The control of tuberculosis in England, past and present / by G. Gregory Kayne.

Contributors

Kayne, G. Gregory 1901-1945.

Publication/Creation

London : Humphrey Milford, Oxford University Press, 1937.

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THE CONTROL OF TUBERCULOSIS IN ENGLAND

PAST AND PRESENT

G. GREGORY KAYNE

OXFORD MEDICAL PUBLICATIONS

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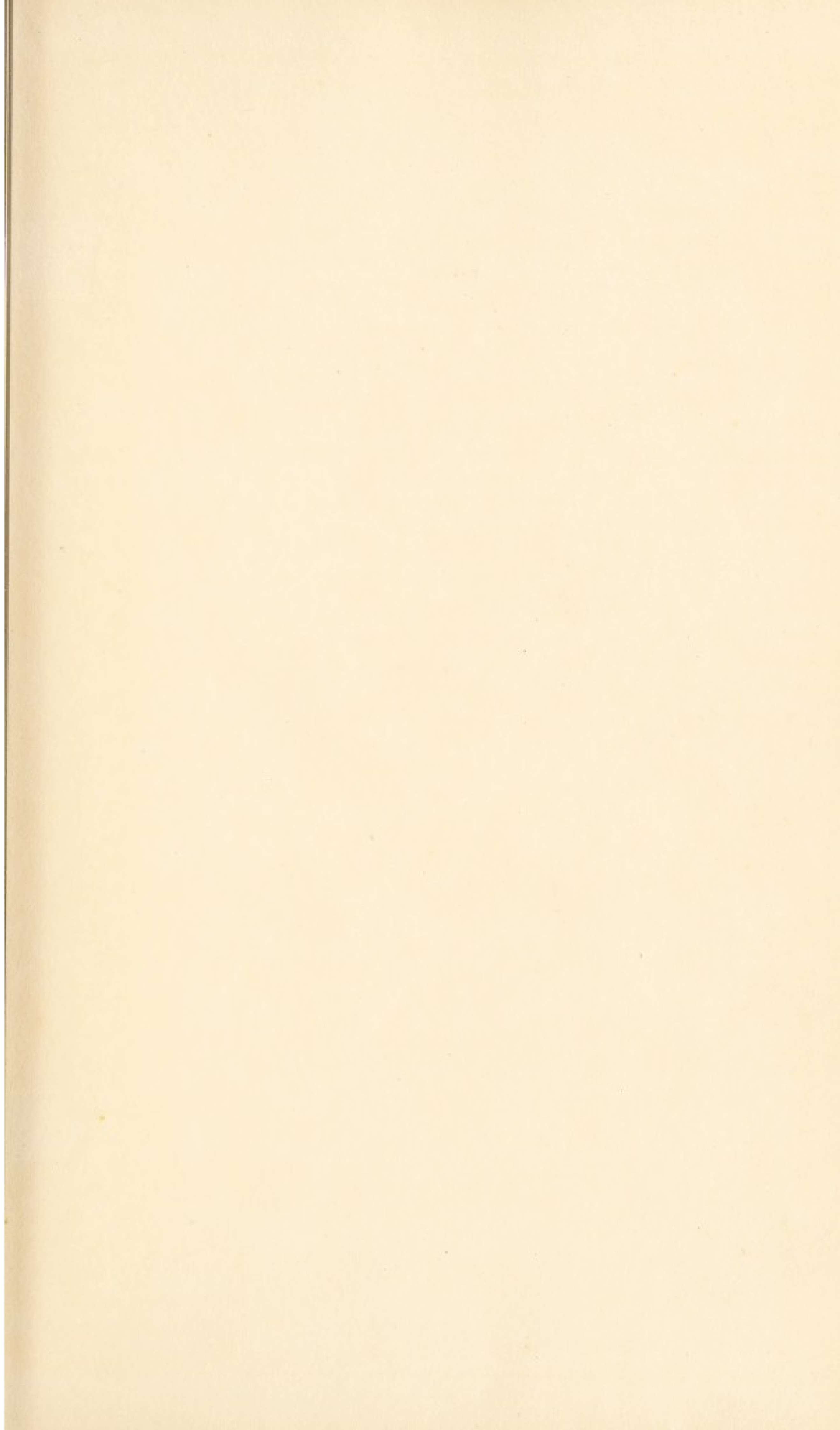

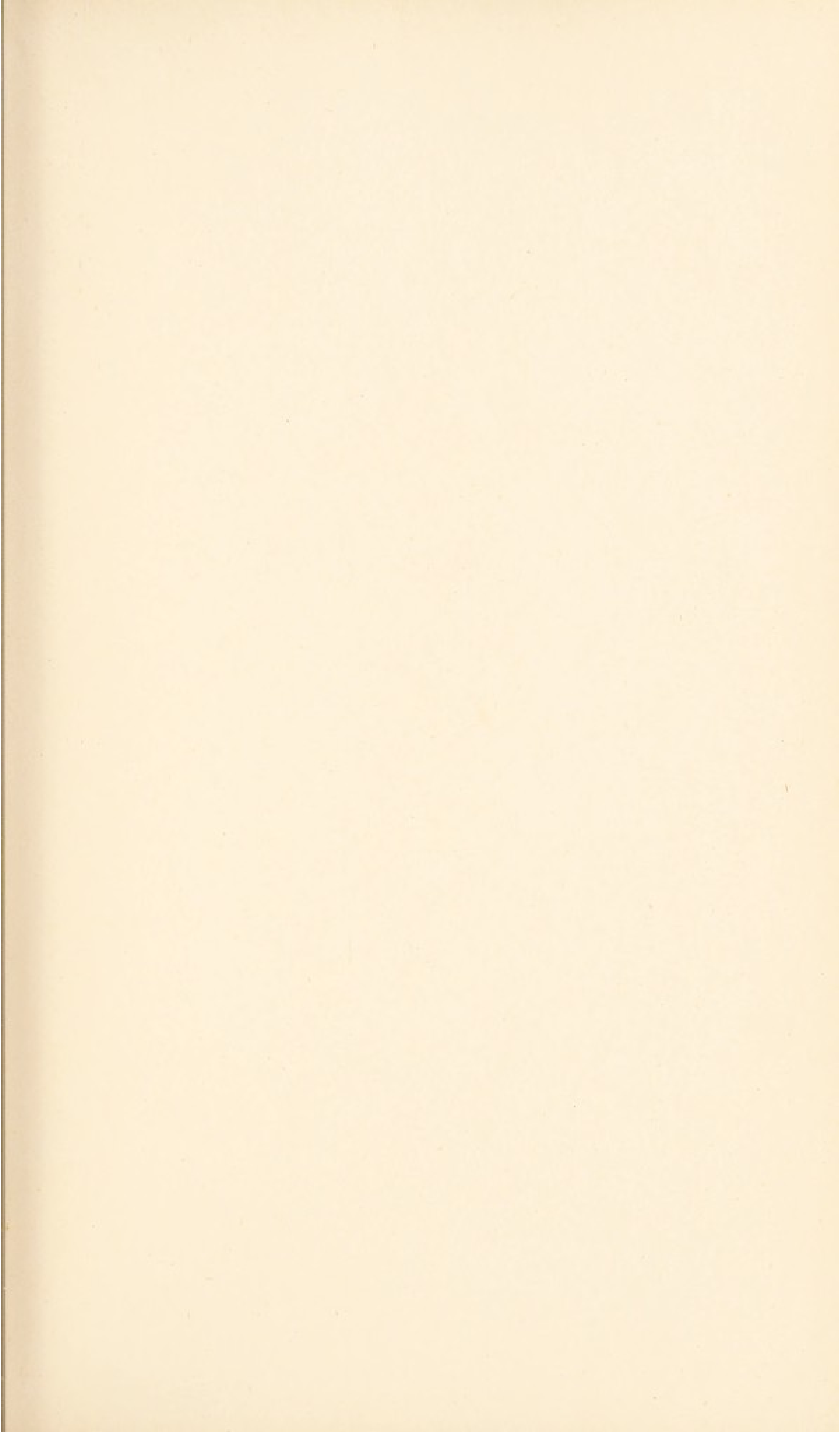

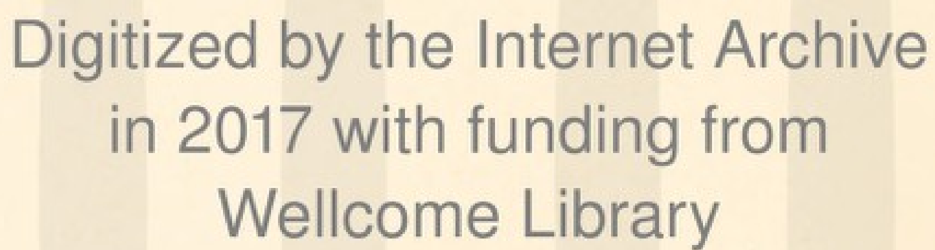
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OXFORD UNIVERSITY PRESS
AMEN HOUSE, E.C. 4
London Edinburgh Glasgow New York
Toronto Melbourne Capetown Bombay
Calcutta Madras
HUMPHREY MILFORD
PUBLISHER TO THE UNIVERSITY

OXFORD MEDICAL PUBLICATIONS

THE CONTROL OF TUBERCULOSIS IN ENGLAND

PAST AND PRESENT

BY

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FOR ENGLAND AND WALES;
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FELLOW IN TUBERCULOSIS, 1933–5

WITH FOREWORD BY

Sir HUMPHRY ROLLESTON, Bart.,
G.C.V.O., K.C.B.

'*The disease that still kills more than twice as many individuals as any other single cause of death during the most productive and enjoyable period of the life span can hardly be jubilantly regarded as being nearly conquered.*'

ARNOLD RICE RICH
(1936)

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LONDON : HUMPHREY MILFORD
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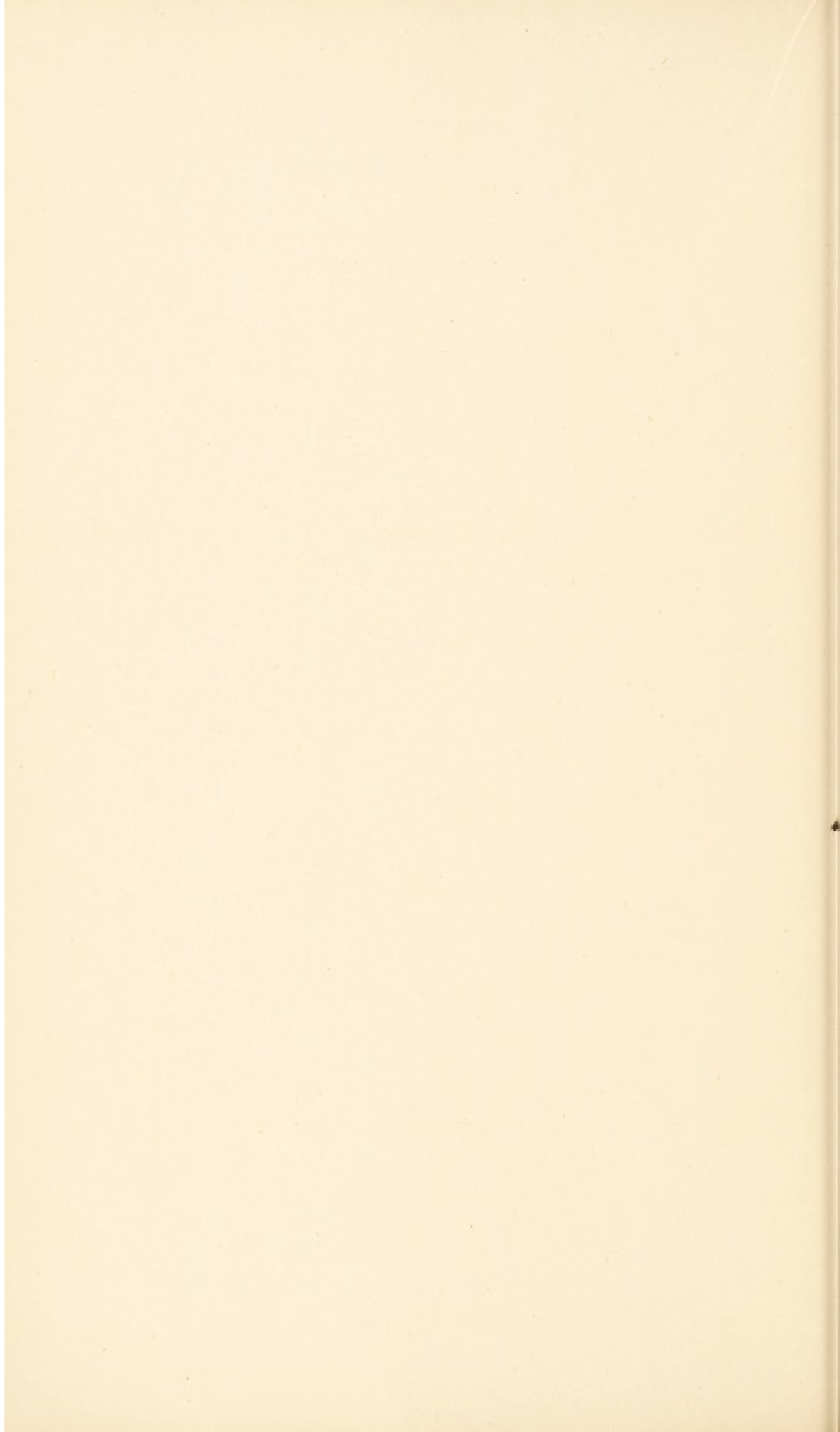

FOREWORD

This well-written book comprehensively and concisely covers the wide field of the prevention and control of tuberculosis, a disease which in the seventeenth century was called 'the captain of the men of death' by John Bunyan and has such influential social and economic bearings. The text, which contains many statistical tables, is divided into three parts, the first of which deals with the past history of the subject in this country up to 1908. This year was the milestone marking the intervention of the State in its official recognition of the importance of the disease by the Public Health Regulations (Tuberculosis); this made compulsory the notification of tuberculosis in patients in Poor-Law institutions and in those under the care of district medical officers. Voluntary notification of tuberculosis, however, long preceded this regulation; for example, it had been adopted in 1892 at Oldham. Attention is rightly directed to the stimulus given to the prevention of the disease in 1898 by the famous meeting, presided over by the Prince of Wales (later King Edward VII) at Marlborough House, and by the National Association for the Prevention of Tuberculosis founded then and there.

The second part traces in detail the progress of tuberculosis control since 1908, and shows the inhibitory influence of the war and the post-war economic crisis. The third part deals with the problems of tuberculosis in the poor, such as propaganda and education, the tuberculosis dispensary, after-care organizations, institutional treatment, and the village settlement scheme, originated by Sir Pendrill Varrier-Jones,

which is fully and impartially discussed. In the concluding section on the future, the author arrives at the logical conclusion that sooner or later the care of the national health will be undertaken by the State on the same footing as national defence and police supervision.

Dr. Gregory Kayne has done well to bring out this carefully considered review of a subject in which general practitioners are much concerned. Further it is obvious how well the author deserved and how thoroughly he must have utilized his tenure of the Dorothy Temple Cross fellowship in tuberculosis.

HUMPHRY ROLLESTON

INTRODUCTION

THE practice of medicine has undergone a remarkable transformation during the past century by its orientation to 'public health'. Concentration on the individual has been replaced by an attempt to preserve the health of the community as a whole. This change was prompted by sociological and economic considerations that could no longer be ignored by a State beginning to grow conscious of its duty in regard to the physical fitness of its citizens. The belief in wide biological truths rather than in an individual divine providence, and the increasing knowledge of causation of disease formed a scientific basis for this new conception.

It was inevitable that the practical application of this new conception should have dealt first with general measures rather than with problems presented by individual diseases. Thus, tuberculosis, in spite of the enormous toll it took in human life and suffering, did not specially engage the attention of the State until a few years before the Great War. The unavoidable general dislocation caused by the War occurred, therefore, at a time when the anti-tuberculosis organization had not yet been completed. The resulting stay in its development associated with the important changes in our knowledge of the disease and its treatment in the last twenty-five years must, therefore, be held partly responsible for any deficiencies that may be met in our present methods of control.

Tuberculosis is a disease in which social and economic factors play a very important role, and no tuberculosis worker, be he a medical officer of health, tuberculosis

officer, superintendent of a tuberculosis institution, or health visitor, can avoid coming into contact with these aspects of the disease. Some knowledge of the development of our present national scheme for the prevention and treatment of tuberculosis is, therefore, essential for an intelligent understanding of tuberculosis work, and for an accurate appreciation of the problems which tuberculosis control still presents to-day. This small book is an attempt to provide this knowledge in a succinct form, and it is hoped that its contents will be found useful not only to special workers in tuberculosis, but also to those interested in public health in its broader aspects. Moreover, as I hold the sincere conviction that the general practitioner should and can play a most important part in the eradication of this terrible disease, it is my earnest hope that the book may find a place on the table of many general practitioners who practise among the poorer classes of the population.

