunity afforded, and would of itself be a most valuable acquisition, quite apart from the addition of any actual hospital beds. The Central Medical Store would issue drugs, and especially standard stock mixtures, for the use of the garden hospital, and would certainly prove a much more efficient and economical method of drug supply than the one at present existing in the majority of gardens, where separate indents are prepared, and stock medicines dispensed for very small units. A Central Medical Store is the best safeguard against dishonesty in the disposal of medicines.

17. Even in areas where it is found that the needs of a group of gardens can best be served by arrangement with the Provincial District Hospital, the provision of a Central Laboratory and a Central Medical Store is strongly recommended.

18. *Garden Hospitals.*—These should be provided on a general scale of 12 beds to every thousand of population served. They should be of sound permanent construction, with impervious washable floors, and impervious washable walls to a height of at least 5 feet, with proper water supply, efficient sanitary arrangements, and an out-patient department, preferably in a separate block in hospitals with 24 beds or more.

At least 2 of the 12 beds should be in a separate block for midwifery cases, with a properly equipped labour room, and facilities for infant and child welfare supervision. At least 4 of the remaining beds should be in a separate isolation block for infectious cases. The isolation block need not be at a great distance from the main hospital.

The garden hospital should be the centre of health activities on the garden.

19. Garden hospitals should be staffed with registered doctors in a general ratio of one doctor to every 1500 of population.

20. Each garden hospital should have on its staff at least one trained nursing attendant for every 12 beds, at least one trained dai or midwife for every thousand of population served, a qualified compounder, and an anti-malaria assistant. In the initial stages the qualifications of the nursing attendant and the midwife will probably have to be less than is really desirable, and locally trained attendants may have to suffice in some instances for the present, but the aim should be to have these replaced by trained and registered nurses and midwives as soon as such become available.



21. Small gardens or outgardens, so situated as not to be within reasonable distance or reach of a garden hospital, should have a dispensary with 3 or 4 detention beds, under the immediate care of a qualified compounder but supervised and visited regularly by the nearest garden hospital doctor.

22. The feeding of children should not be allowed in and around the hospital buildings as is at present almost universal practice. This is bad both for the children and for the hospital inmates. A separate building, with impermeable washable floor, but which otherwise need not be elaborate, should be provided. If necessary this and the hospital could be served by the same cook house for the sake of economy. The whole should be supervised by the garden doctor.

23. The children's feeding place should have a big play ground with proper water supply, bathing and washing arrangements, and proper latrines. The children should be in the care of some person capable of teaching them the elementary principles of cleanliness and sanitation. In this way it is considered that the present abysmal ignorance of the labour in these matters could gradually be improved by teaching the children when they are at an impressionable age, and capable of profiting by instruction.

24. It is considered that the whole plan for the betterment of medical care in tea plantations should in the main be regarded as of two stages. The first stage should be the provision of a complete and efficient system of garden hospitals on all gardens, to the standards mentioned in paras 18 to 21 above with statutory enforcement. It is considered that, excluding incalculable delays' shortage of essential materials etc. this should be capable of achievement within three years.

25. The question of the provision of Group Hospitals is not of the same immediate urgency as the provision of a complete system of garden hospitals but should not be allowed to lapse, and should be the subject of very early planning in close liaison with the Provincial Government.

26. Although strictly speaking not within his terms of reference, Major Jones is quite convinced that so far as some areas in Assam are concerned undernourishment, inadequate distribution of water, both for drinking and for washing, and poor sanitary arrangements combined with the ignorance of the labour in the elementary principles of health and cleanliness do more harm to the health of garden labour than could ever be overtaken by the most efficient medical service.

Finally he would like to place on record his deep appreciation of the invaluable assistance of Mr. Clark, Labour Adviser to the Indian Tea Association, who kindly arranged the bulk of the itinerary of his tour, and helped in countless ways, and express his thanks to the President, Honorary Secretary, and Members of the Assam and North Bengal Branch of the British Medical Association and to Circle Chairman, Superintendents, Managers and Medical Officers, every where, who combined to afford every possible assistance in the investigations which had to be made and to convert what might well have been an unenviable task, into one which was a constant source of intellectual profit and pleasure.

#### STANDARDS OF MEDICAL CARE FOR TEA PLANTATION IN BENGAL

At a meeting of the Tripartite Conference held in New Delhi in January last, it was agreed that standards of medical care for tea plantation labour

should be prescribed by the Government of India in consultation with the Provincial Governments concerned and the Tea Associations.

The Deputy Director General, Indian Medical Service (S. I.) Major E. Llyod Jones, I. M. S. was later deputed to visit tea plantations and to formulate standards in consultation with the Provincial Governments and the Tea Associations.

Major Jones has already completed a tour of Tea Plantation in Assam and has ascertained the views of the Government of Assam, and the Indian Tea Association and the Indian Tea Planters Association with regard to standards of medical care in Assam.

The Provisional recommendations of Major Jones regarding standards of medical care for tea plantations in Assam have been agreed to by the parties concerned.

In order to inspect the existing medical facilities in Tea gardens in Bengal Major Jones commenced a tour from Jalpaiguri on the 28th April, 1947, following a meeting with the Indian Tea Planters Association Committee at Jalpaiguri. Up to date about 60 gardens in Dooars and Terai have been surveyed.

Major Jones has also given careful consideration to proposals put forward by Mr. B. C. Ghose of Jalpaiguri and Mr. H. E. A. Ray of Darjeeling Planters' Association.

As a result of his tour and meetings with representatives of the interested parties Major Jones has arrived at the following provisional conclusions which will form the basis of his recommendations to the Government of India.

Conditions in Bengal Tea Plantations are rather different from those prevailing in Assam tea gardens. The general health and nutrition of labour is considerably better than in Assam although the all round standard of medical care is about the same. The better health is possibly due to the fact that the labour in Bengal is on a better diet. The men are great shikaris, and wild pig and jungle murgis, etc., are fairly frequent addition to their diet, supplying a fair quantity of first class protein. They also grow more vegetables in their spare time and many of them keep goats and chickens. Statistics have been collected but have not yet been correlated. It is however, certain that they will bear out the result of personal observation.

1. The main objective must be to raise the level of medical care in backward gardens to a level more closely approximating to the present standards in the better gardens. This involves the adoption of minimum standards.

2. The vast bulk of mortality and sickness incidence arises from conditions which do not require elaborate expensive hospital treatment.

3. The worst features of all the gardens visited in Bengal are the very high maternal mortality, and the very high infantile death rates, although it is not suggested that these rates are higher in tea gardens than the rates for the Province as a whole.

4. The outstanding need is therefore for improvement at the garden end.

5. Regional Hospital are not considered to be an urgent necessity.

6. *Group Hospital*—Some provision for the treatment of cases which require special treatment or investigation, at a level which would not

ordinarily be provided at a garden hospital is necessary, although nothing like as urgent a matter as the provision of a sound and universal system of garden hospitals. The aim should be to provide hospitals of this type to serve population group of at least 30,000 to 35,000 on a basis of 3 beds to every thousand of population served, that is the hospital would ordinarily have at least 100 beds, which is a smallest size for hospitals of this type to function economically. Planning for group hospitals by the Employers' Associations should therefore proceed in close liaison with the Provincial Government with a view to their establishment as soon as garden hospitals to the prescribed standards have been universally provided.

7. The Group hospital should be equipped and staffed in such a way as to be capable of dealing with any ordinary medical, surgical, obstetric, or gynaecological emergency.

8. The medical superintendent of the group hospital should preferably be in administrative medical control of the whole population served by the hospital.

9. He should have a well qualified and experienced deputy to be mainly responsible for the supervision of standards of medical care on the garden themselves.

10. There should be at least three additional hospital medical officers, one of whom should be a woman.

11. The group hospital should act as a training school to supply nurses and midwives both for the Group Hospital and for the garden hospitals.

12. It is suggested that nucleus of such group hospitals should be established as early as possible by the provision of a Central Laboratory and a Central Medical Store for the whole of the group of garden hospitals served by the group hospital. This nucleus could then be enlarged as opportunity afforded, and would of itself be almost valuable acquisition, quite apart from the addition of any actual hospital beds. The Central Medical Store would issue drugs, and especially standard stock mixtures, for the use of the garden hospitals, and would certainly prove a much more efficient and economical method of drug supply than the one at present existing in the majority of gardens, where separate indents are prepared, and stock medicines dispensed, for very small units. A Central Medical Store is the best safeguard against dishonesty in the disposal of medicines.

13. Even in areas where it is not considered necessary to establish a group hospital for the use of tea population alone, the provision of a Central Laboratory and a Central Medical Store is strongly recommended.

14. *Garden Hospitals.*—These should be provided in Bengal on a general scale of 9 beds to every thousand of population served. They should be of sound permanent construction, with impermeable washable floors and impermeable washable walls to a height of at least 5 feet, with proper water supply, efficient sanitary arrangements, and an out-patient department preferably in a separate block in hospitals with 18 beds or more.

At least 2 of the 9 beds should be in a separate block for midwifery cases with a properly equipped labour room, and facilities for infant and child welfare supervision. At least 3 of the remaining beds should be in a separate isolation block for infectious cases. The isolation block need not be at a great distance from the main hospital.

The garden hospital should be the centre of health activities on the garden.

15. Garden hospitals should be staffed with registered doctors in a general ratio of the doctor to every 1750 of population (as against 1 to 1500 in Assam).

16. Each garden hospital should have on its staff at least one trained nursing attendant for every 9 beds, at least one trained midwife or dai for every thousand of population served, a qualified compounder, and an anti-malaria assistant. In the initial stages the qualifications of the nursing attendant and the midwife will probably have to be less than is really desirable, and locally trained attendants may have to suffice in some instances for the present, but the aim should be to have these replaced by trained and registered nurses and midwives as soon as such become available.

17. Small gardens or out-gardens with a population of 500 or less so situated as not to be within reasonable distance or reach of a garden hospital, should have a dispensary with 3 or 4 detention beds, under the immediate care of a qualified compounder but supervised and visited regularly by the nearest garden hospital doctor.

18. The feeding of children should not be allowed in and around the hospital buildings. This is bad both for the children and for the hospital inmates. A separate building with impermeable washable floor but which otherwise need not be elaborate should be provided. If necessary this and the hospital could be served by the same cook house for the sake of economy. The whole should be supervised by the garden doctor.

19. The children's feeding place should have a big play ground with proper water supply bathing and washing arrangements, and proper latrine. The children should be in the care of some person capable of teaching them the elementary principles of cleanliness and sanitation. In this way it is considered that the present abysmal ignorance of the labour in these matters could gradually be improved, by teaching the children when they are at an impressionable age, and capable of profiting by instruction.

20. It is considered that the whole plan for the betterment of medical care in tea plantations should in the main be regarded as of two stages. The first stage should be the provision of a complete and efficient system of garden hospitals on all gardens, to the standards mentioned in paras 14 to 18 above, with statutory enforcement. It is considered that, excluding in calculable delay, shortage of essential materials etc., this should be capable of achievement within three years.

21. The question of provision of group hospitals is not of the same immediate urgency as the provision of complete system of garden hospitals, but should not be allowed to lapse, and should be the subject of very early planning in close liaison with the Provincial Government.