The book naturally deals chiefly with the treatment of the disease in the poorer classes, for tuberculosis has a pre-eminent claim to be called a disease of the poor. Many investigations have been carried out to show the relationship of poverty to tuberculosis. Sir Shirley Murphy's report to the L.C.C. in 1898 emphasized the obvious relation existing between overcrowding and the phthisis death-rate; Sir Hugh Beevor (1899) traced a connexion between the phthisis death-rate and the food supply; and Ewart (1922) and others have provided figures indicating the association of phthisis with wages. The difficulty has always been, however, to decide whether poverty is the predisposing cause of tuberculosis, or whether the ill health and loss of wage-earning capacity resulting from the disease

are directly responsible for the poverty. A careful statistical investigation carried out recently, under the aegis of the National Association for the Prevention of Tuberculosis, by Bradbury (1933) proved the correctness of the former alternative; although what particular component of 'poverty' is really responsible must still remain a matter for research.

But in discussing tuberculosis as a disease of the poor the net is cast wide. If the 'sick poor' are considered to include 'all those who are unable to make unassisted their own arrangements for their medical treatment', the protracted cause of tuberculosis and the proportionate loss of earning capacity involved add to this class many who, in regard to the treatment of more acute or less incapacitating diseases, would not require such assistance.

This book is divided into three sections. Apart from the historical interest which attaches to a knowledge of the treatment and prevention of tuberculosis in the past, a clear understanding of the present handling of the problem cannot be obtained without tracing the steps which have led to the establishing of order among chaos, and to the development of schemes of prevention and treatment covering the whole country. Indeed, less than fifty years ago no organized provision whatever existed for the treatment of a disease which was then responsible for over a tenth of the total deaths and was incapacitating very many more. The year 1908 is a landmark in this respect; for in that year the State officially recognized the importance of the disease and instigated its administrative control by issuing the Public Health (Tuberculosis) Regulations. These made compulsory the notification of persons suffering from phthisis in poor-law institutions, or

coming under the notice of district medical officers, to the appropriate medical officer of health. Other measures for the treatment and prevention of tuberculosis followed each other in rapid succession—except during the period of the Great War—and in 1921 all county and county borough councils were compelled to establish a complete scheme available to the whole community. Part I of the book will, therefore, deal with the disease and its control (such as there was) up to 1908. The steps which have led to the development of the existing administration of tuberculosis by the State will be traced in part II. Part III includes a full discussion of the problem as it presents itself to-day, and affords the opportunity of indicating shortcomings and examining possibilities of improvements in the future.

Finally, it is necessary to stress the fact that in discussing tuberculosis, treatment and prevention cannot be completely dissociated. The successful treatment of every consumptive results in some reduction of the human bacillary reservoir and, therefore, acts as a preventive measure to others. It has, however, been found useful to summarize briefly the preventive aspect of the subject in each part of the book.

My very sincere thanks are due to Mr. Home, Librarian to the Royal Society of Medicine, and his assistants, for much help with references; and to the Secretaries of the Royal Chest Hospital, the Hospital for Consumption, Brompton, and the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, for information concerning their respective institutions.

I should also like to express my gratitude to Mr. S. Cowan, B.A., for his kindness in reading through the proofs.

Note. The opinions expressed in this book do not necessarily represent those of the Middlesex County Council.

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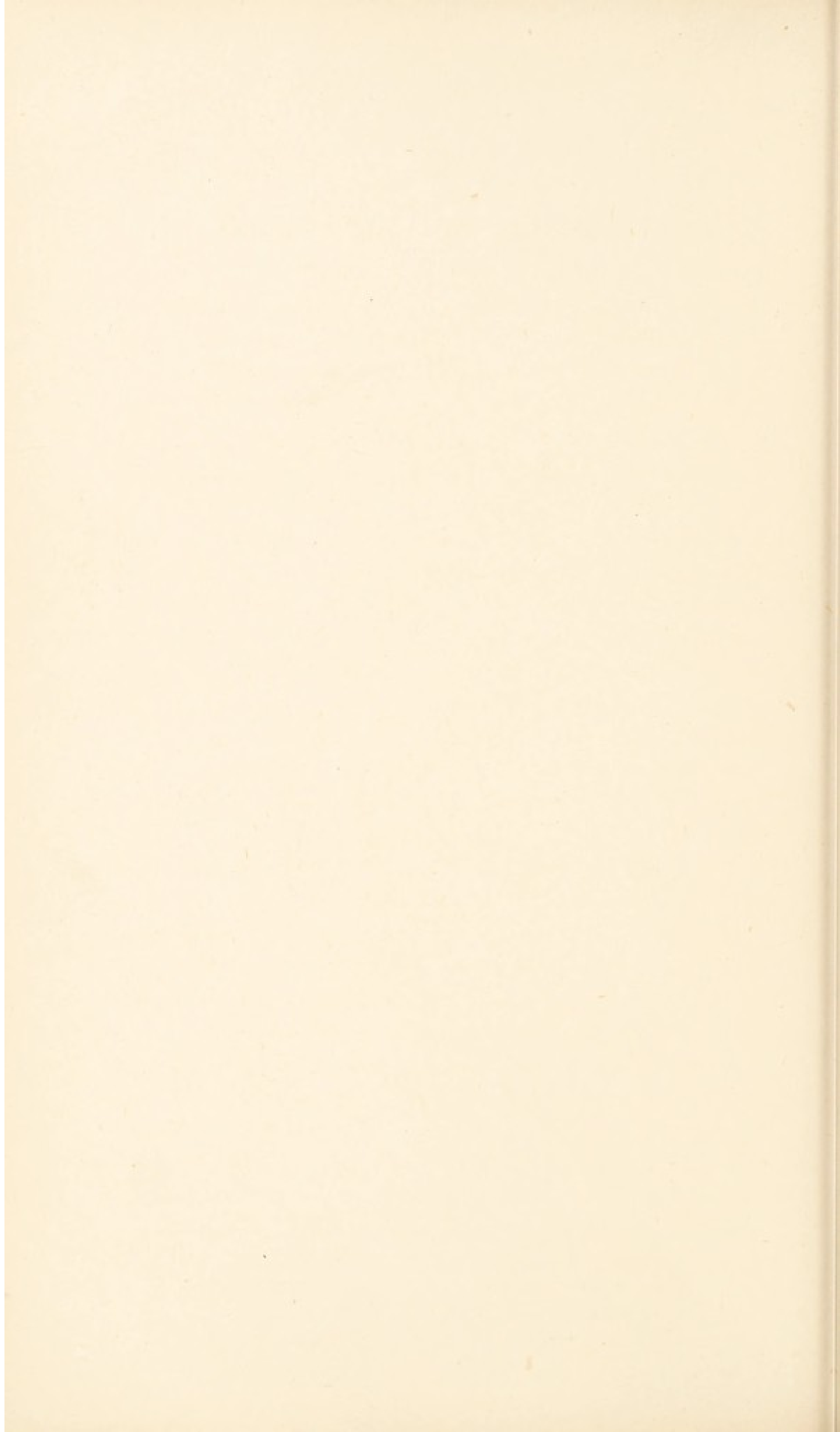
PART I

THE TREATMENT AND PREVENTION OF TUBERCULOSIS BEFORE 1908



I

INCIDENCE OF TUBERCULOSIS

In order to obtain a correct perspective of the control of the disease in the past, it is essential to have some knowledge of its incidence and the views that have been held on causation and treatment.

Even at present there are no trustworthy records of the numbers suffering from tuberculosis, so that the incidence of the disease is measured by the fatal cases. The latter criterion was, therefore, even more necessary before the disease was made notifiable. The first census of the population was taken in 1801, but reliable data of the death-rates from tuberculosis are available only since 1850; they are contained in the Registrar-General's reports. Records of deaths have, however, existed for a much longer period in the London Bills of Mortality, weekly returns of the number of deaths in a parish issued under the supervision of the company of parish clerks. Although there exists such a bill dated August 1535, their compilation may be said to have followed the establishing of parish registers by Thomas Cromwell in 1538 (*Encyclopaedia Britannica*), and began to be carried out in a recognized manner in December 1603 (the first year of the reign of James I). This was probably prompted by the occurrence of a severe epidemic of the plague, and was continued regularly until 1842, when, under the Births and Deaths Registration Act, 1836, the bills were superseded by the Registrar-General's returns. Not till 1728 was the age at death stated. At first only those who died of the plague were indicated separately; in 1629 the causes of death

were first classified, and 'consumption, tissick, and cold and cough' appear among them.

The accuracy with which the returns of causes were made left much to be desired. According to Graunt (1665):

'When any one dies, then, either by tolling, or ringing of a Bell, or by bespeaking of a Grave of the *Sexton*, the same is known to the *Searchers*, corresponding to the said Sexton.

'The *Searchers* hereupon (who are antient Matrons, sworn to their office) repair to the place, where the dead Corps lies, and by view of the same, and by other inquiries, they examine by what *Disease* or *Casualty* the Corps died. Hereupon they make their Report to the *Parish-Clerk*, and he every *Tuesday-*night, carries an *Accompt* of all the *Burials*, and *Christenings*, happening that week, to the *Clerk* of the *Hall*. . . .

'In many of these cases the *Searchers* are able to report the opinion of the *Physician*, who was with the Patient, as they receive the same from the Friends of the Defunct. . . .

'As for *Consumptions*, if the *Searchers* do but truly Report (as they may) whether the dead Corps was very lean, and worn away, it matters not to many of our purposes, whether the Disease were exactly the same, as *Physicians* define it in their Books.'

In 1754 an attempt was made to pass an act in Parliament so that

'all the parishes in England, should be obliged to keep exact registers of BIRTHS, BURIALS AND MARRIAGES, instead of christenings and burials only, as the bills are at present. And that from the several parish registers, an annual register should be formed in each county, and transmitted to the capital, early enough to be incorporated into one general bill' (Fothergill, 1768).

The proposal was apparently rejected because a member insisted that 'a clause for numbering the people of both sexes and all ages, before the act took place, be inserted'. In 1768 Fothergill, in a letter to the

Medical Society, again urged the adoption of the measure:

'Perhaps it will excite you the more readily to embark in this affair, when you recollect, that our country suffers much in the esteem of foreigners by a grievous neglect in composing the present bills of mortality. If you will please to cast an eye upon the article of consumption in the yearly bill, you will perceive, that in the present year, no less that 4,379 out of 23,639 are said to have died of this disease. From whence foreigners conclude, that the climate is so much disposed to produce consumptions, that it may justly be called unhealthy; a character it by no means deserves.'

He throws doubt on the accuracy of these bills:

'You know that these bills are framed from the reports of common searchers appointed to view the dead bodies, in order to prevent the concealment of violence. These searchers are for the most part, ignorant poor women, who, if they see the body emaciated, immediately enter it in their report as consumption. I need not inform you, how many chronic as well as long-continued acute diseases, in which the lungs are no otherwise affected than as suffering with all the other parts, waste the whole frame, and bring it to the same state as those who died tabid; but these ought not to be ranked under consumptions, but under the several heads to which they belong.'

Heberden (1801), on the other hand, believed the bills to be more or less accurate:

'People have fallen into two opposite errors concerning the Bills of Mortality. Some have considered their authority as too vague to be made the foundation of any certain conclusions; and others have built upon this foundation, without sufficiently considering its real defects. Both parties are equally in the wrong.

'The agreement of the Bills with each other, does alone carry with it a strong proof, that the numbers under the several articles are by no means set down at random; but must be taken from the uniform operation of some permanent

cause. While the gradual changes they exhibit in particular diseases, correspond to the alterations which in time are known to take place in the channels through which the great stream of mortality is constantly flowing.'

Willan (1801) endeavoured to obtain some confirmation of the accuracy of the bills of mortality by studying the incidence of consumption in his own practice. He writes:

'I formerly noticed the large proportion of deaths stated in the Bills of Mortality as arising from pulmonary complaints; and proposed to apply some test, in order to ascertain the correctness of this article. The only one I have to offer is the result of my own experience, by exhibiting a fair and exact account of all the fatal cases which have occurred during the last two years. However uncomfortable such a review may be to a physician, I have for once ventured to make it; and the following statement may be depended upon as precisely correct—Out of 4,500 persons admitted under my care, in the years 1795 and 1796, 246 died from the following disorders: of Pulmonary Consumption 77; Haemorrhage from the lungs 5; Peripneumony 1. . . . In the above account, the deaths from pulmonary complaints, exclusive of the Hooping cough and Measles, amount to one-third of the whole mortality; which affords a proof, that the proportion stated in the Bills of Mortality is not over-rated.'

He concludes:

'It must therefore be allowed that diseases of the lungs are more fatal in this place than any other species of disease; which is partly referrable to the variable state of our climate; but perhaps not less to our modes of living, and to the little attention paid in adapting the dress to the change of seasons.

'In my own list, the article of pulmonary Consumption includes cases of ulcerations of the lungs, and alterations of their texture, in consequence of pneumonic Inflammation and repeated Catarrhs. I apprehend not more than a fourth part of the whole number of cases put down could be referred to

proper Phthisis, arising from the slow and successive suppurations of tubercles in strumous constitutions.'

Woolcombe (1808) analysed the prevalence of diseases in the previous seven years at the Plymouth Public Dispensary. The relative occurrence of phthisis was one to 27; and an average of three years in his own practice showed a proportion of one to 29. He therefore concludes that it 'will too certainly appear that no exaggeration can be ascribed to that article in the bills of mortality'.

Brownlee (1918) has recently examined the mortality of phthisis since 1601 in the light of the bills of mortality and the work of the authors quoted. He states:

'My own view is that those who hold that the number of deaths ascribed to consumption gives a fair measure of the amount of phthisis, have formed an accurate opinion, an opinion which some other evidence to be given later confirms.'

The incidence of tuberculosis in the period under review can now be indicated. Up to the middle of the nineteenth century, figures for pulmonary tuberculosis alone are available. Moreover, as there were no accurate estimates of the population until 1801, only the ratios of the deaths from phthisis to total deaths can be obtained. By working out these ratios in London from 1601 to 1910, Brownlee (1918) found that they varied greatly and that the difference seemed much larger than could be accounted for by any causes of inaccuracy in compilation of the mortality figures. In 1660 phthisis accounted for 20 per cent. of the total deaths. This percentage fell more or less gradually to 12 in the year 1700. From then onwards there was a steady increase to a maximum of 26 per

cent. at the end of the century. After 1800 a drop again began, pulmonary tuberculosis representing 12 per cent. of the deaths in 1850 and 9 per cent. in 1910. Although these figures in themselves are not sufficient to indicate whether an increase or decrease in the tuberculosis mortality had occurred in the period reviewed here, Brownlee (1918), on other statistical evidence, expresses the belief that a long epidemic wave of phthisis had occurred, which reached a maximum in the early years of the nineteenth century; and he shows that it cannot be attributed to changes in the general death-rate. He states:

'As accurate populations do not exist prior to 1800 it has not been possible to show the course of the actual death-rates, but the proportionate mortality undoubtedly gives a result which is comparatively trustworthy. To my mind there is no doubt at all that the amount of phthisis in 1800 was very excessive, judged by present day standards . . . and the easiest explanation is that from the beginning of the 18th century to the beginning of the 19th century consumption increased in amount, and from the latter point steadily diminished. Though the increase in the proportionate mortality does not prove that the disease was increasing, or the decrease that it was decreasing, the probabilities that there was a large amount of phthisis in London in 1800 are very great. In the first period for which accurate statistics exist, namely that between 1840 and 1850, the amount of phthisis was about half of that I estimate for the earlier epoch, and from this point the decline is sufficiently well proven.'

From 1850 onwards more or less accurate figures of pulmonary and non-pulmonary tuberculosis deaths for sex and age are available. Records do, however, also exist from 1838, with the exception of the years 1843–6. It will be of interest to indicate the incidence at the beginning of this period and at the beginning

of the twentieth century and emphasize the changes which have occurred during these fifty years. The following figures (table I) are taken from Bulstrode (1908) and indicate the crude death-rate per 1,000,000 living, from phthisis, non-pulmonary tuberculosis, and diseases of the respiratory system.

TABLE 1. *Crude death-rates per 1,000,000 living*

	1858–60	*1901–5*
Phthisis	2,565	1,215·2
Other Tubercular and Scrofulous Diseases*	739	522·6
Diseases of the Respiratory System . .	3,265	2,475·8†

* Excluding Lupus † Excluding Croup

The fall in the death-rate of tuberculosis had thus occurred in both the pulmonary and non-pulmonary forms; it should be pointed out, however, that in the period under discussion the diagnosis in the pulmonary form was probably more to be relied on than in the non-pulmonary form. The decrease in phthisis began, and the incidence showed a higher rate of fall, prior to the belief in the communicability of the disease, to the introduction of the Public Health Act, 1875, and to the discovery of the tubercle bacillus by Koch in 1882, than it has done since. Table 2 gives the quinquennial death-rates from phthisis per 10,000 living with the number of deaths in the third year of each five-year period.

The fall in the mortality had occurred in both sexes and at all ages, although by no means at the same rate. Thus, while from 1851 to 1863 the greatest incidence of phthisis was in women, since 1868 the reverse happened, and in 1906 the mortality was greater in males by 4 deaths per 10,000; thus showing

TABLE. 2. *Quinquennial death-rates per 10,000 living*

Year	*Total deaths*	*Average annual death-rate per 10,000 living for each quinquennial period*
1840	59,923	38·8 (1838–42)
1853	54,918	28·0 (1851–55)
1858	50,442	26·0
1863	51,072	25·2
1868	51,423	24·4
1873	51,355	22·1
1878	52,856	20·4
1883	50,053	18·3
1888	44,248	16·3
1893	43,632	14·5
1898	41,835	13·2
1903	40,132	12·1 (1901–5)

that the tuberculosis death-rate among females had fallen at a more rapid rate than among males. Table 3 (MacNalty, 1932) indicates the mortality from phthisis at different ages in males and females per 10,000 living at each age.

TABLE 3. *Mortality from phthisis per 10,000 living at each age*

	MALES								
	10–15	*15–20*	*20–25*	*25–35*	*35–45*	*45–55*	*55–65*	*65–75*	*75 & over*
Decennium 1851–60	76	240	405	403	402	384	335	239	93
Year 1901	19	80	167	215	289	313	252	159	60
Decline %	75	67	59	47	28	19	25	33	35
	FEMALES								
Decennium 1851–60	129	352	430	458	419	313	239	164	72
Year 1901	40	100	129	164	186	149	112	83	31
Decline %	69	72	70	64	56	52	53	50	57

II

KNOWLEDGE OF CAUSATION AND TREATMENT OF TUBERCULOSIS

Causation

At the beginning of the nineteenth century the knowledge of the cause of tuberculosis was based, apart from mere conjecture, entirely on the correlation of symptoms with post-mortem findings in tuberculosis of the lungs. The relation of 'tubercles' to phthisis, or the common factor in the causation of pulmonary tuberculosis and tuberculosis of other organs, was not recognized until Laënnec's investigations were published (1819). In spite of his work the 'dualist' theory still prevailed in England for some time: i.e., that most of the lesions of tuberculosis are not due to the tubercles but are primarily inflammatory in origin, the tubercles being secondary to inflammatory changes—as Niemeyer expressed it: 'the greatest danger to which a phthisical patient is exposed is that of becoming tuberculous.' In 1908 Newsholme could still write that the belief in the separate origin of scrofula had only recently disappeared.

The disease was regarded by a few as infectious—thus Smollett in *The Expedition of Humphrey Clinker*, writing from a fashionable inland health-resort, says: 'You won't deny that many diseases are infectious; even the consumption itself is highly infectious.' The views generally held on the causation of tuberculosis, however, tended to considering the disease as non-infectious and, therefore, as a manifestation of a special constitution or diathesis. This applied even in regard to more acute diseases like cholera and influenza. The

Royal College of Physicians reported in 1854 (Newsholme, 1908) that 'the theory that cholera is propagated and diffused by means of human intercourse, receives no support from the facts relating to variations in the intensity of cholera epidemics, and the circumstances determining these variations', and cited the rapidity of the increase of cholera in a town as 'an additional reason for believing that the diffusion of cholera in a town is independent of contagion'. A joint inquiry made by the Provincial Medical Association of England into the contagiousness of influenza in the epidemic of 1836–7 led to answers 'of an almost uniform tenor, the opinion of nearly all those who have had the most extensive opportunities of investigating the disease, and the best means of arriving at a definite conclusion, being that there is no proof of the existence of any contagious principle by which it was propagated from one individual to another'. Sir John Simon in 1858 speaks of tuberculosis as hereditary: 'The tendency to tubercular disease is one which transmits itself from parent to child; and thus, if in any one generation the disease be artificially engendered or increased, that misfortune does not confine its consequences to the generation which first suffers them.'

The new conception brought forward by Laënnec of the 'unity' of tuberculosis was bound to lead, however, to investigations into the possibility of a contagious factor. To Villemin must be given the credit for establishing this theory on a scientific basis by his experiments on the transmission of the disease to rabbits and other animals (1865). Later it was shown that tuberculosis could be produced by eating meat containing tuberculous material. By his discovery of the tubercle bacillus in 1882 Koch provided

the missing link. Much work still remained to be done in the following few years. In 1889 the International Congress on Tuberculosis in Berlin was attended on behalf of the British Government by two representatives whose report contains conclusions on the causation of tuberculosis which almost hold good to-day, showing that 'the modern position in regard to prevention and cure had become crystallized in the minds of sanitarians, if not of legislators' (Harley Williams, 1932). They stated that

> 'Tuberculosis is said to be caused by the tubercle bacillus, which gains access through the lungs and throat. Other organisms might complicate the process. The most important vehicle of the germ is dried sputum, but milk, especially from tuberculous udders, and meat must also be remembered. The disease is rarely transmitted by any hereditary predisposition, and although the bacillus was always present, its activity depends on the resistance of the host.'

Then came Koch's famous statement at the British Congress of Tuberculosis in London in July 1901, a statement which startled the world. He considered that human tuberculosis differed from the bovine type, that it could not be transmitted to cattle, and, moreover, that transmission of bovine tuberculosis to man was a very rare occurrence; he did not deem it necessary, therefore, to take any precautions against infection by milk and the flesh of tuberculous cattle. Doubt was thrown upon this declaration, and the royal commission subsequently appointed, in their reports of 1904 and 1907, showed that both Koch's statements were untrue, and submitted the required experimental basis for our knowledge on this subject as it exists to-day.

Finally, mention must be made of the work of

Naegeli and von Behring; for their investigations at the beginning of this century, that is, at the end of the period under review here, introduced two new conceptions of fundamental importance. Naegeli's post-mortem studies (1901), showing the very large percentage of healed tuberculous lesions to be discovered in people dying of other causes, by their implication of the spontaneous cure of phthisis, introduced new hope for the successful treatment of a disease which had up to then been considered almost hopeless, as is seen in the following words of Laënnec (1819):

'It is now the general opinion of all those who are acquainted with the actual state of our knowledge respecting the pathology of diseases, that the tubercular affection, like cancer, is absolutely incurable, inasmuch as Nature's efforts towards effecting a cure are injurious, and those of art are useless.'

Von Behring's work (1903) and his theory that infection with the bacillus in childhood is followed by recrudescence of the lesions in adult life, led to the conception that tuberculous lesions might be latent, i.e., bacilli could exist in the body without giving rise to symptoms, a subject presenting problems unsolved even to this day.

Treatment

The scanty and erroneous knowledge of the cause of tuberculosis before the end of the nineteenth century is well reflected in the treatment of the disease during that period. Phthisis was dealt with in a variety of ways, but all had for their basis the prevalent general scheme of treatment for all diseases due to an 'inflammation'. Fothergill (1770) urges early treatment, and that the

'quantity of diet, especially solids, be lessened; let the

differences be made up with warm thin suppings; barley water, milk and water, thin gruel, the lightest broths. . . . If there be much heat or any pain in the breast, bleeding will be indispensably necessary. In respect of medicines the most demulcent and cooling are indicated.'

Again,

'The same indications point out a familiar process, in respect to cure. To withdraw as much nourishment as can be done, without the risk of suffering from inanition . . .; to bleed in small quantities repeatedly . . .'

In a later paper (1775) he discusses minutely the medicines to be used and praises the properties of Bristol water, recommending the sending of patients to Bristol. The climatic treatment is discussed at length:

'In consumptive cases, however, the air of all large cities is found by experience to be particularly injurious. . . . The vales, especially to the south-east and west of London, as Camberwell, Peckham, the lower parts of Clapham, the drier parts of Lambeth and Battersea, Fulham, Chelsea, Brumpton, and Kensington, and other sheltered dry places about the town would in the Spring undoubtedly be the most proper.'

He refers to the smoke of London, and discusses the properties of Buxton, Matlock, &c., and, for the more wealthy patients, the south of France, Italy, Portugal, and Madeira. Exercise is mentioned:

'The benefit of exercise in this temper has been strongly urged by many writers. . . . It is however evident, that this great auxiliary may be abused, and that consumptive patients may use it improperly.'

He summarizes thus:

'Permit me, however, to add, that to prevail upon the subjects of it, early to abstain from all animal food, and all spirituous and fermented liquors; to subsist entirely on milk, fruit, vegetables, and things prepared from them; to quit the

air of populous towns and large cities; to shun all occasions of anxiety, as well as fatiguing dissipation; to be regular in their hours, rising early, using immediately such exercise as is suited to their strength, and changing the air as far and as often as their convenience will permit; is to render them the most essential service in our power.'

This was a counsel of perfection that was not often followed; for Bodington (1840) refers to the treatment of phthisis as follows:

'One mode of treatment prevailing consists in shutting the patients up in a close room, to exclude as far as possible the access of the atmospheric air, thus forcing them to breathe over and over again the same foul air contaminated with the diseased effluvia of their own persons. . . . To aid the powers of the close room system, tartarized antimony is often given in excessive doses, and generally with the effect of nearly destroying the patient.'

He adds:

'I believe, having mentioned the shutting up plan in close rooms, the use of antimony and digitalis, if I add the use of demulcents, of blisters, leeches, plasters, etc., I shall have described the helpless and meagre system of treatment of consumption in general use at the present day, the utter uselessness of which is so well known and so obvious that members of the medical profession in the towns are in the habit of dismissing their patients to some distant seaport or watering-place, where, falling under precisely the same mode of treatment, they there commonly die.'

Evidently the need for some other method of treatment was felt. But the doctrine of fresh air and nutritious diet had to be preached at first to a non-receptive world by advocates who raised their voices in an unresponsive wilderness. The earliest record (Bulstrode, 1908) is that of a Scottish physician, the Rev. Andrew Stewart, M.D., parish minister of Erskine, who wrote

in 1749 from the Highlands to his friends in London, insisting that the most important factor in the treatment of consumption was fresh air and diet, and that medicine and climate, although of high value, should be considered as of secondary importance. Fresh air and diet were also stressed by Dr. William Buchan (1794). But it is George Bodington, of Sutton Coldfield, to whom the credit must be given for being the father of the sanatorium idea; he not only fully described it, but also carried it out in practice. His essay published in 1840 described his conception of abundance of fresh air and segregation of patients into a common building for purposes of treatment and supervision, and of a regime which was opposed to the 'antiphlogistic' treatment of the day. It contains advice and suggestions which are still practised at the present time, as the following quotations indicate.

'Farmers, shepherds, ploughmen, etc., are rarely liable to consumption, living constantly in the open air . . . the habits of these latter [i.e. inhabitants of towns] ought, in the treatment of the disease, to be made to resemble as much as possible those of the former class, as respects air and exercise, in order to effect a cure. . . . The only gas fit for the lungs is the pure atmosphere freely administered, without fear; its privation is the most constant and frequent cause of the progress of the disease. To live in and breathe freely the open air, without being deterred by the wind or weather, is one important and essential remedy in arresting its progress—one about which there appears to have generally prevailed a groundless alarm lest the consumptive patient should take cold.'

He urges the 'frequent supplies, in moderate quantities, of nourishing diet and wines . . .' and describes his own private institution:

'I have taken for the purpose a house in every respect

adapted, and near to my own residence, for the reception of patients of this class who may be desirous, or who are recommended, to remove from their homes for the benefit of change of air, etc. It is presumed that, as the situation is very superior in point of dryness, mildness, and purity of air, the advantages to be derived from systematic arrangements with regard to exercise, diet, and general treatment, with the watchfulness daily—nay, almost hourly—over the patient of a medical superintendent, great advantages may be obtained by the consumptive treated in this way, in comparison with those to be obtained by the removal of such a one to a boarding-house or hotel merely for change of scene.'

And is not the graduated exercise of more recent times to be seen in the following?: 'Therefore riding or carriage exercise should be employed for several hours daily, with intervals of walking as much as the strength will allow of, gradually increasing the length of the walk until it can be maintained easily several hours every day.' The advice which follows, although unfortunately still practised even now, will, however, not commend itself so easily: 'The cold is never too severe for the consumptive patient in this climate; the cooler the air which passes into the lungs, the greater will be the benefit the patient will derive.'

The poor were not forgotten:

'With respect to the consumptive poor patients, those who cannot afford to pay for a proper treatment of this sort, hospitals should be established in the vicinity of large towns, in fit situations and properly appointed in all respects for their reception and treatment. In these there should be provision made for affording them carriage or horse exercise; and gardening and farming occupations for the convalescent.'

Bodington's views were ridiculed. The *Lancet* published a sarcastic review of his book and referred to 'his very crude ideas and unsupported assertions . . . for

Bodington's theory of pulmonary consumption is altogether novel, and far above the range of our limited powers of comprehension. . . . But facts, with bold and vigorous intellects, are matters of little importance; the theory is "natural" and "rational", and hence the treatment which flows from it must be "successful". . . . More agreeable or seductive medicaments could not, certainly, be found in any pharmacopoeia; fresh morning air to make the patient breathe; good wine to down his pulse; a good dinner to make him fat, and an opium pill to make him sleep, are excellent remedies, if only they would have the desired effects.'

The reception of Bodington's views was such that soon after the publication of his essay, in 1843, he converted his institution into a private mental asylum, of which he took charge. In a private letter to his son in 1866 he wrote: 'I often think that, when I am dead and buried perhaps the profession will be more disposed to do me some justice than whilst I lived.' He died in 1882, several years before sanatorium treatment was established in this country, but his prophecy was fulfilled. The obituary notice in the *British Medical Journal* comments: 'He was severely handled by the reviewers and so discouraged from pursuing observations which might have been of the greatest value.'

Another British physician to stress the value of fresh air was Henry MacCormac. Indeed Sir Humphry Rolleston (1933) regards him as the second of 'the two pioneer protagonists of the open-air treatment of tuberculosis'. MacCormac (1855), who considered that 'Consumption is not communicated by any infection, any contagion, any more than a fractured limb is so communicated', states: 'For the first time in the history of the disease, I would proclaim that phthisis is absolutely within our control, ...'. He maintained that

'However indifferent or insubstantial the nourishment, whatever be the absence of cleanliness, the sufficiency or insufficiency of clothing, the climate, the amount of exercise, of sleeping, or of waking, if the abode be one in which the atmosphere is readily renewed, if the sun's rays play directly, if the house be airy, well lighted, and duly proportioned to the number of the occupants, scrofula will never visit it!'

In the treatment of phthisis he stressed the importance of open windows day and night, 'largely and freely open in summer, to a less extent in winter'. In addition, 'the phthisical sufferer should spend as much of his time in the open air as his strength and the weather will permit. This, his clothing being suitably adjusted, he should do in all seasons'. He reiterated his views with remarkable insistence, but apparently without effect on the medical profession, in several addresses read before medical societies in 1856, 1861, 1862, and 1864. These were collected and published (1865) in a second edition of his book on consumption already mentioned. Moreover, he stuck to his convictions so tenaciously that it was not unusual for him to enforce his directions about open windows by poking his umbrella through the windows of recalcitrant patients (Rolleston, 1933). The reception of his views may be illustrated by the remarks made by listeners to the paper read in 1861 before the Royal Medical and Chirurgical Society of London (*Lancet*, 1861, i, 434): one speaker considered the reading of the paper a waste of time; another stated that the Society should be protected from having to listen to such productions.

Henry MacCormac was born in Northern Ireland in 1800, and settled in Belfast, where he was appointed physician to the General Hospital. He died in that

town in 1886, four years after Koch's discovery of the tubercle bacillus. That he was not converted to the theory of the infective nature of the disease is shown by the title-page of the brochure *Etiology of Tubercle, with Comments on Doctor Kochs Bacilli* (1882), which contains the following;

> 'What is consumption, the bacillus,
> What is the bacillus, consumption,
> But what causes consumption, why the bacillus,
> And what causes the bacillus, consumption to be sure.—
>
> *q.e.d.*
>
> *Chorus of possible supporters of Dr. Koch.*'

Benjamin W. Richardson (1857) seemed also to have a clear conception of the sanatorium principle:

> 'If special hospitals are to be had, they should be as little colonies, situated far from the thickly populated abodes of men, and so arranged that each patient should have a distinct dwelling place for himself. They should be provided with pleasure grounds of great extent, in which the patients who could walk about should pass every possible hour in the day; and with glass covered walks overhead, where the open air could be freely breathed, even if rain were falling.'