Major Jones would like to place on record his appreciation of the assistance rendered by Mr. B. C. Ghose, and members of the Indian Tea Planters' Association, by Mr. C. L. Burton, Chairman of the Terai Indian Planters' Association and by Managers, Medical Officers everywhere who combined to give every possible assistance in the investigation which had to be made.

STANDARD OF MEDICAL CARE FOR TEA PLANTATION IN BENGAL  
DARJEELING DISTRICTS

Darjeeling excluding Siliguri and Kalimpong sub-division presents so many unique features that the problem of medical care on tea plantations in the area is different from the problem in any part of Assam or in Dooars.

The main reason for most of the differences is the different topographical nature of the country which is no doubt indirectly responsible for the relatively small size of the gardens.

It is understood from the Secretary of the Darjeeling Planters' Association Lt. Colonel E. S. E. Rerrie that the total acreage under tea in Darjeeling area is about 40,000 acres. The total working population at the end of 1946 was 58,579 and the total population 96,746. The area is therefore of much importance from the point of view of Labour Welfare, and its peculiar problems can by no means be ignored.

There are only 24 gardens with a population of over 1500, and the majority of gardens have a total population of 1000 or less.

Garden hospitals for individual gardens will therefore only be possible in small proportion of cases.

Owing to the nature of the country, spurs of high altitude divided by deep ravines, gardens which may only be separated by a few miles as the crow flies may be several hours journey apart in actual practice. For this reason any combination of small gardens to form a single unit for purposes of medical care is not going to be easy, and in the case of Darjeeling careful planning of the garden medical organisation, and of its staffing from the point of view of combination of effort, is an absolute necessity.

At the same time it is considered that there is no need to depart in principle from the standards suggested for the Dooars and the Terai. The all over standard should be the same, but the implementation of that standard is going to be more difficult in Darjeeling than in any other part of Assam or North Bengal. The standards suggested for the Dooars and the Terai which should also apply to Darjeeling are :—

- 9 Garden hospital beds to 1000 of population.
- 1 Registered doctor to 1750 of population.
- 1 Trained dai to 1000 of population.
- 1 Nursing attendant to 1000 of population.
- 1 Qualified compounder to 1750 of population.

In Darjeeling there are some gardens with a population of 500 or less, and for these gardens the remarks which have already been made in connection with such gardens in Assam, apply with equal force, namely that such gardens should combine with neighbouring gardens, but where they are so situated as not to be within easy reach of neighbouring gardens, they should have a dispensary with 3 or 4 detention beds, in charge of a qualified compounder and that the dispensary should be visited regularly by the nearest registered garden doctor.

It will be seen that in Darjeeling, where the proportion of small gardens is high, that this will require careful planning and co-operation between the gardens concerned and it is suggested that the best plan would be for one or more full time Administrative Medical Officer to be appointed by the Darjeeling

Planters' Association to formulate a comprehensive plan in the first instance, and later to be responsible for the smooth running of the medical organisation of the whole area covered by the Darjeeling Planters' Association.

The above remarks formed the basis of discussion at a meeting of the Committee of the Darjeeling Planters' Association held on the 10th May 1947 which was addressed by Major E. Lloyd Jones.

General agreement was expressed by the Committee with the remarks of Major Jones but three additional points were raised.

- (1) The difficulty of recruiting qualified doctors, compounders, dais and nurses in Darjeeling and especially the difficulty of getting the indigenous population trained.
- (2) The high incidence of tuberculosis in the area and the lack of adequate provision for its prevention and treatment by the Government.
- (3) Review of the Tea Industry Medical Service in the area must go hand in hand with review of the Government Civil Medical arrangements for population residing in such as Khas Mahal areas (bastees).

Major Jones undertook to draw the attention of the Government of Bengal and the Government of India to these matters.

## APPENDIX II

MEMORANDUM OF THE INDIAN TEA PLANTERS' ASSOCIATION, JALPAIGURI  
ON PROPOSED FIXATION OF MINIMUM STANDARD OF MEDICAL AIDS FOR  
THE TEA INDUSTRY

When the question of Medical aid that was being given at present to the labourers in the Tea Estates was discussed at the last Tripartite Labour Conference on Plantation labour in Delhi in early January, it was decided that in order to enable the Tea Estates to maintain the minimum standard, a standard should be prescribed by the Government which could be treated as the minimum to be maintained by the Estates. The precise resolution on the subject runs as under :—

5 (iii) "The general view was that Government should prescribe the standards and enforce them, the actual provision of Medical services being left to the employers. Large gardens would run their own services, while small gardens would combine and share the expenses".

(iv) "It was agreed that the employers should submit their proposal to Government through Provincial Governments and that the matter should be discussed again at the next conference".

It will be apparent therefore from 5 (iii) that the minimum standard to be prescribed will be enforced statutorily by the Government, possibly through the proposed Plantation Act. It will also be apparent from the above that the employers are required to submit their proposals to Government through Provincial Governments when the question would be discussed in the next conference. Accordingly therefore the opinion of the Association is given.

The Association had the opportunity of discussing the subject with major E. Lloyd Jones, M.D., I.M.S., Deputy Director General, Indian Medical Service (Social Insurance), who was good enough to explain his tentative scheme of minimum standards which he suggested for Assam.

The main object of enquiry which is being conducted by the Major is to suggest a minimum standard which must be maintained by a Tea garden and that statutorily no Tea Estate would be allowed to employ labour unless it maintained the minimum standard. Therefore, the minimum standard should be the irreducible minimum which must have some basis on present standards of Medical aid enjoyed elsewhere in the country with certain additions for the inability of the employer due to occupational hazards. In

The Bhoré Committee Report on "Health of Industrial Employment," the liability of the employer has been clearly defined :—

"The conditions effecting the health of a worker may, broadly speaking, be divided into 2 groups, viz., those which he shares with the other members of the general community among whom he lives and those which are associated with the occupation he pursues. In regard to the latter there may be special hazards to health arising out of particular occupations" (see page 71 Vol. I).

It will therefore be seen clearly that the Employers' liability for Medical aid is to that extent which would counteract special hazards to health arising out of the occupation of the labourers in a Tea Estate. Therefore, in any compulsory enactment of minimum standard only such provision should be accepted which would be required for this particular purpose. In the

opinion of the Association there is no particular hazard connected with the occupation of the labour in the Tea garden. The only hazard, if there be any at all may be in connection with Maternity as the women workers have to work in the open. If therefore any special provision has to be made for occupational hazards by the Tea Estates it should be in this direction and the Estates should have no liability for maintaining any other higher medical aid than what is enjoyed by the people in the country in the locality in which the Tea Estates are situated. Distinction must be made between "a desirable standard" and a statutorily fixed "minimum standard", as we are to face the latter we assert that the standard to be set should be such which must have some bearing to the conditions in the country. We now deal this question in 2 parts, Indoor and Outdoor :—

*Indoor.*—In the primary report submitted by the Major he has suggested the provision in each estate of the following beds :—

- (a) Three beds in a Group Hospital per 1000 population.
- (b) Twelve beds in Garden Hospitals per 1000 population.
- (c) Small gardens or out gardens should have a Dispensary with 3 or 4 detention beds.

In the opinion of the Committee these proposals are very much higher than what is actually necessary or what is expected to be achieved by the far reaching Long term proposals of the Bhore Scheme. In page 15 Vol. iv, the following figures are available :—

*Hospital Bed per 1000 population*

At present (In India)	0.24
Expected after 5 years	0.55
Expected after 10 years	1.03
Expected at the end of termination of the Long term Scheme	5.67

On the above basis, therefore, the suggested minimum standards for Tea Estates are definitely high. This Association therefore suggest the following:—

- (a) Estates not employing more than 500 labourers should have no liability of maintaining any Indoor bed. It should only be required to have a doctor with a dispensary for out-door services. The doctor may be an unqualified one but there should be provision for periodic visit by a qualified doctor.
- (b) Group Hospitals should be started for a population of about 40,000 in tea localities covering most of the Tea garden labourers. These Hospitals should become the preliminary units under the Bhore Scheme and should be Government liabilities. In order, however to have better facilities which the Tea Estates should be required to have for its labourers, Tea Industry should bear practically the major portion of cost of maintenance of such Group Hospitals. It is suggested that the basis should be 2 beds per 1000 population at a fixed charge of Rs. 1,000/- per bed per annum. The Estates should have the right to have these 2 reserve beds. The cost of construction of the hospitals should be the Government liability. The present Group Medical Officer of Tea Estates, (who have requisite qualifications and are all Bachelors of Medicine) should be attached as the Chief Medical Officer of these Group Hospitals or the Primary units.



*Note.*—At present what is generally done is that if any capital cost for erection of a building is provided by a donor the cost of main tenance is borne by the Government for starting and maintaining a dispensary. It will be found on examination that practically the capital spent on the building of the Hospitals is raised in 4 to 5 years time on the recurring expenditure. The proposals that we now are giving are calculated to revert this procedure and if the Government can bear the capital cost the recurring cost practically will be borne by the Tea Estates and hence the future liability for maintenance of these primary units of the Government will be practically nothing.

- (c) Estates employing more than 500 labourers should have the liability of maintaining three beds in the garden per every 1000 labourers one of which is to be set apart for gynaecological case.

*Note.*—Though in the report Major Lloyd Jones has used the words “population”, it is understood he means really working labour and on this basis the above proposals are being given.

*Out-door Services.*—It is the Indian custom to prefer to have medicines by bed side in one's own home at the time of sickness rather than to go to hospitals. This is common not only in one class of the society but almost in every class. We have found this on experience and therefore in the past we have concentrated more on giving out-door services than on in-door services. We think therefore that the following provision should be made:—

- (a) An Estate employing less than 50 labourers should have no liability to have a Dispensary.

*Note.*—A large number of such Estates could be found in the Kangra Valley, in Assam and in Nilgiris.

- (b) Estates having more than 50 but less than 500 labourers should have a Dispensary which may be in charge of an unqualified doctor with the provision of periodic visit by a registered doctor
- (c) For Estates employing more than 500 labourers 1 registered doctor should be provided for every 1000 population.

*Note.*—Those doctors who are actually in service should be allowed however to continue but no new recruitment of unqualified doctor is to be made.

- (d) Where there is more than one doctor in an Estate there may be one unqualified for every other qualified doctor.
- (e) There should be at least one trained Midwife per 2000 labourers.
- (f) There should be provision for having a separate Maternity clinic to be in charge of the garden doctor assisted by the midwife.

*Costs.*—The above proposals are likely to take the cost substantially ahead of the present service in many Estates and this cost is likely to vary between Rs. 6 to Rs. 10 depending upon the population and size of the Estate. This would compare very favourably with the present cost of Medical expenditure *per capita* per annum that can be found no where in the rural areas

outside the Tea Estates. The present cost in India and the cost to be incurred if Bhore Scheme is to be implemented are given as under :—

Expenditure on Medical Head *per capita* per annum :

Present Expenditure in Bengal (1944-45)	7.1 anna.
Present Expenditure in Assam (1944-45)	5.4 anna.
Proposed expenditure after 5 years Short-term Scheme	Rs. 1/4/-
Proposed expenditure in the 2nd 5 years	Rs. 2/7/-
Proposed average 1st 10 years	Rs. 1/14/-

Finally, the Association would like to assert that as it is question of fixing the "minimum" by statute it is not agreeable to the Government's fixing anything above the standards set out above. The association suggests that cost of medicine which an Estate should statutorily provide should not exceed Rs. 1-8 *percapita*.



**Figure 4.** A Maternity and Child Welfare Clinic conducted under difficulties. Note the inadequate hospital building, which has to serve for all purposes and the lack of any accommodation for patients to sit under cover.



## APPENDIX III

## VITAL STATISTICS OF SOME TEA ESTATES SURVEYED

<i>Assam</i>	The Assam Valley. The Surma Valley.
<i>Bengal</i>	The Dooars. The Terai Darjeeling.
<i>South India</i>	The Nilgiris. The Nilgiri-Wynaad. The Annamallais.

Many of the gardens visited keep very incomplete records, and some of the doctors are not familiar with the commonly accepted methods of maintaining vital statistics. For example it was not uncommon to be supplied with a figure stated to represent the infantile mortality rate on a garden for a given year. On further enquiry it would be revealed that the figure represented the number of infant deaths per thousand of population, instead of the number of infant deaths per thousand live births, which is the usually accepted definition of the infantile mortality rate. It is therefore clear that figures of vital statistics cannot be accepted as correct unless it has been confirmed that they have been prepared in accordance with commonly accepted practice.

The figures given below, which are for 1946, were confirmed by reference to the daily attendance sheets, and the births and deaths registers, and may be accepted as reasonably accurate. Even so there are errors. For example in many cases if a person from the garden dies in the nearest District Board, or other hospital, or in an adjacent village, the death is not included in the garden deaths register, although the person will have been included in the total population figures.

## ASSAM

*Assam Valley**17 European owned gardens*

Mortality rate per 1,000	Live birth rate per 1,000	Infantile mortality rate per 1,000 live births	Maternal mortality rate per 1,000 cases
21·9	28·8	189·1	38·3
34·9	31·6	373·3	58·3
25·2	23·9	216·2	50·0
27·0	38·1	106·0	35·3
13·6	24·4	125·5	18·4
18·9	34·2	193·4	58·4
24·7	32·1	156·1	54·2
24·6	34·0	127·2	27·5
20·2	36·4	148·1	17·2
24·8	31·2	202·5	24·8
22·4	28·4	231·0	22·8
19·8	22·6	166·5	34·1
17·9	21·5	189·0	40·1
21·8	28·3	206·2	32·4
26·1	32·8	297·0	46·3
21·9	34·7	158·4	22·1
14·7	31·2	147·3	18·2
<b>Total</b>	<b>380·4</b>	<b>3,196·8</b>	<b>598·4</b>
<b>Average</b>	<b>22·4</b>	<b>188·0</b>	<b>36·2</b>

	Mortality rate per 1,000	Live birth rate per 1,000	Infantile mortality rate per 1,000 live births	Maternal mortality rate per 1,000 cases
	19.2	40.1	189.3	32.2
	14.1	38.9	138.7	22.9
	18.1	29.9	126.2	21.0
	20.2	36.4	174.5	17.2
	24.7	41.6	178.4	19.9
	22.9	23.9	122.3	12.6
	19.2	38.2	112.0	28.8
	14.7	39.7	162.4	26.5
	15.1	29.9	159.3	23.1
	14.9	30.0	131.7	17.6
	14.7	21.9	128.5	18.9
	15.2	45.5	166.8	24.9
	18.2	28.9	152.2	23.1
	19.1	36.2	133.6	18.4
	18.6	44.1	132.5	17.7
	14.4	40.1	155.1	26.8
	19.9	37.6	171.0	28.9
	14.7	42.3	165.5	26.1
	15.3	36.9	133.9	22.0
	14.8	46.2	148.8	18.2
Total	348.8	728.3	2,992.7	446.8
	17.4	36.4	149.6	22.3

## BENGAL

## The Dooars

25 European, 11 Indian owned gardens  
(Indian gardens marked\*)

*15.0	20.0	127.7	22.0
32.5	35.2	175.0	33.1
36.6	44.8	330.0	18.2
*11.5	27.1	50.0	25.0
21.4	36.9	184.2	19.1
30.6	33.9	162.1	27.0
25.5	33.7	50.9	17.1
29.7	37.6	218.0	21.7
30.8	51.4	209.7	64.5
23.8	33.9	95.0	22.7
27.8	49.0	190.5	15.9
24.7	36.5	125.0	8.7
*21.6	39.3	204.8	11.1
*14.2	33.7	261.9	17.5
21.0	28.4	132.3	62.5
19.0	49.1	159.7	15.8
17.0	32.0	185.0	13.0
16.7	33.5	134.8	8.7
*14.8	36.7	136.4	27.3
*11.8	36.5	164.5	19.9
16.2	39.6	101.0	24.5
19.1	38.1	196.0	16.4
*10.2	25.1	150.9	15.2
*30.0	45.0	153.0	24.0
*10.7	19.2	121.4	22.1
26.7	36.1	101.4	21.6
26.0	32.0	164.2	20.8
20.8	35.5	153.8	12.2
*13.5	30.0	142.9	14.1
*12.8	14.9	171.2	11.7
8.1	26.1	65.6	9.7
Total	642.1	1,070.8	4,808.2
Average	20.7	34.5	155.1
			21.4

## The Terai

3 European and 3 Indian owned gardens  
(Indian owned gardens marked\*)

	Mortality rate per 1,000	Live birth rate per 1,000	Infantile mortality per 1,000 live births	Maternal mortality per 1,000 cases
	18.0	33.0	121.2	18.4
	*14.4	12.5	62.5	16.1
	19.4	30.1	164.0	21.0
	22.0	30.0	100.0	18.3
	*19.0	28.2	147.8	12.3
	*12.7	38.4	158.6	10.2
Total	105.5	172.2	754.1	96.3
Average	17.6	28.7	125.7	16.1
<i>Darjeeling</i>				
	15.4	31.3	134	.52
	25.1	30.7	200	0
	30.0	55.0	125	0
	13.0	45.0	88	0
	6.0	41.0	50	0
	19.0	39.0	155	25
	22.0	32.0	281	0
	15.0	33.0	0	0
	26.0	42.0	156	0
	35.0	41.6	167	0
	26.3	35.0	214	0
	29.0	38.4	57	0
	24.7	42.3	80	20
	23.9	38.6	140	20
	8.5	42.4	118	12
	19.0	47.4	126	0
	29.2	43.9	89	0
	26.8	38.6	76	0
	22.6	36.4	92	0
Total	416.5	753.6	2,308	129
Average	21.9	39.7	121.5	6.8
<i>SOUTH INDIA</i>				
<i>Nilgiris-Nilgiri—Wynaad</i>				
	9.5	28.7	47.0	19.1
	15.7	34.6	132.0	0
	†21.1	48.8	75.2	10.5
	14.0	24.0	110.0	0
	19.0	29.0	121.1	0
	23.0	36.0	158.8	0
	17.1	28.9	90.9	20.7
Total	119.4	230.0	735.0	50.3
Average	17.1	32.9	105.0	7.2
<i>Annamallais</i>				
	12.8	25.8	150.0	11.5
	8.5	27.2	156.9	16.4
	11.7	27.6	176.4	2.9
	*10.7	30.1	59.9	0
	13.2	22.0	170.0	3.4
	8.5	22.2	125.0	0
Total	65.4	154.0	838.2	34.2
Average	10.9	25.7	139.7	5.7
<i>Six Groups Comprising 26 gardens</i>				

\*Indian owned gardens.

†Average of 10 gardens in one group.

## APPENDIX IV

### SUMMARY OF VITAL STATISTICS OF SOME TEA ESTATES SURVEYED

	Average mortality rate per 1,000	Average live birth rate per 1,000	Average infantile mortality rate per 1,000 live births
<i>Assam</i>			
(1) 17 European owned gardens in the Assam Valley.	22.4	30.2	188.0
(2) 20 European owned gardens in the Surma Valley.	17.4	36.4	149.6
(3) Average of all European owned gardens surveyed in Assam for which figures were obtained.	19.9	33.3	168.8
(4) Five Indian owned gardens (3 in the Assam Valley) and 2 in the Surma Valley).	23.1	32.1	213.0
<i>Bengal</i>			
(5) 31 gardens in the Dooars (20 European owned and 11 Indian owned).	20.7	34.5	155.1
(6) 6 gardens in the Terai (3 European owned and 3 Indian owned).	17.6	28.7	125.7
(7) 19 European owned gardens in Darjeeling.	21.9	39.7	121.5
<i>South India</i>			
(8) 16 European owned gardens in Nilgiris and Nilgiri/Wynaad.	17.1	32.9	105.0
(9) 26 gardens in the Annamalais (2 Indian owned).	10.9	25.7	139.7
SUMMARY			
(1) Average of all gardens surveyed in Assam.	21.5	32.7	190.9
(2) Average of all gardens surveyed in Bengal.	20.1	34.2	134.1
(3) Average of all gardens surveyed in South India.	14.0	29.3	122.4
(4) City of Manchester for 1945 (for comparison).	14.4	18.2	55.3



## APPENDIX VI

### MEDICAL AND SURGICAL EQUIPMENT FOR A TEA GARDEN HOSPITAL

The following scale indicates the minimum medical and surgical equipment required for a tea garden hospital with (a) 10 beds ; (b) 20 beds.

It is hardly possible to lay down fixed standards for an industry as wide spread in its geographical distribution as the tea industry. Conditions vary considerably from area to area, and even from garden to garden. The list should therefore be regarded as a guide rather than as a fixed scale, and should be liable to modification on the recommendation of individual tea garden medical officers.

As it is not intended that major surgery will ordinarily be carried out in this type of hospital, much of the equipment, such as an operating table, examination couch, dispensary tables, and consulting room almiraahs, need not be elaborate, and can be constructed on the garden to the design of the medical officer.

It will be observed that the cost of initial equipment per bed in a 10 bedded hospital is approximately Rs. 747 whereas the comparable cost per bed in a 20 bedded hospital is Rs. 626. From a financial point of view it is therefore preferable for small gardens with a population of 1000 or less to combine in the provision of a combined garden hospital, provided the lay out of the gardens is such that every worker will be within easy reach of the hospital. In some areas the same principle may be extended even further, and it may be possible to set up combined garden hospitals with as many as 40 beds or more, with corresponding economy.

The provision of a Central Medical Store, and a Central Laboratory, to serve a group of garden hospitals, would of course reduce the cost per bed even more.