Although the practice of fresh-air treatment may be said to have begun in England in 1791 with the erection of the Margate Infirmary, and was applied in the National Hospital for Consumption at Bournemouth (founded in 1855) and the Royal National Hospital, Ventnor (1869), it was abroad that sanatoria in the sense advocated by Bodington were first established. Hermann Brehmer, in the face of very powerful opposition, erected in 1854, in Silesia, the first small sanatorium in Germany, and another in 1859 at Görbersdorf in Upper Silesia, which later became the largest institution of its kind in the world. Brehmer,

moreover, believed in the need of high altitudes, as this would cause an increase in the size of the heart, considered to be of advantage in the cure of the disease. The building of other sanatoria in that country followed; and in 1892 the erection of the first institution of this kind for the poor was commenced, largely due to the influence of Dettweiler, first a patient and later an assistant of Brehmer. The number of these increased rapidly all over Germany owing to the introduction of insurance schemes for workmen. Dettweiler was also the first to realize the importance of rest and to introduce the 'rest cure' as part of the sanatorium treatment, for it was becoming clear that the factor of exercise had been too much stressed before.

The development of the sanatorium principle in England was much influenced by the Nordrach Colonie in the Black Forest, founded in 1888. Many English medical men themselves went to be treated there and learned the principle of 'open-air' treatment from Dr. Walther, the director. The first private sanatorium in this country was founded in 1898, and the first public one in the following year. From that date onwards their number rapidly increased, as will be shown later. Moreover, open-air treatment was also introduced in other institutions admitting consumptive patients.

The treatment was one which appealed to the popular interest and was associated with an enthusiasm and over-sanguine hopes which could not but lead to disappointment. It was soon realized that a short stay in a sanatorium could not be considered as a specific cure for phthisis in all its stages. The inquiry into sanatoria carried out on behalf of the Local Government Board by Dr. Bulstrode and pub-

lished in 1908 showed the importance of the selection of cases. The 'early case' was insisted on; and it was also shown that however good the 'immediate results', the 'after results' were far from satisfactory.

However, the end of the period under review in this section of the book has been reached. It is now possible to examine the measures which were available for treating the enormous number of tuberculous poor before 1908 in the light of the knowledge of the disease then existing.

THE TREATMENT OF TUBERCULOSIS

THE institutions available for this purpose may be classified thus:

Voluntary:

- General Hospitals;
- Special Hospitals and Institutions;
- Dispensaries.

Poor Law:

Sanitary Authorities.

And, in addition, towards the end of the nineteenth century:

Sanatoria:

- Voluntary;
- Poor Law;
- Sanitary Authorities.

Anti-Tuberculosis Dispensaries:

- Voluntary.

III

THE VOLUNTARY SYSTEM

General Hospitals

In the discussion on poor law later, it will be noted that no arrangements for the medical relief of the poor existed before the middle of the nineteenth century; only those already 'on relief' were admitted to the sick wards of workhouses. The first special hospital for diseases of the lungs was not founded till 1814. It was therefore inevitable before that time, and even later, in view of the stigma attaching to relief, that much treatment of tuberculosis should be undertaken by the voluntary general hospitals. The development of the voluntary hospital system has been concisely summarized by McCurrich (1929). At the beginning of the eighteenth century the only public institutions (that is, those erected or provided by public or private philanthropy, by the State, or local authorities or associations) for the reception and treatment of the sick poor were St. Bartholomew's and St. Thomas's Hospitals. In the provinces private charity was the sole alternative to parish relief. Apart from these hospitals there only existed St. Mary's Bethlem for lunatics and the two outhouses of St. Bartholomew's Hospital for 'foul diseases'. The foundation of Westminster Hospital in 1720, St. George's in 1733, and Guy's in 1766 followed. The first provincial hospital was apparently the Bristol Royal Infirmary (1735), the County Hospital in Winchester being founded in the following year; but others were soon established in the principal towns in England. In view of the relatively small number of beds and, therefore, the

long waiting lists, the period of admission for consumptives was much too short for such a chronic disease as tuberculosis. The method of recommendation by governor's letter and the fees charged also tended to reduce considerably the number of applications for admission. As the infectivity theory spread there was more and more reluctance on the part of these institutions to accept phthisical patients. Even in 1827 'from several hospitals patients of this description are expressly excluded' (13th annual report of the Royal Chest Hospital). The Brompton Hospital owes its foundation to the difficulty of a consumptive to secure admission to a general hospital. A clerk in the employment of a leading solicitor fell ill with consumption, and 'his employer endeavoured in vain to procure his admission into any of the existing general hospitals—not apparently because the disease was considered infectious, but because the number of acute diseases needing treatment rendered it impossible to sacrifice a bed for so chronic a disorder as pulmonary tuberculosis' (*The Brompton Hospital and Frimley Sanatorium*, 1925).

Special Hospitals

Bulstrode (1908) gives the following list of the more important special hospitals for tuberculous patients, existing in this country in the 'pre-sanatorium' period. The date of foundation is indicated.

Royal Sea-Bathing Hospital, Margate.	1791
Royal Hospital for Diseases of the Chest, City Road.	1814
Brompton Hospital for Consumption.	1841
Western Hospital for Incipient Consumption, Torquay.	1850
City of London Hospital for Diseases of the Chest, Victoria Park.	1851

National Hospital, Bournemouth.	1855
Mount Vernon Hospital for Consumption.	1860
Home for Consumptive Females, 57 & 58 Gloucester Place, Portman Square.	1863
Liverpool Hospital for Consumption.	1864
Royal National Hospital, Ventnor.	1867
Manchester Hospital for Consumption.	1875
St. Joseph's Hospital, Chiswick.	1875
St. Michael's Home, Axbridge.	1878
St. Catherine's Home, Ventnor.	1879
Hahnemann Home, Bournemouth.	1879
Eversfield Hospital.	1884
Manchester Sanatorium, Bowdon.	1885
Mildmay Convalescent Home, Torquay.	1886

It will be of interest to give a few details of the foundation and early years of the most important of these institutions.

The Royal Sea-Bathing Hospital, Margate.

This may be said to have been the first special hospital for the treatment of tuberculosis in this, or indeed in any, country. It was founded in 1791 by Dr. Lettsom 'for the relief of the poor whose diseases require sea-bathing'. Margate Infirmary, renamed the Royal Sea-Bathing Hospital in 1898, was intended primarily for London and secondarily for other parts of the country, and Margate was selected because of the reputation of the air and the accessibility to London by the Thames. Although later not exclusively devoted to patients suffering from tuberculosis, the institution was originally used for the various types of chronic tuberculosis known as 'scrofula'. Open-air treatment was in practice there almost from the beginning: 'not only to send out of doors all patients who could walk, but to place

in the open air, on beds and couches in the verandas and gardens, all who could endure the movement, and allow them to remain there for a considerable part of every fine day'. The number of beds was increased to 200 in 1881, but in 1892 140 beds had to be closed owing to shortage of money. In 1906 the beds numbered 162. Patients were admitted by letter of recommendation after approval by the Medical Board. In 1906 the weekly payment was 48*s.* and 32*s.* for 'ordinary' patients (according to age) and £6 for 'full-pay' patients. If a patient stayed for more than two months an additional letter had to be procured or an ordinary patient had to become a full-pay patient.

The Royal Chest Hospital.

This hospital was founded in 1814 as the Infirmary for Asthma, Consumption, and other Diseases of the Lungs, at Union Street, Bishopsgate. The earliest report available is the 13th (1827) and the 'Address' given at the beginning is quoted in full as showing not only the object with which the institution was founded, but also the light in which phthisis was regarded at that time.

'It is well known that Asthma and Consumption are the prevailing diseases of our northern climate. They are peculiarly distressing and fatal among the labouring class, because it possesses scanty means either of arresting their violence in the early stages, or of mitigating the agonies of body and of mind, which unavoidably accompany their progress and their termination. Yet singular as it may appear, amidst all the excellent charities which have been established by the public benevolence, no scheme had been adopted, by which the effect of a treatment, adapted in every respect to the nature of the complaints, might have a fair and persevering trial.

'It is not too much to affirm that the devastation of Asthma

and Consumption, though not so rapid and striking, is more extensive, and accompanied with greater pain and misery, than that of a pestilence. Would it be believed, or can it be reflected on, without the deepest concern, that in London and its environs alone, Ten thousand lives are the annual victims of these destroyers ? If the multitudes who are suffering and dying of these dreadful maladies during the winter season, were presented at one view before us amidst all the accumulation of wretchedness which bodily pain, aggravated by poverty and destruction, produces, the heart would grow sick, and we should eagerly desire to part with our substance, that we might procure relief from the agony of our own feelings. But, because the destroyer works unseen in the hovels of the indigent; because his victims, instead of being blazoned in the public journals, are confined to bills of mortality, the evil passes on with little observation; its magnitude and pressure remain almost unknown; no adequate exertion is made to resist its progress, or mitigate its effects; and the Physician is not furnished with the opportunity of trying on an extensive field, what medical research may do to alleviate suffering, and to save life. Must it not appear astonishing, that the public attention should not have been called sooner to an object of such magnitude? that whilst separate establishments have been provided for Fever, for Cancer, for Diseases of the Eye, for Small Pox, for almost every other malady: those disorders for which peculiar treatment and appropriate accommodation are most essential, should form an exception; and that too, although they alone destroy more lives than all the others united.

'In pulmonary complaints, one of the most effectual remedies, is, a timely removal to warm climates: but this remedy, very difficult even to the rich, is utterly unattainable by the labouring poor. The only substitute is artificial warmth, accompanied by medical superintendence, and such accommodations as the maladies require. That this substitute would frequently arrest the progress both of Consumption and Asthma in their incipient state, and greatly alleviate the symptoms of the latter, even when it appears in its most

advanced stages, is matter of experience. But how is it to be obtained and applied on such a scale as may be commensurate, in some degree, with the magnitude of the evil? From General Hospitals, patients of this description are expressly excluded; and in none is an opportunity furnished of procuring that artificial warmth which the nature of the complaints demand.

'To supply this deficiency in the existing Charitable institutions of the metropolis, the Infirmary for Diseases of the Lungs was established in the year 1814, the wards of which are kept day and night at a moderate summer temperature; and thus patients labouring under Asthma and Consumption are preserved from the inclemencies of the winter season, and are placed in a situation most favourable to their recovery. The benefits received by invalids at this Establishment, afford the most ample encouragement to its supporters, to persevere in their laudable exertions; and powerfully call upon the public at large, to assist in a charity capable of producing so much advantage to the community. If the consumptive and asthmatic alone, were its supporters, their number would be abundantly adequate to its prosperity.'

According to F. H. Ramadge (1861), who had been appointed physician to the hospital in 1820, the account given of the hospital in this 'address' was by no means an accurate description of the institution later. This is what he states (written between 1844 and 1846):

'If any corroborative evidence were wanting to substantiate the efficacy of my mode of treating consumption, it would be found in the fact of its having successfully triumphed over the disadvantages of the building *purposely* selected by the late Dr. T. Davies and his friends as the Infirmary for Diseases of the Chest.

'This building was situated in Artillery Street, Bishopsgate Street, in the midst of a very dense and confined neighbourhood. There was neither sewerage nor yard attached to it. What light the stairs received was from an air, or light-shaft from the basement floor to the roof, covered by a fixed

skylight; in consequence of which the external air was entirely excluded. There was at the base of the shaft a large cesspool which occupied nearly one-fourth of the area of the building, and two privies for the use of the patients. Hence the whole place was continually infested with the most noisome stenches and poisonous effluvia. It had no means of ventilation, except by the stairs, which did not exceed two feet and a half in width. The largest ward was only 26½ feet in length, by 13 in breadth, and 8 in height, and was made to contain seven patients. Such was the locality, and such the condition and structure of the building which was to represent, and become a substitute, for the cure of consumption, instead of the long-supposed salubrious island of Madeira.

'It would be out of place here to animadvert on the total want of judgment, or on the motives which could prompt men to select such a site for an Institution, under such circumstances as those just described, the object of which ought to be to afford the means of cure or relief for one of the most afflicting and important diseases incident to mankind, further than to observe that they indicated a total absence of all sympathy and feelings of humanity. And I may affirm, that if ingenuity itself had been set to work to contrive any one means more calculated than another to expedite the work of decay, it could scarcely adopt any mode more efficacious for that purpose, than to consign patients, affected with consumptive disease, to such a place.

'During my connexion with the Infirmary as Senior Physician, I unceasingly endeavoured to have these defects removed, and the inhuman abuses here pointed out, as far as possible, rectified. I repeatedly urged the individuals who had taken upon themselves the management of the Charity, to provide suitable and proper accommodation for the patients; but my remonstrances were either met with vague excuses, or compliance with my requests purposely, under some unfounded and unjustifiable pretence or other, postponed. In order to consummate this course of systematic atrocity towards the suffering, and imposture on the credulity of the public, a statement falsely designated "The Twenty-

ninth Annual Report" was issued, giving a glowing but deliberately untrue account of the state of the Institution. I advisedly say "*falsely* designated", as for several years no Committee Meetings had been held, nor any *credible* information given to the public respecting its management or condition.'

By 1827 the institution had admitted 33 in-patients and treated 9,240 out-patients. The yearly budget was about £500. The institution was administered, on the same lines as the general hospitals, by a president, vice-presidents, treasurer, house committee, and governors, and the income was mainly derived from the subscriptions of life (ten guineas) and annual (one guinea) governors, who had the privilege of giving letters of recommendation for treatment. (A guinea subscription provided for the treatment of one out-patient 'constantly attended', two guineas for one out-patient and one in-patient per year). There were attached to the institution two physicians, a surgeon-apothecary, a secretary, a collector, and a matron. The medical staff were chosen by balloting by the governors at large, 'Ladies, the Nobility, Members of Parliament, the President, Vice-Presidents, Medical Men and Governors passing through a turnpike-gate from their house to the place of election may vote by proxy'. In 1835 the hospital moved to Artillery Street, and in 1847, when it was known as the Royal Infirmary for Asthma, Consumption, and Diseases of the Lungs, to Dean Street, Finsbury Square. The admission of in-patients had ceased several years before this owing to the diminution in funds and the difficulty in obtaining a suitable building; and this no doubt contributed to the foundation of the Brompton Hospital in 1840. The system of recommendation was

apparently found to cause too much hardship, for in 1848 the committee recommended the continuance of the system 'for many years the peculiarity of this Charity', by which a 'certain number of patients are admitted without any recommendation, save that of the urgency of their symptoms'. They added that they also 'do not recommend the erection of a hospital for patients past all reasonable hopes of recovery—an asylum for incurables—but for those who, exhibiting the early symptoms of disease, may, by careful medical treatment and comforts adapted to their respective cases, be ultimately restored as useful members of society'. In 1850 the hospital moved to City Road, where it still stands; not till 1855 were in-patients again admitted, however. By 1864 the number of patients attending during the year had increased to 16,592 and the new cases numbered 2,074.

The Hospital for Consumption, Brompton.

Sir Philip Rose, Bart., the solicitor who could not secure the admission of his clerk with phthisis into a general hospital (see p. 25) did not let the grass grow under his feet. The state of affairs was brought to the notice of Queen Victoria by him and his friends, a committee was formed which raised funds by bazaars, &c., and the Hospital for Consumption was established in 1841 at the Manor House, Chelsea, for 20 patients. In 1844 the foundation-stone of a more commodious building was laid by the Prince Consort on the present site, and the hospital was completed in 1846 for 45 beds, later enlarged to 100 beds. The ventilation of the hospital was by a forced supply of air, which was held to provide 'for the poor a climate nearly approaching that of southern latitudes, the advantages of which

can only be enjoyed by the more favoured portion of the community'. Extensions were built in 1854 and 1879 (it now has 326 beds). Admission of patients was also by subscriber's letter which entitled to three months' treatment; urgent cases were, however, admitted on the recommendation of the medical staff alone. In the first year of its existence 888 in-patients and 10,051 out-patients were treated. A sanatorium associated with the hospital was founded at Frimley in 1904.

City of London Hospital for Diseases of the Chest.

This is described as beginning with the meeting of 'several gentlemen' on the 13th March, 1848, at the London Tavern. At that time the Brompton Hospital, founded six years before, was too far away and too young to be of much help to the City and the east of London, and the hospital in City Road too small to extend its help to the whole of the vast and rapidly growing population of the east and north-east of London. At this first meeting, 'the facts stated having excited much attention, a sub-committee was appointed to prepare a prospectus for general circulation, and to mature the plan of the proposed Institution'; the 'Institution being intended to afford the same advantages' to the east and north 'which the Consumption Hospital at Brompton confers on the Western portion of the Metropolis'.

A month later a committee of 19 was appointed of whom 13 were Quakers. The last fact probably accounts for the rule that the hospital 'be established upon the fundamental laws of charity to all mankind, giving equal rights and privileges to all, without distinction of religion'. No. 6, Liverpool Street was rented

as a City dispensary. From June to December 1848, 2,355 patients were treated, and the numbers so increased that at the end of the year nearly half the applicants had to be refused attention. The daily attendances amounted to over 100, and it was found necessary to apply the rule of recommendation by subscriber's letter; but the discretion for treatment without this was left to the medical officers. This procedure reduced the numbers to 2,500 in 1849—Brompton having an attendance of 2,800 at that time.