#### SECTION I

##### *Consulting Room Equipment*

Article  1	10 beds			20 beds				
	Number	Estimated cost		Number	Estimated Cost			
	2	3	4	5				
		Rs.	As.	Ps.		Rs.	As.	Ps.
Examination couch (local construct) . . . . .	1	50	0	0	1	50	0	0
Weighing machine . . . . .	1	26	0	0	1	26	0	0
Height measuring scale . . . . .	1	2	0	0	1	2	0	0
Stretcher . . . . .	1	20	0	0		20	0	0
		98 0 0				98 0 0		

## SECTION II

*Operation Theatre and Dressings Room Equipment*

Article	10 beds			20 beds		
	Number	Estimated cost		Number	Estimated cost	
1	2	3		4	5	
Brought forward	..	Rs.	As. Ps.	..	Rs.	As. Ps.
Instrument cabinet	1	150	0 0	1	150	0 0
Stand, lotion, with 2 basin, complete	1	42	0 0	1	42	0 0
Table, instrument, with 2 glass shelves	1	80	0 0	1	80	0 0
Table, operation, may be of local constr.	1	100	0 0	1	100	0 0
		470	0 0		470	0 0

## SECTION III

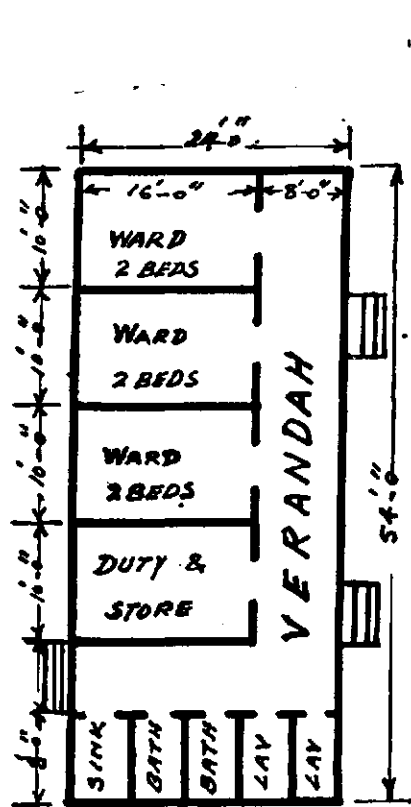
*Child Welfare Clinic Equipment*

Brought forward		470	0 0		470	0 0
Children's weighing machine	1	26	0 0	1	26	0 0
Babies' weighing machine	1	97	0 0	1	97	0 0
		593	0 0		593	0 0

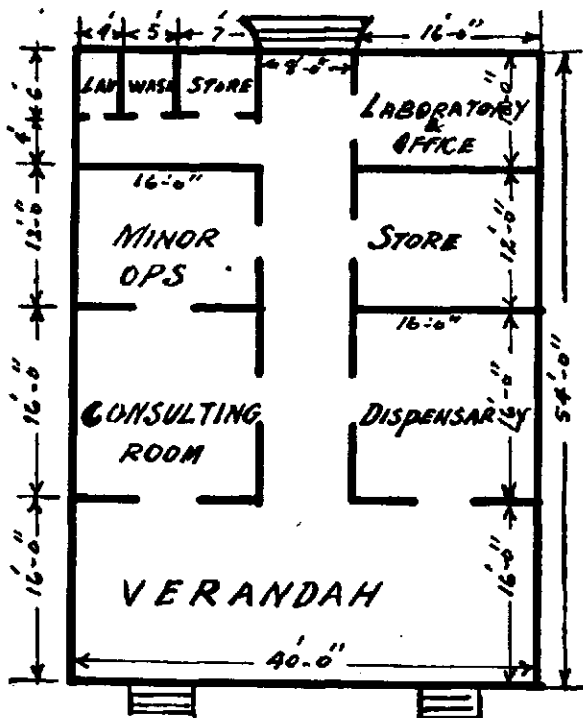
APPENDIX V

DIAGRAMMATIC SKETCH PLAN OF TEA GARDEN HOSPITAL  
WITH 20 BEDS TO SERVE A POPULATION  
OF 2000.

Scale = 16 FEET = 1 INCH

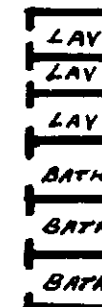
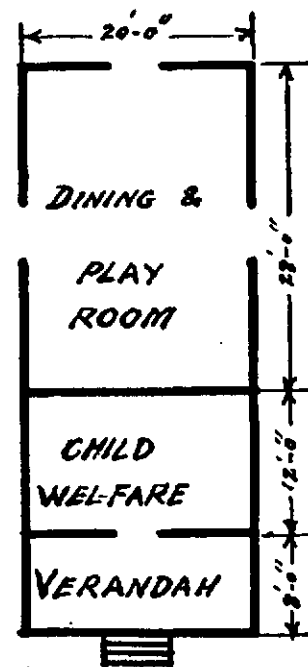


ISOLATION BLOCK

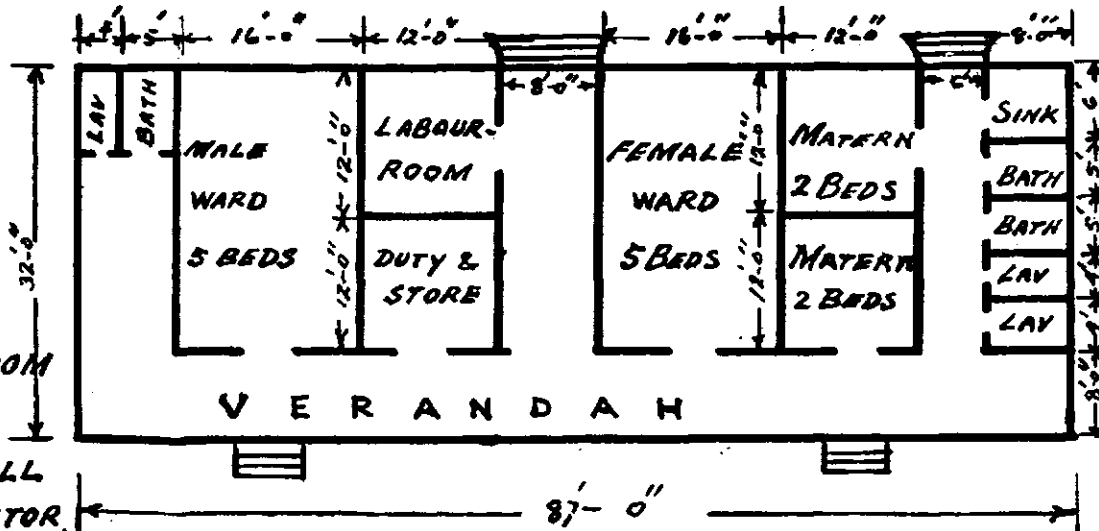


MAIN & OUT-PATIENT'S BLOCK

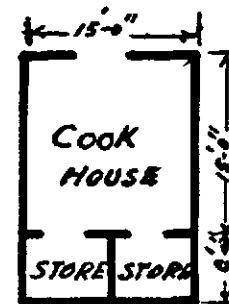
CHILDREN'S BLOCK



- 5 BED MALE WARD.
- 5 BED FEMALE WARD.
- 2 (2bed.) MATERNITY WARD.
- 3 (2bed) ISOLATION WARD.
- CHILD WELFARE CLINIC.
- CHILDREN'S DINING AND PLAY ROOM
- COOK HOUSE.
- LAUNDRY WITH BALKAN BARRELL  
OR OTHER CLOTHING DISINFECTOR.



GENERAL AND MATERNITY WARD



LAUNDRY WITH DISINFECTOR  
FOR CLOTHING



## SECTION IV

*General surgical and diagnostic instrument*

Article	10 beds			20 beds				
	Number	Estimated cost		Number	Estimated cost			
	2	3		4	5			
1		Rs. As. Ps.			Rs. As. Ps.			
Brought forward	..	593	0	0	..	593	0	0
aural specula, (3 sizes)	set 1	6	0	0	set 1	6	0	0
Catheter, I. R. size 6	2	0	12	0	3	1	2	0
Catheter, I. R. size 9	2	0	12	0	3	1	2	0
Clips, towel, cross action	6	12	6	0	9	18	9	0
Dissector, Kocher's	1	2	12	0	2	5	8	0
Douche, eye, glass	2	2	0	0	3	3	0	0
Dropper, eye	3	1	0	0	6	2	0	0
Forceps, artery, Spencer wells 5 inch	6	28	8	0	9	42	12	0
Forceps, artery, Spencer wells 7 inch	3	21	9	0	6	43	2	0
Forceps, artery, Halstead's	2	15	2	0	2	15	2	0
Forceps, Dental No. 1	1	4	7	0	1	4	7	0
" " No. 73	1	2	7	0	1	2	7	0
" " No. 74	1	3	12	0	1	3	12	0
" " No. 76	1	3	12	0	1	3	12	0
" " No. 94	1	3	12	0	1	3	12	0
" " No. 96	1	3	12	0	1	3	12	0
Forceps, dissecting, plain 5"	2	3	12	0	3	5	10	0
Forceps, dissecting, toothed 7"	2	8	6	0	3	12	9	0
Forceps, sinus, 7"	2	8	4	6	3	12	6	0
Forceps, sponge holding	2	15	12	0	2	15	12	0
Forceps, Sterilizer Cheate's	2	12	10	0	3	18	15	0
Forceps, tissue, Lane's, 6"	2	12	10	0	3	18	15	0
Gloves, I. R. Operation Size 7	4 pr.	5	12	0	6 pr.	8	10	0
Hæmoglobinometer scale, Talquist	2	7	14	0	3	11	13	0
Lens, hand	1	2	8	0	1	2	8	0
Mirror, forehead	1	10	0	0	1	10	0	0
Mirror, laryngeal 1	1	1	7	0	1	1	7	0
Nasal speculum, Thudicum's No. 2	1	3	5	0	1	3	5	0
Needle, aneurysm	2	2	14	0	2	2	14	0
Needle suture, cutting, F.C.T.P. Size 9	1 pkt. of 6	0	10	0	2 pkt.	1	4	0
Needle, suture, cutting, F.C.T.P. Size 15	1 pkt. of 6	0	11	0	2 pkt.	1	6	0
Needle, suture, cutting H.C.T.P. size 9	1 pkt. of 6	0	11	0	1 pkt. of 6	0	11	0
Needle, suture, cutting, H.C.T.P., Size 15	2 pkt.	0	11	0	2 pkt.	1	6	0
Needle, suture, cutting, strt. T.P.	1 pkt.	1	7	0	1 pkt.	1	7	0
Needle, suture, R.B.H.C. size 3	2 pkt.	1	9	0	2 pkt.	3	2	0
Needle, suture, R.B.H.C. Size 9	1 pkt.	1	9	0	1 pkt.	1	9	0
Needle holder, Sim's	1	4	9	0	1	4	9	0
Probe, silver, malleable	1	1	13	0	2	3	10	0
Probe and Director, Wheelhouse	1	3	12	0	1	3	12	0
Razor, safety, all metal	1	3	8	0	1	3	8	0
Reflex hammer	1	6	0	0	1	6	0	0
Scalpel, 2"	3	6	3	0	6	12	6	0
Scissors, curved on flat, Mayo, 7"	1	4	9	0	1	4	9	0
Scissors, straight, Mayo	1	4	14	0	2	9	12	0
Scissors, Shop, 7"	3	6	9	0	4	8	12	0
Scissors, straight, both ends sharp	2	5	0	0	3	7	8	0
Shades, eye	12	3	0	0	24	6	0	0
Sterilizer, high pressure with Primus Stone complete	1	5	13	0	1	5	13	0
Sterilizer, instrument portable	1	37	0	0	1	37	0	0
Speculum, rectal	1	2	13	0	1	2	15	0
Sphygmomanometer	1	97	0	0	1	97	0	0
Splint, knee, Thomas, 23"	1	1	13	0	1	1	13	0

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
1	2	3	4	5
Splint, knee, Thomas, 25"	1	1 13 0	1	1 13 0
Splinting, wire, Cramers 10 cm×100 cm	1	0 15 0	1	0 15 0
Test Type chart	1	3 0 0	1	3 0 0
Spud, eye.	1	3 2 0	1	3 2 0
Stethoscope, binaural	2	7 2 0	2	7 2 0
Syringe, ear, all metal	1	8 3 0	1	8 3 0
Syringe, hypodermic 2 cc. complete with needles.	2	4 6 0	3	6 9 0
Syringe, serum, 10 cc.	1	15 8 0	1	15 8 0
Syringe, Higginson, complete	1	3 4 0	1	3 4 0
Tape measure, linen	1	3 10 0	1	3 10 0
Thermometer, clinical	3	3 3 0	4	4 4 0
Tongue depressor, metal	2	2 14 0	3	4 5 0
Tourniquet, Sanway's anchor	1	7 9 0	1	7 9 0
Trocar and cannula	1	14 8 0	1	14 8 0
		1,588 9 0		1,694 8 0

## SECTION V

*Anæsthetic instruments and appliances*

Brought forward	..	1,588 9 0	..	1,694 8 0
Airway, Hewitt, large	1	2 8 0	1	2 8 0
Airway, Hewitt, small	1	2 8 0	1	2 8 0
Bottle, drop, with grooved stopper	2	2 8 0	2	2 8 0
Forceps tongue	1	3 9 0	1	3 9 0
Mask, Schimmelbusch, large	1	3 6 0	1	3 6 0
Mask, Schimmelbusch, small	1	3 6 0	1	3 6 0
Mouth gag, Sydenham	1	6 5 0	1	6 5 0
		1,612 11 0		1,718 10 0

## SECTION VI

*Obstetric instruments*

Brought forward	..	1,612 11 0	..	1,718 10 0
Pelvimeter	1	10 8 0	1	10 8 0
Forceps, axis traction	1	90 0 0	1	90 0 0
		1,713 3 0		1,819 2 0

## SECTION VII

Brought forward	..	1,713 3 0	..	1,819 2 0
Bag, ice, head	2	2 2 0	3	3 3 0
Bedpan, slipper	3	11 4 0	6	22 8 0
Bottle, hot water I.R.	3	9 6 0	6	18 12 0
Bowl, E.I. 4"	4	1 4 0	8	2 8 0
Bowl, E.I. 8"	3	1 11 0	6	3 6 0
Box, dressings	3	26 7 0	6	52 14 0
Bins with lids for soiled dressings	2	40 0 0	3	60 0 0
Cup, feeding	4	6 12 0	8	13 8 0
Jug, measure, E.I.	3	8 7 0	4	11 4 0
Sheeting waterproof I.R.	2 yds.	6 4 0	2 yds.	6 4 0
Sputum mugs	6	12 0 0	12	24 0 0
Towels, surgical	24	24 0 0	48	48 0 0
Tray E.I. kidney shaped 8	3	6 0 0	6	12 0 0
Urnal male	1	4 6 0	2	8 12 0
		1,873 2 0		2,108 1 0

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
1	2	3	4	5

## SECTION VIII

*Hospital beds, bedding and clothing*

Brought forward . . . . .		1,873 2 0		2,106 1 0
Blankets . . . . .	30	450 0 0	60	900 0 0
Mattresses . . . . .	10	250 0 0	20	500 0 0
Mattress covers . . . . .	15	150 0 0	30	300 0 0
Pillows . . . . .	15	60 0 0	30	120 0 0
Pillow covers . . . . .	30	30 0 0	60	60 0 0
Pyjama suits . . . . .	20	200 0 0	40	400 0 0
Saris . . . . .	20	100 0 0	40	200 0 0
Sheets . . . . .	40	200 0 0	80	400 0 0
Steel framed beds . . . . .	10	500 0 0	20	1,000 0 0
Waterproof sheets of 2 yds. . . . .	10	90 0 0	20	180 0 0
		<u>3,903 2 0</u>		<u>6,166 1 0</u>

## SECTION IX

*Operation clothing*

Brought forward . . . . .		3,903 2 0		6,165 1 0
Bags sterilising, medium . . . . .	3	15 0 0	6	30 0 0
Operation cap . . . . .	4	8 0 0	6	12 0 0
Operation masks . . . . .	4	13 8 0	6	20 4 0
Surgeon's apron . . . . .	3	30 0 0	4	40 0 0
Surgeon's gown . . . . .	3	60 0 0	4	80 0 0
Towels, surgical (theatre) . . . . .	12	15 0 0	24	30 0 0
		<u>4,044 10 0</u>		<u>6,378 5 0</u>

## SECTION X

*Surgical dressing*

Brought forward . . . . .		4,044 10 0		6,378 5 0
Cloth, bandage, loose weave . . . . .	80 yds.	20 0 0	140 yds.	35 0 0
Bandage, suspensory . . . . .	4	3 0 0	6	4 8 0
Bandage, triangular, uncompressed . . . . .	12	7 8 0	24	15 0 0
Gauze, surgical plain . . . . .	50 yds.	18 12 0	100 yds.	37 8 0
Lint, plain . . . . .	6 lb.	8 10 0	9 lb.	12 15 0
Pins, safety, asstd, . . . . .	1 gross	6 12 0	1 gross	6 12 0
Plaster, adhesive, zinc oxid spool, 3" x 10" yds. 4 spools.	4 spools.	12 0 0	8 spools.	24 0 0
Plaster, elastic adhesive 3" x 4 yds, in tins . . . . .	6	18 0 0	12	36 0 0
Tow, country . . . . .	10 lb.	3 12 0	20 lbs.	7 8 0
Plaster of Paris . . . . .	30 lb.	7 8 0	50 lbs.	12 8 0
Wool, cotton absorbent . . . . .	12 lb.	12 0 0	24 lbs.	24 0 0
		<u>4,162 8 0</u>		<u>6,594 0 0</u>

## SECTION XI

*Sutures and ligatures*

Brought forward . . . . .		4,162 8 0		6,594 0 0
Catgut, sterile, plain size 00 5 ft. strand in tube 4 tubes	4 tubes	3 12 0	8 tubes	7 8 0
Catgut, sterile, plain size 1 5 ft. strand in tube . . . . .	"	2 4 0	"	4 8 0
Catgut, chromic size 0 . . . . .	"	2 4 0	"	4 8 0
Catgut, chromic size 1 . . . . .	"	2 4 0	"	4 8 0
Cotton thread, No. 2 Reel of 50 yds. . . . .	1 Reel	0 4 0	1 Reel	0 4 0
Silkworm gut, medium unsterile, hank of 50 . . . . .	1 Hank	0 12 0	2 Hanks	1 8 0
		<u>4,174 0 0</u>		<u>6,616 12 0</u>

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
	2	3	4	5

## SECTION XII

*Drugs*

Brought forward	...	4,174 0 0	...	6,616 12 0
Acid Acetic B. P.	8 oz.	0 3 0	1 lb.	0 6 0
Acid Boric	2 lb.	1 6 0	4 lb.	2 12 0
Acid Hydrochlor, Dil	2 lb.	2 0 0	4 lb.	4 0 0
Acid Mandelic	4 oz.	3 0 0	8 oz.	6 0 0
Acid Salicy (Pulv).	8 oz.	1 8 0	1 lb.	3 0 0
Acid Sulph Aromat	1 lb.	1 0 0	2 lb.	2 0 0
Acid Sulph Dil	1 lb.	0 9 0	2 lb.	1 2 0
Aether Anaesthetic B. P.	4 lb.	8 12 0	8 lb.	17 8 0
Ammon, Chloride	2 lb.	2 0 0	4 lb.	4 0 0
Amylum B. P.	4 lb.	0 12 0	8 lb.	1 8 0
Aqua. Dist. B. P.	1 WR QT.	0 2 0	2 WR QT.	0 4 0
Argent Prot. Mit B.P.C (Argyrol)	1 oz.	3 2 0	2 oz.	6 4 0
Atropine Sulphas	2 dr.	3 14 0	4 dr.	7 12 0
Benzyl Benzoate B. P. C.	1 lb.	5 0 0	2 lb.	10 0 0
Calaminæ Præp	2 lb.	2 4 0	4 lb.	4 8 0
Chloral Hydras B.P.	2 lb.	5 0 0	2 lb.	10 0 0
Chloroform. B.P.	2 lb.	5 10 0	4 lb.	11 4 0
Chrysarobin B. P.	8 oz.	9 0 0	1 lb.	18 0 0
Elixir Diamorph et Terpin B.P.C.	2 lb.	7 3 0	4 lb.	14 6 0
Ext. Filicis Liq.	8 oz.	19 4 0	1 lb.	38 8 0
Ext. Glycyrrhizæ Liq. B.P.	3 lb.	2 1 0	6 lb.	4 2 0
Ext. Kurehi Liq.	1 lb.	3 2 0	2 lb.	6 4 0
Ferriet Ammon Cit B. P.	2 lb.	6 6 0	4 lb.	12 12 0
Formaldehyde, Liq	8 fl. oz.	1 0 0	1 lb.	2 0 0
Glycerinum	2 lb.	1 14 0	4 lb.	3 12 0
Glyc. Acid Carbol.	1 lb.	2 2 0	2 lb.	4 4 0
Hexamine	1 lb.	2 10 0	2 lb.	5 4 0
Hydrag Ox Flav B.P.	4 oz.	6 12 0	8 oz.	13 8 0
Hydrogen Peroxide	2 lb.	2 2 0	4 lb.	4 4 0
Iechthylol	2 oz	1 12 0	4 oz	3 8 0
Kaolin	7 lb.	1 12 0	14 oz	3 8 0
Liniment saponis	4 lb.	2 4 0	8 lb.	4 8 0
Liq. Ammon Acetat, Fort	5 lb.	4 11 0	10 lb.	9 6 0
Liq. Arsenicalis B.P.	1 lb.	0 5 0	2 lb.	0 10 0
Liq. Amon. Aromatic	2 lb.	1 12 0	4 lb.	3 8 0
Liq. Adrenalin Tart. 1 in 1,000	1 fl. oz.	1 5 0	2 fl. oz.	2 10 0
Liq. Cresol Saponis B.P.	3 lb.	1 2 0	6 lb.	2 4 0
Liq. Hydrag Perchlor.	2 lb.	1 6 0	4 lb.	2 12 0
Liq. Iodi Mitis	2 lb.	3 12 0	4 lb.	3 8 0
Liq. Morph Hydrochlor B.P.	1 lb.	1 7 0	2 lb.	6 14 0
Liq. Pias Car. Meth B.P.	1 lb.	0 8 0	2 lb.	1 0 0
Magnes Carb. Pond.	4 lb.	3 12 0	8 lb.	7 8 0
Magnes Sulphat.	7 lb.	1 5 0	14 lb.	2 10 0
Menthol B.P.	4 oz.	4 0 0	8 oz.	8 0 0
Ol. Cajuputi	4 oz.	5 12 0	8 oz.	11 8 0
Ol. Caryophylli	4 oz.	3 8 0	8 oz.	7 0 0
Ol. Chepapotium	4 oz.	6 4 0	8 oz.	12 8 0
Ol. Juniperi	4 oz.	2 0 0	8 oz.	4 0 0
Ol. Ricini	4 lb.	3 0 0	8 lb.	6 0 0
Ol. Terebinth	2 lb.	1 0 0	4 lb.	2 0 0
Ol. Vitaminatum	14 lb.	15 12 0	28 lb.	31 8 0
Paraffin Liq. B.P.	2 lb.	6 0 0	4 lb.	12 0 0
Paraffin Molle	7 lb.	2 10 0	14 lb.	5 4 0
Pasta Zinci Co. B.P.C.	2 lb.	12 0 0	4 lb.	24 0 0



Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
l. Digitalis Co. B.P.C.	1,000	1 11 0	2,000*	3 6 0
Mass Bromid.	1 lb.	3 3 0	2 lb.	6 6 0
Mass Citrate	1 lb.	2 10 0	2 lb.	5 4 0
Mass Iodid.	2 lb.	4 0 0	4 lb.	8 0 0
Mass Permanganate	1 lb.	5 2 0	2 lb.	10 4 0
Novarine Sulphate	$\frac{1}{2}$ oz.	7 13 0	1 oz.	15 10 0
olv. Creta Aromatic	2 lb.	2 0 0	4 lb.	4 0 0
olv. Tragacanth Co.	1 lb.	8 0 0	2 lb.	16 0 0
Quinine Hydrochlor	$\frac{1}{2}$ lb.	18 0 0	$\frac{1}{2}$ lb.	36 0 0
Quinine Sulphas	2 lb.	60 0 0	4 lb.	120 0 0
Rauwolfia B.P.	$\frac{1}{2}$ oz.	13 0 0	1 oz.	26 0 0
Sodii. Bicarbonas B.P.	7 lb.	0 14 0	14 lb.	1 12 0
Sodii. Chlorid B.P.	2 lb.	1 8 0	4 lb.	3 0 0
Sodii. Salicylas B.P. (Crys.)	7 lb.	14 0 0	14 lb.	28 0 0
Soft Soap (Commercial)	4 lb.	2 0 0	8 lb.	4 0 0
Spirit Aether Nitros	2 lb.	1 2 0	4 lb.	2 4 0
Spirit Ammon Aromatic	2 lb.	1 12 0	4 lb.	3 8 0
Spirit Methyl. Indust.	7 lb.	4 6 0	14 lb.	8 1 0
Sulphanilamide (Pulv.)	2 lb.	16 14 0	4 lb.	33 12 0
Sulphur Praecipitatum	2 lb.	2 14 0	4 lb.	5 12 0
Syrupi Aurantii	3 lb.	6 15 0	6 lb.	13 14 0
abs. Aspirin gr. 5	1,000	3 5 0	2,000	6 10 0
abs. Acid Ascorbic mg. 50	200	16 4 0	400	32 8 0
abs. Acid Nicotinic mg. 50	1,000	16 4 0	2,000	32 8 0
abs. Calc. Sod. Lactate gr. 7 $\frac{1}{2}$	1,000	8 9 0	2,000	17 2 0
abs. Ephedrine Hydrochlor gr. $\frac{1}{2}$	100	9 14 0	200	19 12 0
abs. Ferri. Sulphas. gr. 5	5,000	7 13 0	10,000	15 10 0
abs. Hydrarg. cum Creta gr. 1	1,000	6 11 0	2,000	13 6 0
abs. Laxative Co. B.P.C.	1,000	13 0 0	2,000	26 0 0
abs. Paludrine (If suppressive Paludrine treatment is practised more tablets will be required)	3,000	57 0 0	6,000	114 0 0
abs. Phenobarbitonum Gr. 1	500	6 15 0	1,000	13 14 0
abs. Sulphanilamide Gr. 7 $\frac{1}{2}$	1,000	14 0 0	2,000	28 0 0
abs. Sulphapyridin. Gr. 7 $\frac{1}{2}$	1,000	35 0 0	2,000	70 0 0
abs. Sulphathiazole Gr. 7 $\frac{1}{2}$	1,000	70 0 0	2,000	140 0 0
abs. Thyroid B.P. Gr. 1	1,000	10 5 0	2,000	20 10 0
Tetrachlor ethylene	15 lb.	15 0 0	30 lb.	30 0 0
Tinct. Belladonna B.P.	1 lb.	2 6 0	2 lb.	4 0 0
Tinct. Benzoini Co.	1 lb.	1 14 0	2 lb.	3 12 0
Tinct. Camph Co.	4 lb.	2 4 0	8 lb.	4 8 0
Tinct. Catechu	1 lb.	1 0 0	2 lb.	2 0 0
Tinct. Chloro, et Morph. Co. B.P.C.	2 lb.	74 12 0	4 lb.	49 8 0
Tinct. Digitalis B.P.	2 lb.	1 6 0	4 lb.	2 12 0
Tinct. Hyoscyamus	1 lb.	8 0 0	2 lb.	16 0 0
Tinct. Ipecachuana	2 lb.	6 4 0	4 lb.	12 8 0
Tinct. Nucis Vomica	2 lb.	2 0 0	4 lb.	4 0 0
Tinct. Opii.	1 lb.	2 0 0	2 lb.	4 0 0
Ing. Acid Boric Flav. B.P.	5 lb.	3 7 0	10 lb.	6 14 0
Ing. Gallae cum Opio.	2 lb.	4 2 0	4 lb.	8 4 0
Ing. Hydrarg. Ammon Dil B.P.	5 lb.	12 3 0	10 lb.	24 6 0
Ing. Picis carb Co. B.P.C.	2 lb.	3 12 0	4 lb.	7 8 0
Ing. Iodi Denigrescens B.P.C. 2 lb.	2 lb.	3 12 0	4 lb.	7 8 0
Ing. Resorcin Co. B.P.C.	2 lb.	5 12 0	4 lb.	11 8 0
Ing. Sulphuris B.P.	7 lb.	3 8 0	14 lb.	7 0 0
Unc. Sulph.	1 lb.	1 0 0	2 lb.	2 0 0
Unc. Oxide	4 lb.	2 0 0	8 lb.	4 0 0
		4,931 5 0		9,131 6 0

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
<b>SECTION XIII</b>				
<i>Drugs for use by injection</i>				
Brought forward	4,931	5 0	8,131	6 0
Ext. Hepatis (for injection 2 cc. amp. of 400 G. per amp.)	50 amp.	59 6 0	100 amp.	118 12 0
Inject. Procaine et Adrenalin Fort B. P. in rubber capped bottle of 25 cc.	1 bottle	1 4 0	1 bottle	1 4 0
Inject. Quin Dihydrochlor B.P.C. (amp. of 10 cc.)	50 amp.	6 4 0	100 amp.	12 8 0
Insulin (200 units) Tube of 5 cc.	6 Tubes	7 14 0	12 Tubes	15 12 0
Nikethamide B.P. Amp. of 1.7 cc. Box of 5	2 Boxes	5 4 0	4 Boxes	16 8 0
Pitressin Amp. of 1 cc. Box of 6	6 Boxes	52 10 0	12 Boxes	105 4 0
Tab. of Apomorphine gr. 1/10, Tube of 20	1 Tube	1 0 0	1 Tube	1 0 0
Tab. Digitalin 1/100, Tube of 20	1 Tube	0 5 0	2 Tubes	0 10 0
Tab. Emetine Hydrochlor. gr. 1/4, Tube of 20	10 Tube	31 14 0	20 Tubes	63 12 0
Tab. Morph. Sulph. gr. 1/4, Tube of 20	4 Tubes	6 0 0	8 Tubes	12 0 0
Tab. Strych Hydrochlor gr. 1/60, Tube of 20	2 Tubes	0 14 0	4 Tubes	1 12 0
Urea Stibamine (amp. of 0.1 G.)	50 amp.	6 0 0	100 amp.	12 0 0
	5,110	0 0	8,486	8 0
<b>SECTION XIV</b>				
<i>Sera and Vaccines</i>				
Brought forward	5,110	0 0	8,486	8 0
Anti-toxin Diphtheri Amp. of 10,000 units	5 amps.	29 11 0	10 amps.	59 6 0
Anti-toxin Tetanus Amp. of 1,500 A.U.	10 amps.	10 0 0	20 amps.	20 0 0
Serum, Antivenom Amp. of 10 cc. (conc.)	5 amps.	23 12 0	10 amps.	47 8 0
Vaccine, anti. cholera amp. of 10 cc.	25 amps.	23 7 0	50 amps.	46 14 0
Vaccine T.A.B. amp. of 10 cc.	25 amps.	46 14 0	50 amps.	93 12 0
Vaccine anti-rabic	2 courses	2 0 0	4 courses	4 0 0
Vaccine lymph. amp. of 1 cc.	3 amps.	0 15 0	6 amps.	1 14 0
	5,246	11 0	8,759	14 0
<b>SECTION XV</b>				
<i>Clinical laboratory equipment stains and reagents</i>				
Brought forward	5,246	11 0	8,759	14 0
Filter papers pkt. of 100	1 pkt.	0 15 0	2 pkts.	1 14 0
Flask, conical 100 ml.	2	0 10 0	2	0 10 0
Funnel, glass	1	0 6 0	1	0 6 0
Glass, cover, pkt. of 1/2 oz.	1 pkt.	4 14 0	1 pkt.	4 14 0
Litmus paper, blue	6 books	1 8 0	12 books	3 0 0
Litmus paper, red	6 books	1 14 0	12 books	3 12 0
Microscope, complete with oil immersion lens. (This will not be essential if a Central Laboratory is provided).	1	972 0 0	1	972 0 0

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
Rod, glass	2	0 6 0	3	0 9 0
Slide, microscope 3" x 1"	36	2 0 0	72	4 0 0
Spirit Lamp	1	4 12 0	1	4 12 0
Test tube	12 doz.	4 8 0	18 doz.	6 12 0
Test tube holder	1	0 12 0	1	0 12 0
Test tube stand	1	0 15 0	1	0 15 0
Trough, staining, for 5 slides	1	5 0 0	1	5 0 0
Urine glass, specimen	2	3 2 0	3	4 11 0
rinometer	1	2 8 0	1	2 8 0

*Reagents and stains*

Acetic Acid B.P.	8 fl. oz.	0 3 0	1 lb.	0 6 0
Benedict's solution (qualitative)	1 lb.	0 10 0	2 lb.	1 4 0
Caustic soda	4 fl. oz.	1 12 0	8 fl. oz.	3 8 0
Nitric Acid (conc.)	8 fl. oz.	1 3 0	1 lb.	2 6 0
Oil Cedar wood for use with oil immersion lens	2 fl. oz.	2 8 0	4 fl. oz.	5 0 0
Ozonic Aether	8 fl. oz.	3 0 0	1 lb.	6 0 0
Stain, geosin, pure Tube of 5 G.	1 tube	0 13 0	2 tubes	1 10 0
Stain, gentian violet	1 G.	0 1 0	2 G.	0 2 0
Stain, coishmann, powder	1 G.	0 9 0	2 G.	1 2 0
Stain, methylene blue	1 G.	0 1 0	2 G.	0 2 0
Sulphur Sublimatum	4 oz.	0 15 0	8 oz.	1 14 0
Tinct. Guaiacum	4 oz.	1 0 0	8 oz.	2 0 0
Xylo, pure	1 lb.	4 7 0	2 lb.	8 14 0
		6,269 15 0		9,810 9 0