In 1849 a site was found for a hospital near Victoria Park and the wards were opened in 1855 for 40 patients only, although it had been designed with accommodation for 80, which became available later. In 1857 a resident medical officer was appointed, and by 1862, 9,074 out-patients and 442 in-patients had been treated. Further wings were added in 1865 and 1881, making a total of 164 beds.

In 1855 a rule was made that 'the hospital being established for the treatment of persons labouring under all forms of affection of the Lungs and Heart, to prevent its becoming a refuge for the incurable, rather an Hospital for the treatment of those admitting of relief, the number of consumptive patients in the wards shall at no time occupy more than half of the number of beds'. A letter of recommendation entitled to two months' treatment only. In 1860 the committee received 'a notification from the workmen employed in a large establishment not far from the Hospital, of their intention to subscribe a portion of their wages weekly towards the maintenance of the institution; and they cannot but regard this as a conclusive and gratifying proof that the benefits conferred by

the Hospital in the working classes are fully and gratefully appreciated by them'. By 1867 the hospital had a staff of 5 physicians and 7 assistant physicians; 4,549 out-patients and 641 in-patients had been treated.

Finally, it is to be noted that, as in other hospitals, treatment was not confined to patients from London districts. Thus in 1851 37 patients came from Kent and Surrey combined, 26 from Middlesex, Berkshire, and Bedfordshire, 17 from Norfolk, Essex, Herts, and Wilts, and 4 from Liverpool, Belfast, and Wales. In 1857, after the opening of wards for in-patients, there were admitted into them 5 from Surrey, 15 from Kent, 6 from Essex, 5 from Herts, 2 from Cambridge, 1 from Norfolk, 1 from Bedfordshire, 2 from Bucks, and 1 from Derbyshire.

National Hospital for Consumption, Bournemouth.

This was the first institution of its kind established in this country (1855). Its object was 'to afford a temporary asylum for patients in humble circumstances afflicted with chest disease who, being convalescent, may yet require further medical treatment and change of air to establish their health; or who are labouring under such an incipient form of disease as to have reasonable hope of obtaining benefit from a temporary residence in a dry and salubrious climate'. There were wooded grounds attached. In 1905 the institution had accommodation for 85 male and female patients. A number of beds were free, but the majority of patients paid 7*s.* 6*d.* a week. Admission was by governor's recommendation and a medical certificate, and patients from all over the country were eligible.

Dispensaries

The first free dispensary was established in London in Warwick Lane in 1688. More free dispensaries were founded in the eighteenth century, but the majority not till the nineteenth. Many of them were founded as, or became, provident dispensaries. Later still, several dispensaries were established by boards of guardians in connexion with medical out-relief. A certain amount of 'treatment' of tuberculous patients was undoubtedly carried out in them as well as in the out-patient departments of the general hospitals, and the work probably approximated more and more to that of a true tuberculosis dispensary at the end of the nineteenth century. The pioneer of the tuberculosis dispensary movement as it is known to-day was Dr. (now Sir) Robert Philip, who established the first institution of this kind in the world in Edinburgh in 1887.

IV

THE POOR LAW

THE monastic orders in this country maintained a vast system of social relief, having hospitals and asylums and giving alms to the poor. The dissolution of the monasteries by Henry VIII therefore created a social problem, and was responsible for the passing of the first English Poor Law Acts of Elizabeth in 1597 and 1601: compulsory assessment upon property was made by each parish for the relief of the poor, and unpaid overseers, under the orders of the magistrates, were appointed to give the poor work to do, to apprentice their children as they came of age, and to 'raise . . . competent sums of money for the necessary relief of the lame, impotent, old, blind and such other among them being poor and not able to work' (Prothero, 1913). The poor-rates, however, almost became an indirect subsidy to wages when the system grew up of leasing the services of paupers to farmers and employers. By an Act in 1722 workhouses were established, and paupers who refused to live in them were refused outdoor relief. This 'workhouse test' was abolished in 1795, and was replaced by a measure which caused even greater hardship: relief based upon the price of the loaf of bread was given in the pauper's home. The Napoleonic wars were responsible for much distress in this country and the expenditure on poor law rose tremendously, amounting to nearly eight million pounds annually in 1832.

The alarm caused by this increase in expenditure and the prospect of a rapidly multiplying population led to the appointment of a commission to inquire

into the poor law and, later, to the passing of the Poor Law Amendment Act in 1834: well-regulated workhouses were to replace all forms of outdoor relief. It was hoped by this simple but repressive principle, and by rendering the institutions as uninviting as possible, to reduce the number of applicants for relief and 'encourage self-help'. (This principle, it may be added, persisted throughout the reign of Queen Victoria.) The Poor Law Commission of three commissioners, followed by the Poor Law Board in 1847 (consisting merely of *ex-officio* persons), was appointed and made responsible for the administration of the poor laws: 'unions' among various parishes were formed[1], and the salaries of the medical officers appointed by many parishes to look after the sick poor were raised. Later boards of guardians were formed; the members were unpaid and subject to a property qualification which was not removed till 1894.

Medical Relief

The poor law was hardly concerned with medical relief during the first two centuries of its existence—not indeed until Chadwick (who had acted as secretary to the Poor Law Commission, and later became a full commissioner) realizing the close connexion between financial and medical relief, wrote to Lord John Russell and pointed out that increased expenditure was necessary 'to prevent circumstances which, by causing epidemics, threw a burden upon the poor-rates'. This resulted in the appointment of royal commissions to inquire into the causes of ill health among the labour-

[1] The first attempt to enlarge the local administrative unit—there were over 15,000 separate authorities administering relief; this was gradually reduced to 643 in 1909.

ing classes, and the reports of 1842 and 1844–5 led to the passing of the Public Health Act, 1848 (the first Act containing the term 'public health') which established the short-lived General Board of Health. It also made the boards of guardians in each union, as created by the Poor Law Act 1834, local authorities whose duty was to search out nuisances and report them to magistrates.

But to return to the curative aspect of the problem: the Act of 1601 provided for the 'necessary relief' of the 'impotent', but contained no other provision for a system of medical relief, nor was it referred to in any subsequent Acts down to that of 1834. The latter does not mention it specifically, but presumably left it to be established by the Commissioners; a section of the Act continued the power of the justices to order medical relief in exceptional cases: sudden or dangerous illness. The Poor Law Amendment Act of 1848 provided for medical or other assistance on account of 'accident, bodily casualty or sudden illness', and that of 1851 enabled the guardians to subscribe to 'any public hospital or infirmary for the reception of the sick' (McCurrich, 1929).

Sick wards did apparently exist in the workhouses, but they were intended only for inmates who fell ill; sick people were not sent to these wards from outside. Attention was concentrated on outdoor medical relief, and under the Act of 1834 the Poor Law Commissioners set up a system of district medical officers. The guardians contracted with the doctors to visit the sick in their homes, if necessary, and see others at the doctors' own house or surgery, providing the necessary medicaments out of the pay they received from the guardians. The giving of medicine was,

however, replaced in many districts by a system of dispensaries in 1867.

In 1865 the *Lancet* published the findings of an inquiry made by a commission appointed by them. The title of the annotation on the subject (*Lancet*, 1865, ii. 71)—'Our Workhouse Infirmaries: A National Scandal'—speaks for itself. The sick wards of the workhouses must by that time have developed to a large extent; in London there were 3,783 beds in 18 voluntary hospitals, and in the workhouses 7,643 for 'sick' and 'nominally' 7,000 for 'infirm'. They state:

'these infirmaries are in the largest great public hospitals; but they are administered with a total ignorance of that which constitutes good management in an hospital, and that which is necessary for the proper treatment and speedy recovery of hospital patients. . . . The sole medical officer, in addition to the cares of his private practice, has to perform unaided the whole medical service of about 340 sick patients, besides an equal total number of imbeciles and infirm.'

The *Lancet* attributed this appalling state of affairs in many cases merely to ignorance on the part of the guardians; but 'defects of administration were often shocking and inhumane'. Dr. Joseph Rogers played an important role in initiating the improvements which were instituted in the next few years[1], suffering dismissal from the Strand Board and suspension from that of Westminster for his pains. The *Lancet* inquiry was followed by a report made by the metropolitan inspector of the Poor Law Board, who confirmed their findings as to the ill construction of sick wards, the bad bedding, unclean eating-vessels, inadequate

[1] As fully described in his memoirs published by his brother (Th. Rogers, 1889).

medical and very bad nursing attendance. The nursing was, in fact, carried out by persons chosen from the pauper inmates, and were people who generally could not even read or write and were often intemperate. Trained nurses were first introduced into a poor law infirmary in 1865 owing to the influence of Florence Nightingale. Agnes Jones with 12 nurses and 18 probationers took charge of the nursing of the male wards at Brownlow Hill, Liverpool, and 54 paupers were liberated from that service. (In 1878 the Local Government Board reported that in all sick asylums and separate infirmaries pauper attendants had been superseded by nurses. In 1897 the employment of the former was forbidden. Thus, while in 1866 there were only 111 paid nurses in the whole of the metropolitan workhouses, in 1901 there were 1,246 trained nurses in the metropolitan workhouses and infirmaries and 1,924 in the provincial ones.)

The state of affairs thus exposed could no longer be tolerated. The Metropolitan Poor Law Act, 1867, gave power to combine the parishes and unions of the metropolis into districts and to provide asylums 'for the reception and relief of the Sick Poor', and the Metropolitan Asylums Board was established to provide treatment for the insane, and for fever and smallpox cases hitherto dealt with in workhouses. A number of metropolitan unions and parishes were also grouped together and formed into 'sick asylum districts' with a view to providing separate infirmaries for the non-infectious sick. Within a year six such 'districts' had been formed and seventeen unions had been asked to provide infirmaries on sites detached from the workhouses. By 1884 sick poor could be accommodated in up-to-date hospitals each with a resident medical

superintendent and well-qualified resident medical officers, and equipped to do surgical work.

The Poor Law Amendment Act of 1867 extended the principle of separate infirmaries to the provinces, and the reaction soon led to a tendency on the part of guardians to swing over to extravagance. It was said (Poor Law Commission Report, 1909) that there was a danger of the infirmaries being regarded as State hospitals into which all the sick of the country might be received for medical treatment and care!

The progress in the development of these institutions has been continuous ever since, though even a few years ago considerable differences in the building, technical equipment, staffing, &c., were to be found between one infirmary and another, varying no doubt with the views, knowledge and character of the members of the boards of guardians.

The changes in the poor law brought about in 1929 will be discussed in part II of this book.

Tuberculosis

Up to the middle of the nineteenth century, the consumptive pauper was presumably cared for medically only if the disease was detected whilst he was an inmate of a workhouse, when he was transferred to the sick wards. There he mingled with other patients suffering from acute contagious or non-infectious diseases; there was no attempt at separation. In the second half of the century the building of separate infirmaries led to isolation of the acute infectious diseases in separate buildings. Phthisical patients were still treated in the general wards; but the number of beds available was increased, and patients could be sent in from outside provided they were on relief.

Newsholme (1908) considered that since 1860 'a vast increase in the extent of segregation of tuberculous patients in workhouses and infirmaries took place'. In 1863–5 nearly a fifth of the deaths in the Clerkenwell, St. Luke's, St. Marylebone, Kensington, St. Giles's, and St. George's Bloomsbury, Infirmaries was due to phthisis (*Lancet*, 1865, ii. 14). The following figures are also instructive as indicating both the association of poverty with tuberculosis and the large and increasing extent to which phthisis was being treated in poor law institutions towards the end of the nineteenth century. Of the total deaths from phthisis in London which occurred in institutions, 31·4 per cent. in 1889 and 33·5 per cent. in 1904 occurred in workhouses, workhouse infirmaries, and sick asylums. In Sheffield this proportion was 6·3 per cent. in 1876–80 and 26·1 per cent. in 1901–5; in Salford 14·4 per cent. in 1884–90 and 27·6 per cent. in 1901–4; and in Brighton 9·6 per cent. in 1866–70 and 20·2 per cent. in 1901–4 (Newsholme, 1908). (In addition, fairly large numbers died of tuberculosis in lunatic asylums.) According to Toogood (1908), on July 7, 1900, there were 1,290 persons of all ages suffering from pulmonary tuberculosis (895 males, 365 females, and 39 children) and 257 from non-pulmonary tuberculosis in the Metropolitan infirmaries and workhouses. In 1905 the pulmonary cases had increased to 1,933, 1,471 being males. About 4,000 cases of consumption were being admitted, and about 2,500 deaths occurred, annually, during that period in these institutions.

At the beginning of this century the new conception that phthisis was infectious, and the open-air principle, led to the establishing of special wards or

institutions for the treatment of pulmonary tuberculosis, and even to the building of sanatoria. According to Newsholme (1908), in 1906, in 12 out of 27 metropolitan infirmaries consumptives were treated wholly in the same wards as other patients, but in nine they were treated entirely in separate wards; out of 85 provincial infirmaries 23 treated consumptives wholly and 13 partially in separate wards. The more common practice was therefore still to treat them in the general wards. The length of stay varied considerably. In Kensington the average stay of consumptives was 144 days in 1898 and 95 in 1902; in 1904 it was 311 days in Sheffield and 221 in Brighton.

The Liverpool Board of Guardians opened the Heswall Sanatorium on the Dee in 1902 with accommodation for 12 patients of each sex. Each patient had 1,000 cubic feet of space indoors. There were heather-covered grounds with a shelter at some distance from the sanatorium building. Day rooms were provided. In 1903 the Bradford Board of Guardians opened a sanatorium at Skipton with accommodation for 52 patients.

In a few instances the boards of guardians had secured the use of beds for their tuberculous sick at one or other of the sanatoria existing at that time (see below) by section 4 of the Poor Law Amendment Act, 1851.

The method of admission under the poor law resulted necessarily in quite inadequate treatment of the tuberculous poor. Newsholme (1908) summarizes the position in 1906 as follows:

'It must be noted, however, that when a patient becomes ill enough to be a pauper, he is usually suffering from well-established or advanced disease, and that the chief medical

function of the Board of Guardians under present arrangements is the treatment of patients who are so ill as to be completely unable to work. While infirmary treatment involves the stigma of pauperism, far more patients will struggle against the disease till they are past recovery, in the hope of avoiding the workhouse, than will apply for infirmary treatment at a stage at which it can have a fair chance of producing recovery, and before they have sown widespread infection in their environment. Boards of Guardians have accommodation and arrangements for treatment without being able to secure the patients at the most favourable time; the sanitary authority can secure the patient, but seldom or never has the accommodation and arrangements for treating them.'

I must now, therefore, pass on to consider what the sanitary authorities were doing for the tuberculous poor at that time.

V

SANITARY AUTHORITIES

The Public Health Act, 1875, is 'the basis of ordered local government in health matters'. The report of a commission appointed under Gladstone resulted in the creation of the Local Government Board in 1871. The Public Health Act, 1872, established a complete system of health authorities all over the country independent of the poor law. This was contrary to the recommendations of the commission, who had advised the creation of a *single* health authority for each district and a central department which would supervise both the poor law and health matters; they recommended that the poor law district medical officer should become the medical officer of health of the same district. However, the Act of 1872 created a district public health service. The Act of 1875 introduced a fundamental change. Hitherto the local authority for health had been the board of guardians; now the whole country was to be divided into urban and rural sanitary districts. Outside the boroughs the poor law unions were to be the administrative units, but were termed rural districts. The appointment of a medical officer of health was made compulsory in all districts. By section 130 the Local Government Board was given wide general powers to make regulations for the treatment of persons affected with cholera or any other epidemic, endemic, or infectious disease. By section 131 the sanitary authorities could provide hospitals for the reception of the sick and could contract or make arrangements for that purpose. This section did not restrict the power to hospitals

for infectious diseases, as was done later by an Act in 1893.

In the Local Government Act of 1888 was laid the foundation-stone of the modern public health authority, responsible for a wide area and conducting services on a large scale; for it created the county councils, who had the option of appointing a medical officer of health. Their power was supervisory over districts excluding the county boroughs. The metropolitan borough councils were not created till eleven years later (Local Government Act, 1899). The county councils were given powers, similar to those quoted above, in regard to hospitals by the Isolation Hospitals Acts of 1893 and 1901. Under the former enactment a 'hospital district' might be constituted by the county council and for this district a 'hospital committee' appointed to provide hospital accommodation for 'patients suffering from infectious disease'. Up to that time 'infectious disease' implied one or more of the diseases specified under the Infectious Disease (Notification) Act, 1889. But by section 26 of the Isolation Hospitals Act, 1893, this term might be applied by the county council, with the consent of the Local Government Board, to other diseases. By section 3 of the Isolation Hospitals Act, 1901, the hospital committee could enter into agreement with local authorities for the isolation of persons suffering from pulmonary tuberculosis, and by sections 21 and 22 of the Isolation Hospitals Act, 1903, the county council could contribute to the expenses of such accommodation. Finally, by section 2 of the 1901 Act, this power was held to include any hospital provided by any local authority for the reception of persons suffering from infectious

disease, whether within the area of the county council or not.