SECTION XVI

*Dispensary equipment*

Brought forward		6,269 15 0		9,810 9 0
Bottle green round N.M. 1 lb.	6	0 15 0	12	1 8 0
Bottle green round 8 oz.	3	0 6 0	6	0 12 0
Bottle green Winchester Qt.	8	2 0 0	12	3 0 0
Bottle medicine grad. 6 oz.	2 grosses	108 0 0	4 grosses	216 0 0
Bottle poison 1 oz.	$\frac{1}{2}$ gross	9 0 0	1 gross	18 0 0
Bottle poison 2 oz.	$\frac{1}{2}$ gross	13 8 0	1 gross	27 0 0
Corks, asstd. sizes	6 grosses	72 8 0	12 grosses	144 0 0
Corkscrew	1	0 8 0	1	0 8 0
Funnel 4 oz. E.L.	2	1 4 0	2	1 4 0
Measure glass 4 oz.	2	1 12 0	3	2 10 0
Measure glass 2 oz.	2	2 2 0	3	3 3 0
Mortar, composition 8"	1	11 5 0	1	11 5 0
Mortar, pestle	1	2 5 0	1	2 5 0
Pot, delf with cover 8 oz.	6	4 2 0	12	8 4 0
Scales dispensing with weights	1	20 0 0	1	20 0 0
Scales counter to weigh up to 4 lb. with weights	1	20 0 0	1	20 0 0
Slab ointment		1 4 0	1	1 4 0
Spatula, holus	2	2 2 0	2	2 2 0
Table, teuk, zinc top (local construct.)	1	50 0 0	1	50 0 0
Tin opener	1	4 1 0	1	4 1 0
		6,596 6 0		10,347 11 0

Article	10 beds		20 beds	
	Number	Estimated cost	Number	Estimated cost
<b>SECTION XVII</b>				
<i>Hospital hygiene chemicals and appliances</i>				
Brought forward . . . . .		6,596 6 0		10,347 11 0
Bleaching Powder . . . . .	36 lb.	9 0 0	72 lb.	18 0 0
Cresol soap . . . . .	34 lb.	22 8 0	68 lb.	45 0 0
D.D.T. . . . .	10 lb.	40 0 0	20 lb.	80 0 0
Kerosene . . . . .	5 gals.	3 0 0	10 gals.	6 0 0
Spray, insect, pyrethrum solution . . . . .	2 gals.	5 12 0	4 gals.	11 8 0
		<u>6,676 10 0</u>		<u>10,508 3 0</u>

<b>SECTION XVIII</b>				
<i>Furniture of Local Construction</i>				
Brought forward . . . . .		6,676 10 0		10,508 3 0
Almirah . . . . .	4	300 0 0	8	600 0 0
Basin and water stand . . . . .	..		1	4 0 0
Couch . . . . .	..		1	30 0 0
Bedside Table . . . . .	5	100 0 0	1	200 0 0
Benches . . . . .	2	40 0 0	3	60 0 0
Chairs . . . . .	6	60 0 0	12	120 0 0
Doctor's Table . . . . .	1	50 0 0	2	100 0 0
Dressing Trolleys with glass top . . . . .	..		6	480 0 0
Screens, movable, ward . . . . .	3	30 0 0	6	80 0 0
Shelves . . . . .	3	75 0 0	6	150 0 0
Stools . . . . .	5	25 0 0	10	50 0 0
Table large . . . . .	1	75 0 0	1	75 0 0
Table small . . . . .	2	40 0 0	4	80 0 0
Total . . . . .		<u>7,471 10 0</u>		<u>12,517 3 0</u>

## APPENDIX VII

## DRAFT MEDICAL FORMULARY FOR TEA GARDEN HOSPITALS

During the tour it was observed that there was very little attempt at standardisation of prescribing in connection with tea estate medical services. It was also noticed that there was a marked tendency to use proprietary preparations when official preparations of at least therapeutic efficiency were available, resulting in unnecessary expense.

Whilst it is agreed that standardisation of medical prescribing is of limited value, and that no attempt should be made to discourage individuality in prescribing, it is considered that the provision of a Standard Formulary is likely to be of considerable assistance to the tea garden doctor in the daily routine of his practice.

The following draft is therefore submitted, though not without some diffidence. In preparing the draft the aim has been to provide a selection of prescriptions sufficient in range to meet the ordinary requirements of tea garden medical practice, to retain as far as possible well-tried preparations, and to eliminate non-essential drugs.

Other formularies, including the National War Formulary of the Ministry of Health, U.K., and the various Provincial Formularies, have been freely drawn upon and it is hoped that this general acknowledgment will be accepted.

## GENERAL FORMULARY

## APPLICATIONS

*Application of Benzyl Benzoate.*

Benzyl Benzoate . . . . .	1 oz.
Soft soap . . . . .	1 oz.
Surgical spirit . . . . .	1 fl. oz.

To be applied with a brush.

## AUSTRILLAE (EAR DROPS)

*Aurist. Acid Boric.*

Boric Acid . . . . .	4 gr.
Industrial Meth. Spirit . . . . .	50 min.
Water to . . . . .	½ fl. oz.

*Aurist. Resorcinal.*

Resorcinol . . . . .	2 gr.
Industrial Meth. Spirit . . . . .	180 min.
Water to . . . . .	½ fl. oz.

*Aurist. Sodii Bicarbonate.*

Sod. Bicarb . . . . .	15 gr.
Glycerine . . . . .	80 min.
Water to . . . . .	1 fl. oz.

## CAPSULES

<i>Caps. Creosoti</i> . . . . .	1 and 3 min.
<i>Caps. Filicis (Male fern)</i> .	
Extract of male fern . . . . .	15 min.

## COLLODIUM

*Collod. Acid Salicylic.*

Salicylic Acid . . . . .	27 gr.
Flexible Collodion to . . . . .	120 min.

## COLLUTORIA (MOUTH WASHES)

*Collut. Formaldehyde.*

Solution of Formaldehyde. . . . .	120 min.
Water to . . . . .	8 fl. oz.

## COLLYRIA (EYE LOTIONS)

*Collyr. Acid Boric.*

Boric Acid . . . . .	52 gr.
Distilled water to . . . . .	6 fl. oz.

*Collyr. Zinci Co.*

Zinc Sulphate . . . . .	10 gr.
Boric Acid . . . . .	26 gr.
Distilled water to . . . . .	6 fl. oz.

## GARGLES

*Garg. Pot Chlorat, et Phenol.*

Potassium Chlorate . . . . .	120 gr.
Liquified Phenol . . . . .	60 min.
Water to . . . . .	8 fl. oz.

Label :—One tableoonful to  $\frac{1}{2}$  pint of warm water.

*Garg. Potass. Permanganate.*

Potassium Permanganate . . . . .	15 gr.
Water to . . . . .	8 fl. oz.

Label :—Dilute with four parts of warm water.

## GUTTAE OPHTHALMICAE (EYE DROPS)

*Guttae Argent Nitratiss.*

Silver Nitrate . . . . .	$\frac{1}{2}$ gr.
Distilled water to . . . . .	120 min.

*Guttae Argentoprote*

Silver Protein. . . . .	10 gr.
Distilled water to . . . . .	120 min.

*Guttae Atropinae.*

Atropin Sulphate . . . . .	$\frac{1}{2}$ gr.
Distilled water to . . . . .	120 min.

*Guttae Zinci Sulphat. et Acid Boric.*

Zinc Sulphate . . . . .	½ gr.
Boric Acid . . . . .	1 gr.
Distilled water to . . . . .	120 min.

## HAUSTUS (DRAUGHTS)

*Haustr. Tetrachlorethylene.—*

Tetrachlorethylene . . . . .	4 ml.
Saturated solution of Sodium Sulphate . . . . .	2 fl. oz.
To be freshly prepared.	

*Haustr. Potass. Brom. et Chloral.*

Potassium Bromide . . . . .	15 gr.
Chloral Hydrate . . . . .	10 gr.
Syrup of Ginger . . . . .	60 min.
Water to . . . . .	1 fl. oz.

*Haustr. Filicis (Male fern.).*

Extract of Male Fern. . . . .	60 min.
Syrup of Ginger . . . . .	60 min.
Mucilage of Tragacanth . . . . .	120 min.
Water to . . . . .	1 fl. oz.

*Haustr. Salinae.*

Magnesium Sulphate . . . . .	240 gr.
Peppermint water to . . . . .	1 fl. oz.

## INSUFFLATIONS (EAR POWDERS)

*Insufflat. Iodi et Acid Boric.*

Iodine . . . . .	1 gr.
Boric Acid powder (fine) to . . . . .	120 gr..

*Insufflat. iodoform.*

Iodoform . . . . .	1 gr.
Boric Acid powder (fine) to . . . . .	120 gr.

## INJECTIONS

TO BE ADMINISTERED BY THE MEDICAL OFFICER

<i>Tabellae Apomorphine Hydrochlor</i> . . . . .	gr. 1/100
<i>Tabellae Digitalin</i> . . . . .	gr. 1/100
<i>Tabellae Emetine Hydrochlor</i> . . . . .	gr. ½
<i>Inject Quinin. Di-Hydrochlor</i> . . . . .	B.P.C.
<i>Tabellae Morphin. Hydrochlor.</i> . . . . .	gr. ½
<i>Insulin (200 units)</i> . . . . .	tube of 5 cc.
<i>Nikethamide B.P.</i> . . . . .	Amp. of 1.7 cc.
<i>Pitressin</i> . . . . .	Amp. of 1 cc.
<i>Inject. Procaine et Adrenalin Fort.</i> . . . . .	Rubber capped bottle of 25 cc.
<i>Tabellae Strychnin. Hydrochlor.</i> . . . . .	gr. 1/60.
<i>Urea Stibamine</i> . . . . .	Amp. of 0.1 G.

## LINIMENTS

*Liniment. Album.*

Soft soap . . . . .	66 gr.
Ammonium Chloride . . . . .	11 gr.
Oil of Turpentine . . . . .	240 min.
Warm water to . . . . .	2 fl. oz.

## LOTIONS

*Lotio Acid Boric.*

Acid Boric . . . . .	80 gr.
Water to . . . . .	8 fl. oz.

*Lotio Calaminae*

Calamine . . . . .	175 gr.
Zinc Oxide . . . . .	175 gr.
Glycerine . . . . .	120 min.
Water to . . . . .	8 fl. oz.

*Lotio Proflavine.*

Proflavine Sulphate . . . . .	3½ gr.
Sodium Chloride . . . . .	31½ gr.
Water to . . . . .	8 fl. oz.

*Lotio Phenolis.*

Liquefied Phenol . . . . .	100 min.
Water to . . . . .	8 fl. oz.

Dilute with an equal quantity of hot water before use.

*Lotio Picis Carb Alk. B.P.C.*

Solution of Coal Tar . . . . .	80 min.
Sodium Bicarbonate . . . . .	44 gr.
Water to . . . . .	8 fl. oz.

*Lotio Plumbi cum Opio.*

Liquid Extract of Opium B.P.C. . . . .	10 min.
Strong soln. of Lead Acetate . . . . .	100 min.
Water to . . . . .	8 fl. oz.

Dilute with an equal quantity of water before use.

*Lotio Zinci Sulphate.*

Zinc Sulphate . . . . .	17½ gr.
Soln. of Bordeaux B. . . . .	20 min.
Water to . . . . .	4 fl. oz.

## MIXTURES

*Mist. Alba.*

Sodium Sulphate . . . . .	40 gr.
Light Magnesium Carbonate . . . . .	10 gr.
Peppermint water to . . . . .	½ fl. oz.

*Mist. Ammonium Chloride.*

Ammonium Chloride . . . . .	15 gr.
Aromatic Soln. of Ammonia . . . . .	5 min.
Liquid extract of Liquorice . . . . .	15 min.
Water to . . . . .	½ oz.

*Mist. Ammonium Mandelate.*

Mandelic Acid . . . . .	40 gr.
Strong Soln. of Ammonia . . . . .	5 min.
Liquid extract of Liquorice . . . . .	15 min.
Chloroform water to . . . . .	½ fl. oz.

*Mist. Astringens cum Opio.*

Dilute Sulphuric Acid . . . . .	10 min.
Tincture of Catechu . . . . .	20 min.
Tincture of Opium . . . . .	15 min.
Glycerine . . . . .	10 min.
Water to . . . . .	½ fl. oz.



**Mist. Bromid. et Arsenic**

Potassium Bromide . . . . .	15 gr.
Arsenical solution . . . . .	1 gr.
Liquid Extract of Liquorice . . . . .	5 min.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Camphorae Comp.**

Camphorated Tincture of Opium . . . . .	16 min.
Strong Soln. of Ammon. Acetate . . . . .	20 min.
Ammonium Carbonate . . . . .	1 $\frac{1}{2}$ gr.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Cascara.**

Liquid Extract of Cascara . . . . .	20 min.
Ammonium Carbonate . . . . .	2 gr.
Liquid Extract of Liquorice . . . . .	20 min.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Creosot. et Iodide**

Creosote . . . . .	2 min.
Potassium Iodide . . . . .	5 gr.
Liquid Extract of Liquorice . . . . .	20 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Diaphoretic**

Potassium Citrate . . . . .	20 gr.
Soln. of Ammonium Acetate . . . . .	120 min.
Nitrous Spirit of Aether . . . . .	10 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Expect. Sedativ.**

Compound Tincture of Camphor . . . . .	20 min.
Tincture of Ipecachuana . . . . .	10 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Ferri Aperiens.**

Ferrous Sulphate . . . . .	3 gr.
Sodium Sulphate . . . . .	30 gr.
Dilute Sulphuric Acid . . . . .	5 min.
Peppermint water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Ferri et Arsen. et Strych.**

Iron and Ammonium Citrate . . . . .	10 gr.
Tincture of Nux Vomica . . . . .	5 min.
Liquor Arsenicalis . . . . .	5 min.
Peppermint water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Hexaminae.**

(i) Hexamine . . . . .	10 gr.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.
Dose:— $\frac{1}{2}$ fl. oz. half an hour before meals	
(ii) Acid Sodium Phosphate . . . . .	20 gr.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.
Dose:— $\frac{1}{2}$ fl. oz. half an hour after meals.	

**Mist. Hydrargyri et Iodid.**

Solution of Mercuric Iodide . . . . .	60 min.
Potassium Iodide . . . . .	5 gr.
Infusion of Quassis . . . . .	120 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

**Mist. Kaolin et Morphin.**

Light Kaolin . . . . .	10 gr.
Sodium Bicarbonate . . . . .	10 gr.
Tincture of Chloroform and Morphine B.P.C . . . . .	10 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.

<i>Mist. Magnesium Carbonate</i>	
Heavy Magnesium Carbonate . . . . .	10 gr.
Sodium Bicarbonate . . . . .	10 gr.
Dilute Hydrocyanic Acid . . . . .	3 min.
Peppermint water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Opii Acid</i>	
Liquid extract of Opium . . . . .	5 min.
Dilute Hydrochloric Acid . . . . .	10 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Potass. Citrat. (Mist. Diuretic)</i>	
Potassium Citrate . . . . .	30 gr.
Potassium Bicarbonate . . . . .	10 gr.
Tincture of Hyoseyamus . . . . .	15 min.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Potass. Iodid.</i>	
Potassium Iodide . . . . .	10 gr.
Liquid Extract of Liquorice . . . . .	30 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Quinin.</i>	
Quinine Sulphate . . . . .	5 gr.
Dilute Sulphuric Acid . . . . .	5 min.
Syrup of Orange . . . . .	30 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Rhei. Comp.</i>	
Rhubarb (powdered) . . . . .	3 gr.
Light Magnesium Carbonate . . . . .	10 gr.
Ginger (powdered) . . . . .	4 gr.
Sodium Bicarbonate . . . . .	10 gr.
Peppermint water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Sodii Salicylat</i>	
Sodium Salicylate . . . . .	15 gr.
Sodium Bicarbonate . . . . .	15 gr.
Syrup of Orange . . . . .	60 min.
Water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Stramonii et Iodid.</i>	
Potassium Iodide . . . . .	3 gr.
Tincture of Stramonium . . . . .	20 min.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. pro Spleen</i>	
Quinine Hydrochlorid . . . . .	3 gr.
Liq. Arsenici Hydrochlorid . . . . .	3 min.
Liq. Ferri Perchlor . . . . .	10 min.
Magnesium Sulphate . . . . .	60 gr.
Water to . . . . .	$\frac{1}{2}$ fl. oz.
<i>Mist. Tussi Sedativ</i>	
Elix Diuromph. et Terpin B.P.C. . . . .	30 min.
Menthol . . . . .	3 gr.
Chloroform water to . . . . .	$\frac{1}{2}$ fl. oz.

## PASTES

*Pasta Pivis Carbonis*

Commercial Coal Tar . . . . .	14 gr.
Zinc Oxide . . . . .	120 gr.
Starch . . . . .	120 gr.
Yellow Soft Paraffin to . . . . .	480 gr.

*Lassar's Paste*—

Zinc Oxide, finely sifted . . . . .	115 gr.
Starch, finely sifted . . . . .	115 gr.
Salicylic Acid, finely sifted . . . . .	10 gr.
Yellow Soft Paraffin to . . . . .	480 gr.

## PAINTS

*Pigment Iodi Co. B.P.C. (Mendl's Paint)*—

Iodine . . . . .	5½ gr.
Potassium Iodide . . . . .	11 gr.
Water . . . . .	12 min.
Oil of Peppermint . . . . .	3½ min.
Glycerine to . . . . .	1 fl. oz.

*Pigment Triplez*—

Crystal Violet . . . . .	1 gr.
Brilliant green . . . . .	1 gr.
Proflavine Sulphate . . . . .	½ gr.
Distilled water to . . . . .	1 fl. oz.

## PILLS

- Pil. Hydrarge B.P.* 4 gr.  
*Pil. Digitalis Co. B.P.C. (Guy's Pill)*  
*Pil. Rhei Co. B.P.* 5 gr.

## TABLETS

- Tab. Acid Acetylsalicylic B.P.* 5 gr (*Aspirin*)  
*Tab. Acid Ascorbic B.P.* 50 mg. (*Vitamin C* for therapeutic use)  
*Tab. Acid Nicotinic B.P.* 50 mg.  
*Tab. Aneurin Hydrochlor.* 3 mg.  
*Tab. Calcium et Sodium Lactate B.P.C.* 7½ gr.  
*Tab. Calomel B. P.* 3 gr.  
*Tab. Ephedrine Hydrochlor. B.P.* ½ gr.  
*Tab. Ferri Sulphas B.P.* 5 gr.  
*Tab. Hydrarge cum Creta* 1 gr.  
*Tab. Phenobarbiton B.P.* 1 gr.  
*Tab. Potass. Permanganat.* 1 gr.  
*T b. Quinine Sulphat* 5 gr.  
*Tab. Santonin* 1 gr.  
*Tab. Stann. Co. B.P.C.*  
*Tab. Syrupi Eastonii B.P.C* (*Equal to 60 min. of Syrup*)  
*Tab. Sulphanilamide B.P.* 7½ gr. (0.5 G.)  
*Tab. Sulphapyridine B.P.* 7½ gr. (0.5 G.)  
*Tab. Sulphathiazol B.P.* ( 7½ gr. (0.5 G.)  
*Tab. Thyroid B.P.* 1 gr.  
*Tab. Yeast B.P.C.* 5 gr.

## UNGUENTS (Ointments)

- Ung. Acid Benzoic Co. (Whitefield's Ointment)*—  
 Acid Salicylic . . . . . 12 gr.  
 Acid Benzoic . . . . . 20 gr.  
 Soft Paraffin to . . . . . 480 gr.

*Ung. Acid Boric Flav. B.P.*

- Ung. Chrysarobin*—  
 Acid Salicylic . . . . . 10 gr.  
 Chrysarobin . . . . . 25 gr.  
 Ichthyol . . . . . 20 gr.  
 Soft Paraffin to . . . . . 480 gr.

- Ung. Gallae cum Opio. B.P.*  
*Ung. Hydrarg. Ammon. dil. B.P.*  
*Ung. Iodi Denigrescens B.P.C.*  
*Ung. Picis Carb. Co. B.P.C.*

*Ung. Resorcin Co. B.P.C.**Ung. Sulphanilamide*

Sulphanilamide . . . . .	48 gr.
Hydrous Ointment to . . . . .	480 gr.

*Ung. Sulphuris B.P.**Ung. Sulph. et Salicylic Acid—*

Sulph. Præcipitat . . . . .	10 gr.
Acid Salicylic . . . . .	10 gr.
Soft Paraffin to . . . . .	480 gr.

## VACCINES AND SERA

*To be administered by the Medical Officer—*

<i>Anti-toxin diphtheria</i> . . . . .	Amp. of 10,000 units.
<i>Serum anti-venom</i> . . . . .	Amp. of 10 c.c. (conc.)
<i>Vaccine anti-cholera</i> . . . . .	Amp. of 10 c.c.
<i>Vaccine anti-typhoid and paratyphoid</i> . . . . .	Amp. of 5 c.c.
<i>Vaccine lymph</i> . . . . .	Amp. of 1 c.c.

Date of Examination and Certification	Initials of Medical Officer	Presentation and position of Foetus	F. Heart	Maturity
7. General Condition ————Teeth	Breast & Nipples	Oedema	B.P.	Hb. Value
8. F . Examination :—			Urine	

Date of Examination and Certification	Initials of Medical Officer	Condition	Treatment/Remarks

(Reverse)

POST-NATAL MATERNITY REGISTER

Serial No. \_\_\_\_\_

Date of Confinement \_\_\_\_\_

Hb. percentage of Mother's blood \_\_\_\_\_

Name \_\_\_\_\_  
Infant Male/Female \_\_\_\_\_

Sirdar \_\_\_\_\_

Tear if any \_\_\_\_\_

Date of Examination and Certification	Initials of Medical Officer	MOTHER		INFANT		
		Condition	Treatment if any	Weight Lb. oz.	Condition	Treatment/ Remarks

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Ht. Value of Mother on discharge \_\_\_\_\_

Baby Vaccinated on \_\_\_\_\_