Thus, by 1901, the county councils had the power to erect or purchase sanatoria, contribute to the maintenance of patients in such institutions, and, within limits, combine sanitary authorities compulsorily for the purpose of providing sanatoria.

Tuberculosis

What use had been made by local authorities and county councils of these powers for treating tuberculosis by the end of the period discussed in this section of the book? In 1906 Manchester, Bristol, Leeds, Nottingham, Plymouth, Bath, Sunderland, Gateshead, Reading, and Kendal Corporations were making annual contributions to certain already established sanatoria; Bristol Corporation and the Highworth and Cirencester Rural District Councils had borrowed money to become part proprietors of the Winsley Sanatorium; Birmingham had obtained the sanction of the Local Government Board to borrow £17,000 to purchase a sanatorium site near Cheltenham; and Sheffield was converting an existing building into an institution 'for the education of consumptive persons in a preventive sense, and for selection of suitable cases for sanatorium treatment'. That was all in regard to local authorities. County councils had by then apparently hardly made use of their powers in this connexion. Bulstrode (1908) explains this as due to some extent to misconceptions and apprehensions which existed with reference to declaring pulmonary tuberculosis an 'infectious disease': the patients would be regarded as social lepers and the authorities might be legally bound to retain them till they became non-infectious.

This was due to a confusion between declaring the disease infectious for these purposes and making it 'notifiable'. Nevertheless, by 1906 Devonshire and Cheshire had added pulmonary tuberculosis to the list of infectious diseases, but no provisions in regard to its treatment had yet been made. Finally, it may be added that in a few towns (Manchester, Brighton, Sheffield, St. Helens, Leicester, Lewes, Northampton, &c.) permission was granted by the Local Government Board to make use of beds in isolation hospitals for the isolation of consumptives, especially advanced cases.

The admission of patients to institutions controlled by sanitary authorities was effected chiefly as the result of notification of pulmonary tuberculosis which had been introduced in some districts, either voluntarily or compulsorily (see below). This enabled the medical officer of health to get in touch with the patient. Treatment was either free or at a rate assessed according to the income of the patient; for under section 131 of the Public Health Act, 1875, local authorities could, if they wished, recover from all patients, other than paupers, the cost of treatment, but there was no compulsion upon them so to do.

VI

SANATORIA

The growth of the sanatorium principle in England has already been described. A comprehensive and detailed account by Bulstrode of the provision of these institutions for treating pulmonary tuberculosis existing in 1907 in England and Wales is to be found as a supplement in continuation of the report of the Medical Officer contained in the 35th Annual Report of the Local Government Board 1905–6. There was some difficulty in defining 'sanatorium' and 'hospital' owing to the fact that nearly all hospitals for consumption had by that time attempted to carry out 'open-air' treatment with a sanatorium regime. The difference is therefore one of degree. The earlier institutions founded in the 'pre-sanatorium' period and, therefore, established purely as hospitals have already been discussed (p. 25). Further, as we are here concerned with the treatment of the poor alone, a distinction must be made between 'public' and 'private' sanatoria, the former being 'mainly institutions erected or provided by public philanthropy, by the State, or by local authorities or associations'. Private sanatoria in connexion with which the promoter had also established a sanatorium for the poorer classes must, however, be included. Table 4 (p. 52), based on a list in Bulstrode's report, gives the sanatoria and kindred institutions existing in 1908, their county distribution, and the number of beds in each. As a matter of interest, the private institutions are also indicated (in italics).

All the public sanatoria indicated in the table were erected since 1899 (the first private sanatorium was

established in 1898); the movement began in the north, in Durham and Westmorland, and gradually spread to the south. Bulstrode describes the sanatoria as a whole as

'a very heterogeneous collection of buildings. Some such establishments consist of already existing houses, slightly modified in the direction of the admission of more light and air, and of the substitution in some cases of impermeable for permeable surfaces; others are special institutions which in the opinion of many persons have been erected upon too extravagant a scale. Some accommodate half-a-dozen patients, some as many as a hundred.

'A nearly similar diversity obtains as regards the sites upon which these institutions are erected. Some are in elevated situations, others are near the sea level. Between these two extremes are found the main bulk of sites.'

A large number of these public sanatoria were promoted in the first instance by a local branch of the 'National Association for the Prevention of Consumption and other Forms of Tuberculosis', founded in 1898 (see below). Their erection was thus promoted by public subscription, while philanthropy too played a large part in their maintenance. The two sanatoria established by poor law guardians have already been mentioned. No sanatorium had been erected by sanitary authorities, but, as has already been stated, many sanitary authorities were maintaining beds in other institutions. Moreover, industrial co-operative societies and kindred bodies were supporting a certain number of beds. The 'Workmen's Sanatorium' at Benenden, Kent, was managed entirely by the working classes for members of their own kind. Finally, some sanatoria were established in connexion with chest hospitals, e.g. the Northwood Sanatorium as a branch of the Mount Vernon Hospital at Hampstead, the

Brompton Sanatorium at Frimley in connexion with the Brompton Hospital, and the Liverpool Sanatorium in Delamere Forest in connexion with the Liverpool Consumption Hospital.

The usual method of admission into public sanatoria, other than those with subsidized beds, was by letter of recommendation from a donor or subscriber, with or without weekly payments by the patient ranging from £1 to £2.

The total number of beds for tuberculosis in the public sanatoria and hospitals amounted at that time (1908) to 3,900, which according to Bulstrode (1908) formed 'but a portion of the total accommodation available if the provision made by the poor law authorities be included'.

TABLE 4. *Sanatoria and kindred institutions in England and Wales in 1908.* (*Private institutions in italics.*)

County	*Institution*	*No. of beds*	*Founded in year*
Bedfordshire	Jewish Sanatorium, Daneswood.	24	1903
Berkshire	Pinewood Sanatorium, Wokingham.	60	1901
Cheshire	Manchester Hospital for Consumption, Bowdon.	50	1885
	Heswall Sanatorium, Liverpool.	24	1902
	Liverpool Sanatorium, Delamere Forest.	40	1901
	Crossley Sanatorium, Delamere Forest.	90	1905
Cumberland	Blencathra Sanatorium, Keswick.	28	1904
Devon	*Dartmoor Sanatorium*, Chagford.	8	
	Devon & Cornwall Sanatorium.	35	1903
	Dunston Park Sanatorium, Paignton.	10	
	Mildmay Home for Advanced Consumption, Torquay.	10	1886
	Western Hospital, Torquay.	40	1850
	Udal Torre Sanatorium, Yelverton.	13	
Durham	*Belle Vue Sanatorium*, Shotley Bdge.	20	

TABLE 4 (*continued*)

County	*Institution*	*No. of beds*	*Founded in year*
Durham	Durham County Sanatorium, Stanhope.	45	1901
Essex	Coppin's Green Sanatorium and Market Garden, Clacton.	20	1906
	Maldon Sanatorium.	12	
Gloucestershire	Birmingham Municipal Sanatorium, Cheltenham.	40	1908
	Cotswold Sanatorium, Stroud.	33	1898
	Painswick Sanatorium, Stroud.	12	
Hampshire	*Alderney Manor Sanatorium*, Parkstone.	25	1900
	Firs Home, Bournemouth.	20	1868
	Hahnemann Convalescent Home, Bournemouth.	32	1879
	Home Sanatorium, Bournemouth.	45	
	Linford Sanatorium, New Forest.	24	1899
	Moorecote Sanatorium.	15	
	National Sanatorium for Consumption and Disease of Chest, Bournemouth.	85	1855
	Overton Hall Sanatorium.	12	
	St. Joseph's Home, Bournemouth.	72	
	Stourfield Park Sanatorium.	40	
Isle of Wight	Royal National Hospital for Consumption and Diseases of the Chest, Ventnor.	155	1867
	St. Catherine's Home, Ventnor.	12	1879
Kent	Benenden Sanatorium.	68	1907
	East Cliff Home, Margate.	130	1898
	Royal Sea-Bathing Hospital, Margate.	162	1791
	Victoria Home for Invalid Children, Margate.	46	1892
	Sandgate Homes.		
Lancashire	Clayton Vale (Small-pox) Hospital, Manchester.	32	
	Crossley 'Home of Peace', Manchester.	25	
	Liverpool Hospital for Consumption and Diseases of the Chest.	30	1863
	Manchester Out-Patient Department.		
	Moor End House, Sheffield.	20	
London	Brompton Hospital for Consumption.	318	1841
	Royal Hospital for Diseases of the Chest, City Road.	80	1814
	Free Home for the Dying.		1891

Table 4 (*continued*)

County	*Institution*	*No. of beds*	*Founded in year*
London	Friedenheim Hospital.	48*	1885
	Home for Consumptive Females.	23	1863
	Hospital of St. John and St. Elizabeth.	17	1856
	Margaret Street Hospital for Diseases of the Chest.	Out-patients only.	1847
	Mount Vernon Hospital for Consumption and Diseases of the Chest.	140	1860
	St. Joseph's Hospital, Chiswick.	48*	1875
	St. Luke's House.	28*	
	St. Peter's Home, Kilburn.	12	
	City of London Hospital for Diseases of the Chest, Victoria Park.	164	1851
Middlesex	Mount Vernon Hospital, Northwood.	100	1904
Norfolk	*The Beeches Sanatorium*, Long Stretton.	6	
	Children's Sanatorium, Holt.	15	1906
	Kelling Sanatorium.	53	1902
	Mundesley Sanatorium.	19	1899
	Southrepps Sanatorium.	7	
Northumberland	Barrasford Sanatorium.	50	1907
	Children's Sanatorium, Stannington.	68	1907
Nottingham	Nottingham Sanatorium, Sherwood Forest.	30	1901
Oxfordshire	*Chilterns Sanatorium.*	30	
	Kingswood Sanatorium.	12	1900
	Maitland Cottage Sanatorium.	24	1902
Somersetshire	Engel Home, Cheddar.	16	
	Mendip Hills Sanatorium, Wells.	24	1900
	Nordrach-on-Mendip Sanatorium, Bristol.	40	1899
	St. Michael's Free Home for Consumptives, Axbridge.	41	1878
Suffolk	*East Anglian Sanatorium*, Nayland.	35	1901
	Maltings Farm Sanatorium, Nayland.	32	1901
Surrey	*Crooksbury Ridges Sanatorium*, Farnham.	24	
	Brompton Hospital Sanatorium, Frimley.	108	1904
	Ockley Sanatorium.	8	

* Not all these beds were available for tuberculous cases.

TABLE 4 (*continued*)

County	*Institution*	*No. of beds*	*Founded in year*
Surrey	*Whitmead Sanatorium.*	20	
	Woodhurst Sanatorium.	13	
Sussex	Eversfield Hospital, St. Leonards-on-Sea.	55	1884
	Fairlight Hall Convalescent Home, Hastings.	22	
	King Edward VII Sanatorium, Midhurst.	100	1906
	Millfield Sanatorium, Littlehampton.	100	1904
	Rudgwick Sanatorium.	13	1900
Wales (North)	*Nordrach-in-Wales Sanatorium,* Penmaenmawr.	23	
	Vale of Clwyd Sanatorium, Ruthin.	20	1901
Wales (West)	West Wales Sanatorium.	28	1908
Westmorland	Westmorland Sanatorium, Grange-over-Sands.	44	1900
Wiltshire	Winsley Sanatorium.	68	1904
Worcestershire	Worcester Sanatorium, Knightwick.	26	1902
	Midland Open-Air Sanatorium, Belbroughton.		
Yorkshire	Bradford Poor Law Sanatorium, Skipton.	33	1903
	Leeds Sanatorium for Consumptives.	78	1901
	Hull and East Riding Sanatorium.	30	1902

VII

ANTI-TUBERCULOSIS DISPENSARIES

It has already been suggested that large numbers of tuberculous patients must have been seen in the out-patient departments of general hospitals and in general dispensaries. But the tuberculosis dispensary, as we know it to-day, did not exist anywhere until the pioneer effort of Robert Philip realized it in Edinburgh in 1887. Soon after 1900 anti-tuberculosis dispensaries were to be found in several countries abroad, especially in France, where, as the result of the work of Calmette, the first dispensary was opened in Lille in 1902; by the end of 1905 there were no less than 62 of these institutions in France, of which 38 were in the region of Paris. In England, however, it was not till 1909 that the first dispensary was opened—in Paddington—by a voluntary committee, and conducted on the Edinburgh plan. On the other hand, it should be admitted that even before that date the out-patient departments were endeavouring to follow the example of Edinburgh in their tuberculosis work, except for home visits.

The idea of the anti-tuberculosis dispensary germinated in Robert Philip's mind as the result of the discovery of the tubercle bacillus. He states (1907):

> 'If the community as such was to benefit practically by the discovery, there appeared to be need of centralised effort in order to ascertain the extent of tuberculosis in a district, and to devise means for its limitation and prevention.'

He envisaged the problem of tuberculosis in a much wider sense than had hitherto been done:

> 'To meet this indication, the method of treatment which

was then the vogue in hospitals was useless. The amelioration, or even cure, of a certain number of cases of tuberculosis could do little to affect the wider issue. The formation of a central institution or dispensary, to which persons of the poor classes affected by tuberculosis should be invited or directed, seemed to offer the basis of a complete solution. Thereby access would be readily obtained to the foci of disease, not merely in the affected individual under examination, but also in other members of the same household and in affected dwellings.

'The tuberculosis dispensary should be, for every city or district, the uniting point of all other agencies. It should not be an isolated institution, but form an integral part. . . . The public should be made aware that the dispensary is prepared to answer all inquiries regarding tuberculosis, and to advise, in a given case, what is best to be done. The dispensary should constitute a centre for the dissemination, in the widest fashion, of information regarding prevention and treatment.'

The vision expressed in these words, written in 1907, twenty years after the foundation of the dispensary at Edinburgh, was not to materialize for another fourteen years—not until 1921, when all county and county borough councils were compelled to establish a tuberculosis scheme, of which the dispensary formed the basis.

The Victoria Dispensary for Consumption in Edinburgh was founded and carried on by voluntary subscriptions and effort. Later a small hospital, and then a sanatorium, were established in connexion with it. Nurse visitors were appointed; and the voluntary Samaritan Committee of Ladies may be termed the prototype of the modern care and after-care committees. In 1907 Philip was stressing also the importance of colonies for 'after-life', and a farm colony was indeed established later to train suitable men in

healthy occupations. Finally, both he and Newsholme (1908) emphasized at that time that, for the tuberculosis dispensary to be effective, 'to draw to itself all the consumptives needing preventive measures as well as curative help', voluntary organizations could not be relied on; they considered that the dispensaries should be maintained by local authorities and placed under the administration of the medical officer of health.

Conclusion

It will be appropriate to conclude this section dealing with the treatment of the tuberculous poor by quotations from an editorial in the *British Journal of Tuberculosis* (1908, ii. 155)—a fitting comment on the situation at the conclusion of the period reviewed here.

'Every year an enormous number of consumptives pass into our workhouse infirmaries. The annual death-roll of these unfortunates affords merely a fractional indication of the great army of tuberculous derelicts dependent on charity and State support. By universal admission, our Poor Law system has been found sadly lacking, and with regard to no class has this failure been more conspicuous, deplorable, and inexcusable than in the case of the destitute consumptive. . . . The period during which a consumptive may be considered to be infective varies greatly, but there is good evidence to show that three years may be accepted as a fair average. For the majority of these chronic cases the State does very little or nothing. The victims are left to struggle and to suffer, dragging into destitution and disease their families and friends, and only too frequently multiplying the evil by the propagation of delicate and tuberculously disposed children. The condition of large numbers of advanced and helpless consumptive cases is deplorable. . . . Those who work among the consumptive cases of our metropolitan and provincial hos-

pitals and sanatoria know well the dread which these patients have of the Union infirmary, and their absolute refusal in most cases to resort to Poor Law relief. No satisfactory advance towards the elimination of the Great White Plague can be effected until rational means are found for the effective segregation and proper care of these infectious consumptive cases for whom no other aid is possible than that which should, and must, be provided by the State.'

VIII

PREVENTION

THE first attempt to consider the preventive aspect of tuberculosis may be said to date from *before* the discovery of the infective nature of the disease. The importance of general sanitation in the causation of phthisis was recognized in the First Report of the Commission, 1844. Dr. W. A. Guy stated that 'the chief cause of the great mortality is the defective ventilation of houses, shops, and places of work. Next to this in point of importance is the inhalation of dust, metallic particles, and irritating fumes.' In an introduction to a report 'On the Different Prevalence of Certain Diseases in different Districts in England and Wales' by E. H. Greenhow, Sir John Simon (1858) considered that his 'figures bear unequivocal testimony to the operation of local causes in the production of tubercular disease. The most important among such local causes is shown by Dr. Greenhow to consist in the industrial relation of the people. The great contrasts are found to lie between populations respectively agricultural and manufacturing.' There was so much other disease at that time that it was natural that general rather than specific measures should be taken; and the great strides made in the sanitation and industrial conditions in the second half of the nineteenth century are undoubtedly reflected in the rapid fall in the tuberculosis mortality.

The discovery of the tubercle bacillus and the establishing of the contagious nature of the disease provided a basis for the adoption of specific measures. The inadequate treatment of consumptives was recog-

nized to be a danger to others through dissemination of the disease; and the importance of segregation in institutions as a preventive measure was brought forward (Newsholme, 1908). Although no organized effort existed, many local authorities were adopting voluntary or compulsory notification at the beginning of the nineteenth century (see below), thus getting in touch with consumptives and their contacts, providing spittoons, shelters, and bacteriological facilities, disinfecting premises, and promoting the principle of a separate room for the tuberculous person. Finally, the forbidding of spitting in public was being constantly urged and adopted.

The National Association for the Prevention of Consumption and other forms of Tuberculosis was probably responsible for stimulating some of this work. It was inaugurated by King Edward VII when, as Prince of Wales, he convened the historic meeting at Marlborough House on December 20th, 1898. This followed a private meeting of some members of the medical profession, held a few months earlier, when it was agreed that a public movement should be inaugurated with the purpose of preventing the ravages of tuberculosis in the United Kingdom. The mission of the Association was 'to carry into every dwelling in the land an elementary knowledge of the modes in which consumption is propagated, and of means by which its spread may be prevented, and thus to strengthen the hands of medical men throughout the country who are dealing with individual cases of that disease'. The objects were stated to be: (1) the education of public opinion and the stimulation of individual initiative; (2) the influencing of Parliament, county councils, boards of guardians, chambers of

agriculture, and other public authorities in matters relating to the prevention of tuberculosis; (3) the establishment throughout the kingdom of local branches of the Association, to be affiliated to the central office. The methods to be adopted in educating public opinion were summarized as follows:

(*a*) A central office for the collecting and distributing of information as to modes of diffusion of tuberculosis, and measures for prevention.

(*b*) The circulation of pamphlets and leaflets, setting forth in plain language the results of scientific investigation of the above points.

(*c*) Public lectures by men approved by the council; addresses at congresses and other public gatherings.

(*d*) Co-operation of the public press.

(*e*) Periodical congresses and the issue of an annual report.

(*f*) The promotion of the establishment of open-air sanatoria for tuberculous patients.

Within a few months over a thousand persons joined the association, the annual subscription being fixed at five shillings.

A congress, attended by many foreign delegates (at which Koch's famous statement on the relation of human to bovine tuberculosis was made) was held in London in 1901. The resolutions passed at that congress are of great interest, and undoubtedly laid the foundation for the organized control of the disease which soon followed:

'(1) Tuberculous sputum is the main agent for the conveyance of the virus of tuberculosis from man to man; indiscriminate spitting should therefore be suppressed.

'(2) It is the opinion of this Congress that all hospitals and dispensaries should present every out-patient suffering from phthisis with a leaflet containing instructions with regard to the prevention of consumption and provide and insist on the proper use of a pocket spittoon.

'(3) That the voluntary notification of cases of phthisis attended with tuberculous expectoration and the increased preventive action which it has rendered practicable have been attended by a promising measure of success, and that the extension of notification should be encouraged in all districts in which efficient sanitary administration renders it practicable to adopt the consequential measures.

'(4) That the provision of sanatoriums is an indispensable part of the measures necessary for the diminution of tuberculosis.

'(5) That in the opinion of this Congress, in the light of work that has been presented at its sittings, medical officers of health should continue to use all the powers at their disposal, and relax no effort to prevent the spread of tuberculosis by milk and meat.

'(6) That the educational work of the great National Association for the Prevention of Tuberculosis is deserving of every encouragement and support. It is through such agency that a rational public opinion may be formed, the duties of public health officers made easier of performance, and such local and State legislation as may be requisite called into existence.

'(7) That this Congress is of opinion that a permanent International Committee should be appointed: (*a*) to collect evidence and report on the measures that have been adopted for the prevention of tuberculosis in different countries; (*b*) to publish a popular statement of these measures; (*c*) to keep and publish periodically a record of scientific research in relation to tuberculosis; (*d*) to consider and recommend measures of prevention.

'(8) That in the opinion of this Congress, overcrowding, defective ventilation, damp, and general insanitary conditions in the houses of the working classes diminish the chance of

curing consumption, and aid in predisposing to and spreading the disease.

'(9) That while recognizing the great importance of sanatoriums in combating tuberculosis in all countries, the attention of Government should be directed to informing charitable and philanthropic individuals and societies of the necessity for anti-tuberculosis dispensaries as the best means of checking tuberculous diseases among the industrial and indigent classes.'

Finally mention must be made of the measures undertaken before 1908 in regard to bovine tuberculosis (Harley Williams, 1932). Under the Contagious Diseases (Animals) Acts, 1878 and 1886, the Local Government Board had the power to make Orders for the registration by the local sanitary authority of all persons carrying on the trade of cow-keepers, dairymen, or purveyors of milk; and for the inspection of cattle, guarding milk against infection, and the general sanitation of premises. Various Orders were made under these Acts in 1885, 1886, and 1899. A departmental committee in 1888 recommended that tuberculosis should be included in the Contagious Diseases (Animals) Acts, but this was not carried into effect mainly on account of difficulty in diagnosis and the protests of pedigree cattle owners. The seizure and destruction of tuberculous meat was, however, strictly carried out in some districts, and in 1890 a deputation of farmers waited upon the presidents of the Board of Agriculture and Local Government Board, to urge that much of the meat from infected cattle could be eaten without danger. A royal commission was appointed, and in their report, published in 1895, it was concluded that (1) animals could be infected by food containing tubercle bacilli, and that, therefore,

man may also be infected in this way; (2) tuberculous disease in man and animals is the same thing; and (3) parts of the carcass most commonly used for food are not those most usually infected with tuberculosis. In regard to milk they found that (1) tuberculosis of the udder must be present before milk is contaminated; (2) the withdrawal from dairy farms of all cows with tuberculosis of the udder would, however, not afford complete security; (3) both bacterioscopic and inoculation tests were necessary to discover the bacilli in milk; and (4) boiling will destroy the bacillus, and heating at a lower temperature for a longer period will also effect this. It was pointed out that cooking of tuberculous meat is not sufficient to kill the bacilli in the centre of a big joint; and that, provided every infected portion is destroyed and the remainder saved from contamination, much of the meat of a tuberculous cow may be used for human food.

Another royal commission issued a report in 1898 on legal provisions. One of the results was the extension of the Dairies, Cowsheds, and Milkshops Orders (1885, 1886, and 1899), to include 'such diseases of the udder as shall be certified by a veterinary surgeon to be tuberculous'. Under the Orders the local authority were to supervise the milk trade in their own district, register all purveyors, and satisfy themselves as to the cleanliness and ventilation of premises; no person suffering from a dangerous disorder might take part in the production, distribution, or storage of milk; no milkshop might be used as a sleeping apartment; and if certain diseases had occurred among the cattle in a dairy, the milk was not to be mixed with other milk or used for human food, or used for the food of animals, until it had been boiled.

Koch's statement on the relation of human and bovine tuberculosis at the 1901 congress and the appointment of a royal commission to investigate the truth of his contentions have already been discussed.

PART II

THE CONTROL OF TUBERCULOSIS SINCE 1908

IX

NOTIFICATION OF PHTHISIS BEFORE 1908

It has previously been pointed out that although no organized control of tuberculosis by the State existed before 1908, various sanitary authorities had in the first few years of this century introduced voluntary, or even compulsory, notification of phthisis to enable them to get into touch with consumptives and offer them advice and facilities for treatment. As the first official step in the administration of tuberculosis was the introduction by the Local Government Board in 1908 of compulsory notification of patients with phthisis in poor law institutions and those attended by district medical officers, it will be of interest to indicate briefly the position of notification in this country before 1908.

Voluntary Notification

This implied the system by which any medical practitioner attending a case of pulmonary tuberculosis was at liberty, and indeed encouraged, to notify it to the sanitary authority; a fee was paid by the latter—half a crown or one shilling, according as the notifier was a general practitioner, a poor law medical officer, or the medical officer of a public institution. Such notification, as a rule, applied to all types of pulmonary tuberculosis. In certain towns, however, as in Liverpool and Cardiff, the sanitary authority requested that only such persons be notified as were, in the opinion of the practitioner, living under circumstances in which the advice of the sanitary department was likely to be of use; in other districts no fee

was paid if the case was notified shortly before death. In Brighton notification of persons *in extremis* was discouraged; at St. Pancras the patient's assent had to be obtained before notification, and no action was taken by the sanitary authority except on special written request. Finally, it should be noted that no provision was made anywhere for removing from the list of notified persons those who had recovered from the disease.

Voluntary notification of phthisis was in existence in Oldham in 1892, and was introduced in 1899 in Manchester by Dr. Niven and in Brighton by Dr. Newsholme. In both these towns the number of notifications soon exceeded the number of deaths. In Brighton, where a large number of cases were 'invited to reside' in the isolation hospital for a few weeks free of charge, an increasing number of specimens of sputum were sent for bacteriological examination by the medical practitioners. In Liverpool voluntary notification came into operation in 1901, and in Cardiff two years later. In the latter town a woman inspector was appointed to visit all cases notified; the bacteriological examination of sputum was carried out free of charge; and spitting in public places or in vehicles was made punishable by law. Warrington and Stockport also made phthisis voluntarily notifiable in 1903, and Scarborough in 1904. Exeter, Bath, and Salford followed suit. In Salford the practitioner was given the option of stating whether he wished the patient to be visited by the lady visitor appointed for the purpose.

Within the next four years voluntary notification of phthisis was introduced in several other districts. The results of this measure varied greatly, and were found to depend on the popularity and tact of the

public health officials and on whether the relations between the latter and the general practitioners were of a personal character or not; this was decided usually by the size of the community.

Compulsory Notification

The only two districts in which notification of phthisis had been made compulsory—by local acts of Parliament—before 1908 were the towns of Sheffield and Bolton. It should be noted that such notification did not place the disease on the same footing as other infectious diseases, like scarlet fever, the notification of which, by the Public Health Act, 1875, and other Acts, could involve (1) compulsory removal by order of a justice to an isolation hospital in certain circumstances, and (2) penalties for wilful exposure in public places, and for selling or lending infected articles. When local authorities proposed notification on these lines, the Local Government Board refused to agree, considering that the chronicity of pulmonary tuberculosis made such action impracticable. Compulsory notification of phthisis was, therefore, introduced mainly with the object of protecting medical practitioners against any penalties to which they might conceivably be subjected for notification of a disease not otherwise statutorily subject to notification. In Sheffield voluntary notification of infectious cases of pulmonary tuberculosis, introduced in 1899, was replaced by compulsory notification of all cases in 1903. The Act for this purpose contained the clause that 'no provisions contained in any general or local Act of Parliament relating to infectious diseases shall apply to tuberculosis of the lung or proceedings relating thereto'. In the following two years 1,060 deaths

from phthisis were registered in Sheffield, and of these only 62 died without having been previously notified.

In Bolton voluntary notification was adopted in 1902 and was made compulsory in 1905, subject to the difference between phthisis and acute infectious diseases indicated above.

X

CONTROL OF TUBERCULOSIS BEFORE THE GREAT WAR

The development of State control of tuberculosis since 1908 can best be traced in the annual reports of the Local Government Board and, since 1919, in those of the chief medical officer of the Ministry of Health ('On the State of the Public Health'). Although the first mention of phthisis in these reports does not occur till the year 1908–9 (the 38th report), the State had not been entirely unconscious of the problem before that time. Following the publication in 1865 of Villemin's experiments on the transmission of tuberculosis to animals, Sir John Simon, medical officer of the Privy Council, enlisted the services of Sir John Burdon-Sanderson to carry out experiments in order to confirm Villemin's findings. Scientific grants from the Local Government Board for research work in tuberculosis were given both before and after Koch's discovery of the bacillus. In 1888 a departmental committee was appointed to consider problems in connexion with tuberculosis in cattle; and experiments on the subject of tuberculous meat were carried out under the direction of the veterinary department of the Privy Council. Later the royal commissions of 1891 and 1896 considered the effect on man of food derived from tuberculous animals (including meat). Mention has already been made of the royal commission appointed to investigate the truth of Koch's statement in 1901 that human tuberculosis could not be transmitted to animals and that tuberculosis of bovine origin was very rare in man. And the report

on sanatoria by Dr. H. T. Bulstrode, one of the medical inspectors of the Local Government Board, has been frequently referred to in part I of this book. Lastly, the interest of the State was further shown by the sending of two delegates by the Local Government Board to the International Congress on Tuberculosis in Paris in 1905.

Following the establishment of the school medical service by the Board of Education in 1907—a step which probably led to the detection of much tuberculosis in children and the removal of causes favouring its occurrence—the Local Government Board took the first measure in the organized control of tuberculosis in 1908. Profiting by the experience gained in districts which had adopted voluntary or compulsory notification of phthisis, they issued the Public Health (Tuberculosis) Regulations under section 130 of the Public Health Act, 1875, as amended by the Public Health (London) Act, 1891, and the Public Health Act, 1896: 'from time to time, to make, alter, and revoke Regulations for preventing the spread of endemic or infectious disease; and to provide for the enforcement and execution of the Regulations'. The regulations came into operation on January 1, 1909, and provided 'for the notification to the medical officer of health of sanitary authorities of cases of pulmonary tuberculosis occurring amongst the inmates of poor law institutions, or amongst persons under the care of district medical officers, and for the taking of certain measures in such cases'. Notification had to be made within 48 hours on printed forms provided by the guardians, to the medical officer of health of the district in which the patient resided before admission. Moreover, the superintending officer (generally the

Master) of the poor law institution had to notify the medical officer of health of the address to which the inmate went on discharge and the district medical officer of any change of address of notified patients in his district. Fees to medical officers of 1*s*. for a first notification and 6*d*. for a second, and 3*d*. to a superintending officer of a poor law institution were paid by the sanitary authorities to whom the notification was made. The Local Government Board were careful to point out to sanitary authorities that

'nothing in the Regulations shall have effect so as to apply or authorize any one to put in force with respect to a person in relation to whom a notification has been made any enactment which renders him or any other person liable to a penalty or subjects him to any restriction, prohibition, or disability affecting him or his employment, occupation, means of livelihood, or residence on the ground of his suffering from pulmonary tuberculosis'.

On the other hand,

'Subject to what is stated in the preceding paragraph, it is desirable that sanitary authorities acting on the advice of their medical officers of health, should utilize their powers for the purpose of preventing the spread of infection from pulmonary tuberculosis. The Order confers some special powers which the Board are advised are suitable for this purpose.'

The latter were summarized as: (*a*) destruction and disinfection of infected articles, and cleansing or disinfecting of premises; (*b*) facilities for diminishing the risk from occupation of rooms; and (*c*) provision of apparatus or utensils of assistance to prevention. Sanitary authorities could also provide and publish or distribute in the form of placards, handbills, &c., summaries of information regarding pulmonary tuberculosis.

A memorandum (1909) was therefore published by the Board setting out in detail 'the administrative measures which it is practicable to take against tuberculosis, and the different forms of aid that can be given to patients either through administrative or voluntary agencies'. Educational measures, early diagnosis (and therefore bacteriological examination), and home-training and supervision, were stressed; and the importance of the tuberculosis dispensary, sanatorium treatment, and the admission of advanced cases into institutions emphasized.

The State was thus in fact beginning to act as an adviser to sanitary authorities, to whom was left the option of following the advice or providing facilities framed more in a preventive than a curative spirit.

It was obvious, however, that in order to influence the incidence of tuberculosis by these measures, they had to be made available to more than a fraction of the community. In 1911, by the Public Health (Tuberculosis in Hospitals) Regulations, it was made compulsory to notify patients with pulmonary tuberculosis receiving treatment in public institutions; notification was to be made to the medical officer of health of the district in which the institution was situated, and he would notify the medical officer of health of the district in which the patient resided, informing the medical officer of the institution that he had done so at the same time. About six months later, however, the Public Health (Tuberculosis) Regulations, 1911, extended notification to all cases of pulmonary tuberculosis. This step was prompted by the fact that although the districts in which voluntary notification was adopted had increased from 15 in 1908 to 283 in 1910 (25 metropolitan boroughs, 41 county and 53

municipal boroughs, and 103 urban and 61 rural districts), the number of notifications in a year was generally exceeded by the number of deaths and only moribund cases were being notified. The Order making pulmonary tuberculosis generally notifiable also gave local authorities wide general powers, in that they could, on the advice of their medical officer, 'supply such medical assistance, facilities, and articles as may be necessary for detecting pulmonary tuberculosis, for preventing the spread of infection, and appoint additional officers for this purpose'.

At the beginning of 1911 the total number of beds provided by sanitary authorities specially for phthisis was 600, but about 3,700 were provided by private enterprise or charity. The medical officer of the Local Government Board stresses the importance of voluntary agencies, especially in regard to tuberculosis dispensaries, where 'also in some instances' (!) 'the relatives of consumptives, with a view to detecting incipient cases of the disease' were examined. Local authorities are advised that they may provide portable open-air shelters and out-patient hospitals or dispensaries at which any inhabitant of the district suffering from tuberculosis could be received for medical treatment and advice. Fourteen sanitary authorities had that year provided tuberculosis dispensaries and in 50 other districts voluntary dispensaries were available.

Rapid development was taking place. A year later (December 1911) the number of beds provided by sanitary authorities had increased to 1,500, and 57 authorities were subsidizing or contracting for the use of beds in private sanatoria. Over 30 dispensaries had now been established by them. Moreover, in London the special wards of the poor law institutions numbered

3,000 (for pulmonary and non-pulmonary cases), and the Metropolitan Asylums Board had made special provision for tuberculous children; in the provinces the poor law beds for tuberculosis numbered about 9,000, and four poor law authorities had provided separate sanatoria.

An interesting power given to St. Helens by a local Act in 1911—a power which was not to be made general till 1925—must be mentioned. The medical officer of the borough could in certain circumstances make application to a court of summary jurisdiction for an order for 'the removal of a person suffering from pulmonary tuberculosis to a suitable hospital or place for the reception of the sick, provided within the borough or within a convenient distance of the borough and for the detention and maintenance of such person therein for such period not exceeding 3 months as may be determined by such order'.

Up to now the wide powers given to sanitary authorities in connexion with the treatment and prevention of tuberculosis, except in regard to notification of pulmonary tuberculosis, were entirely optional, and no pressure could be brought to bear upon authorities who did not wish to avail themselves of them; nor was the financial aspect considered. Important changes were therefore brought about by the National Insurance and Finance Acts, 1911, when the State, no longer content to act merely as adviser, took steps to ensure the treatment of a section, at least, of the tuberculous poor.

The National Insurance Act, 1911

This Act, considered 'perhaps the greatest social measure of our generation, and indeed the most im-

portant influence in medicine since the Public Health Act 1875', was promoted by Mr. Lloyd George as Chancellor of the Exchequer, to provide insurance against ill health and unemployment; the State thus generalizing and organizing functions hitherto in some fashion carried out by 'medical clubs' in industrial areas and friendly societies respectively. Health insurance applied to almost all employed persons receiving less than a certain wage or salary; insurance against unemployment applied to certain specific trades only. Originally the employer and employee each paid in fourpence per week; later the total was increased to ninepence by the government—'ninepence for fourpence'. There was much opposition to the bill, not only from political opponents, but also from the medical profession and the friendly societies. Nevertheless, it was duly passed, although the Chancellor was forced to modify some of the original points, and it became law on July 1, 1912. The friendly societies and trade unions agreed to become approved societies for purposes of administering sickness benefit. 'Medical benefit' was, however, entrusted to local insurance committees, composed of local authority representatives, who arranged in each area for a panel of doctors. Fourteen million people became entitled to medical and sickness benefit by the Act, the administration of which was placed in the hands of a central body termed the Insurance Commissioners. A medical committee, consisting of medical men, was appointed in each district to advise the insurance committee on professional matters. Of the committee's members three-fifths represented the insured persons in the area, one-fifth were elected by the councils of counties and county boroughs, and two members, appointed by the

local medical committee, represented the medical practitioners in the area. The doctors 'on the panel' were remunerated by a yearly capitation fee, and no one was permitted to have more than 3,000 insured persons on his list. (In 1924 regulations were issued, altering this limit to 2,500, unless the doctor had a paid fulltime assistant, when the number might be raised to 4,000.)

Although the Act dealt mostly with matters outside the jurisdiction of the Local Government Board, local authorities were affected by it as employers of labour and were invested with certain powers and duties in connexion with the administration of the Act. As already mentioned, the councils of counties and county boroughs were to be represented upon the insurance committees constituted for every county and county borough, and the county councils were to be consulted by the insurance committees in connexion with the preparation of schemes for the establishment of district insurance committees in boroughs, urban districts, and other areas. A rather interesting proviso—the only claim, it is stated, the Act had to be a factor in preventive medicine—was that where sickness among insured was excessive, the local authority might be rendered liable to defray any excess expenditure incurred by an insurance committee or approved society if such excessive sickness was due to neglect to observe or enforce the statutes relating to public health or housing of the working classes. (This was soon admitted to be unworkable and was not retained in subsequent Acts.) Finally, county and county borough councils were empowered in certain circumstances to make good jointly with the Treasury any deficiency in the expenditure of insurance com-

mittees in connexion with the medical and sanatorium benefits provided under the Act.

'Sanatorium benefit' was dealt with under section 16 of the Act:

'the insurance committees, which are to be established for every county and county borough, are to make arrangements to the satisfaction of the Insurance Commissioners (with a view to providing treatment for insured persons suffering from tuberculosis or such other diseases as we [the Local Government Board], with the approval of the Treasury, may appoint) with persons or local authorities having the management of sanatoria or other institutions approved by us, and a local authority is authorized to provide such treatment for persons resident outside, as well as within their area. Insurance committees must also make arrangements to the satisfaction of the Insurance Commissioners (with a view of providing treatment for such persons otherwise than in such institutions) with persons and local authorities undertaking such treatment in a manner approved by us, which treatment we may authorize a local authority to undertake. In neither case, however, must such arrangements be made with a poor law authority.'

Payment was to be made through the insurance committees out of the funds made available for the purpose, which were fixed as 'one-third in respect of each insured person in each year out of the funds from which benefits are payable, and an additional penny in respect of each person in each year out of moneys provided by Parliament'; the whole or part of the latter sum could be retained by the Insurance Commissioners for purposes of research.

No distinction was made in the Act between pulmonary and other forms of tuberculosis. This may have been instrumental in encouraging the Local Government Board to take the last step in regard to

notification of tuberculosis by issuing on December 19, 1912, the Public Health (Tuberculosis) Regulations, 1912, which consolidated the three previous orders as to notification, and extended compulsory notification to all forms of tuberculosis. Notifications were to be sent by the medical practitioner to the medical officer of health of the district in which the patient was residing.

For the administration of 'sanatorium benefit' under the National Insurance Act it was essential that a sufficient number of beds should be available for the treatment of the persons who became eligible for it under the Act. By the Finance Act, 1911, a grant of £1,500,000 was therefore made from the Exchequer to aid the provision of sanatoria and other institutions for the treatment of tuberculosis ('and such other diseases as the Local Government Board, with approval of the Treasury, may appoint'). The grant was to be divided according to the population of the counties, £1,116,000 being allocated to England.

Some organization of the schemes was essential, and in February, 1912, the Chancellor of the Exchequer appointed a committee, under the chairmanship of Mr. (now Lord) Astor, 'to report upon the consideration of general policy in respect of the problem of tuberculosis in the United Kingdom in its preventive, curative, and other aspects, which should guide the government and local bodies in making or aiding provision for the treatment of tuberculosis in sanatoria and other institutions or otherwise'. An interim report was issued within a few months and the final report in the following year.

The committee considered that the organization of schemes throughout the country would best be carried

out if undertaken by local authorities, 'as in a disease such as tuberculosis the prevention of infection, the removal of conditions favouring the infection, and the treatment of the patient must necessarily be placed in closest relation to each other'; and that the schemes, drawn up by the councils of counties and county boroughs, should be made available for the whole community. They recommended that (the then) existing public health administration should be supplemented by the establishment and equipment of two units linked up to general public health and medical work then carried on, and working in harmony with the general practitioner: the first unit to consist of one or more tuberculosis dispensaries, and the second of institutions in which in-patient treatment would be given. A complete scheme thus provided for (1) the medical officer of health of a county or county borough council as chief administrative officer; (2) tuberculosis medical officers; (3) dispensaries (including a system of home visiting); (4) sanatoria for early cases; (5) hospitals for intermediate and advanced cases. Moreover, they added, in developing schemes the needs of children should be carefully borne in mind, and in some instances it might be desirable to provide special schools for children affected or threatened by tuberculosis.

The Local Government Board expressed general agreement with the findings of the committee and invited councils to submit schemes at an early date, these schemes to be available for the whole population whether insured or not.

'Sanatorium benefit' began on July 15, 1912, and the county and county borough councils were circularized and urged to make arrangements with insurance

committees for the treatment of insured persons in any institution which the councils might have available for the treatment of tuberculosis, and to arrange, as far as possible, that the services of the medical officer of health should be available for assisting or advising the insurance committee in the discharge of their duties in administering 'sanatorium benefit'. Another circular letter (July 1912) dealt with 'domiciliary treatment' of tuberculosis for insured 'under care and direction of a registered medical practitioner, subject to the general supervision of the "consulting officer"'.

But the Insurance Act did not cater for insured persons alone; for by section 17, insurance committees were empowered to extend 'sanatorium benefit' to the dependants of insured persons, and if the amount available was not sufficient for their maintenance too, the Treasury and councils might each make good half of the deficiency. In July 1912, the Government decided to provide, in addition, half the estimated cost of treating non-insured persons, as well as the dependants of insured persons. Approval by the Local Government Board of all schemes was, however, to be obtained first.

Legally hospitals, sanatoria, and dispensaries for the treatment of tuberculosis could be provided by local authorities under section 131 of the Public Health Act, 1875, powers that had up to then not been extensively used: 'to provide for the use of the inhabitants of their district hospitals or temporary places for the reception of the sick'. Such powers were not available to county councils; but under section 64 of the National Health Insurance Act, 1911, the Local Government Board could authorize any county council, to which

a grant had been made in aid of provision of sanatoria or other institutions, to provide any such institution.

We thus see that although the State could not *compel* local authorities to provide schemes, it was provided by means of financial measures with an excellent weapon not only for encouraging the less progressive authorities but also for controlling in some degree the extent and efficiency of the schemes established.

Schemes were submitted rapidly. By August 1913, 211 tuberculosis dispensaries, and the institutions shown in table 5, for the treatment of insured persons had been 'approved', and schemes had been submitted

TABLE 5. *Institutions approved for the treatment of tuberculosis in insured persons (August, 1913)*

	No. of institutions		*No. of beds*	
Class of institution	*Local authorities*	*Voluntary bodies*	*Local authorities*	*Voluntary bodies*
Sanatoria (including chest hospitals) .	15	88	1,064	3,813
Isolation hospitals .	87	..	2,333	..
General hospitals .	..	21	..	203
Children's institutions .	..	8	..	351
Total	102	117	3,397	4,367

relating to over 75 per cent. of the population of England: of the 50 county councils—34 complete and 8 partial schemes, and of the 72 county boroughs—50 complete and 11 partial schemes.

Tuberculosis officers acting under the medical officer of health were being appointed (as recommended by the departmental committee), and by 1913, 63 had been approved in the counties and 45 in the county

boroughs. In some cases the medical officer of health was allowed to act as tuberculosis officer.

It was found in regard to the grants made by the Treasury that circumstances other than merely the size of the population of the district needed to be taken into account, such as the incidence of tuberculosis, sanitary conditions, &c. Grants were also made to voluntary bodies on condition that the institutions would be handed over to the appropriate council if at any time they could not continue the work or if the latter was not carried out to the satisfaction of the Local Government Board.

In London the problem offered certain additional difficulties. In the interim report it was suggested that hospitals and sanatoria should be provided by the Metropolitan Asylums Board and dispensaries by the metropolitan boroughs. But the Metropolitan Asylums Board had been constituted under the Metropolitan Poor Act, 1867, so that although its powers and duties had been extended beyond the scope of the laws relating to the relief of the poor and only about 40 per cent. of the cases treated in the infectious diseases hospitals were poor law cases, the Board had still to be regarded as a poor law authority, and, therefore, according to the National Health Insurance Act, as one with which the insurance committees were debarred from making direct arrangements for treatment. As, however, the Metropolitan Asylums Board was in a position to make the necessary arrangements and provide the accommodation, this difficulty was removed by section 39 of the National Health Insurance Act, 1913, the London County Council and the Metropolitan Asylums Board having, in the meantime, entered into negotiations and having already provided 300 beds at Downs

Hospital, Sutton, and 200 at the Northern Hospital, Winchmore Hill. Until 1930, therefore, the metropolitan boroughs provided the dispensaries and the Metropolitan Asylums Board the institutions; the Local Government Act of 1929, by abolishing the Metropolitan Asylums Board, transferred the institutions to the London County Council. By August 1913, 26 dispensaries had been approved in London; where a voluntary dispensary or one in connexion with a hospital existed this was utilized by the local authority.

The initiation of the important steps in public health administration as a result of the National Health Insurance Act was not unassociated with public interest and controversy.

'Much public interest has been evinced during the period under review in the question of the treatment of tuberculosis, and a good deal of political controversy has centred round it, especially in so far as it is concerned with the administration of "sanatorium benefit" under the National Health Insurance Acts, 1911 & 1913. Debates in Parliament on the topic have occurred with frequency, and, as a result, the misconceptions previously prevalent have been in some degree removed and the important public health considerations which are involved have come into prominence' (*Annual Report of the Local Government Board*, 1913–14).

It could be stated in 1914 that

'the framing and development of such schemes have proceeded steadily throughout the year, and, on review of the present position, we are of opinion that the progress which has been made during the year with the provision of the necessary institutions is not unsatisfactory' (*ibid.*).

Only five county councils and six county boroughs had not submitted schemes; there were difficulties with some authorities, especially in scattered areas, but it was found effective to point out to them that by not

developing schemes they were, through the National Exchequer, contributing to the treatment of inhabitants in other districts without deriving any benefit themselves.

TABLE 6. *Work under tuberculosis schemes from January 12 to December 31, 1914*

		Insured	*Uninsured*
Dispensaries (outside London)	No. examined for first time (including contacts)	25,865	34,644
	No. diagnosed as tuberculous	26,753	22,307
	No. under treatment or observation on Dec. 31	19,253	22,022
(London)	No. examined for first time (including contacts)	3,168	13,660
	No. diagnosed as tuberculous	2,941	7,040
	No. under treatment or observation on Dec. 31	3,106	13,459
	No. sent to hospital for diagnosis or treatment	179	860

Number of patients sent by county councils and county boroughs to residential institutions for the treatment of tuberculosis

Pulmonary tuberculosis	12,622	2,914 adults 2,114 children
Non-pulmonary tuberculosis	228	68 adults 608 children

Other points stressed by the Local Government Board in 1914 must be mentioned. Insured persons were getting priority in treatment, and it was not

sufficiently known that the schemes were available for the uninsured. Provision for non-pulmonary patients could not be considered clearly, as the incidence of these cases was not yet well known, notification of non-pulmonary tuberculosis having only recently been introduced. Provision of hospitals for advanced cases was inadequate; and the relation of the schemes to the poor law unsatisfactory. Finally, stress was laid on the importance of providing institutions at the lowest possible cost and of utilizing institutions already existing.

The work in connexion with the tuberculosis schemes at the beginning of the Great War is summarized in table 6.

XI

CONTROL OF TUBERCULOSIS DURING THE GREAT WAR

The development of the control of tuberculosis would no doubt have made rapid progress but for the calamity which befell Europe in 1914. Special arrangements had to be made for tuberculous soldiers and sailors, not only for those from England, but also for those from the colonies. Workhouses and infirmaries were taken over by the military authorities, and this indirectly tended to increase the accommodation for tuberculous persons, since the local authorities had to find other accommodation for the tuberculous patients in the institutions taken over. This also applied to certain tuberculous institutions, e.g. the Killingbeck Sanatorium, Leeds. Much dislocation of work occurred owing to the fact that many tuberculosis officers resigned or were granted leave in order to join the fighting services. Moreover, in 1915 an embargo was laid on the construction of new sanatoria. Nevertheless, some progress was made. By April 1916, there were approved 130 institutions (5,258 beds) belonging to local authorities and 158 (5,969 beds) to voluntary bodies, 355 dispensaries (319 provided by local authorities), and 257 tuberculosis officers (of whom 110 had resigned temporarily or permanently). In April 1919, the number of beds available in voluntary institutions and in sanatoria and hospitals owned by local authorities had increased to 13,523.

XII

PROGRESS IN CONTROL OF TUBERCULOSIS SINCE THE GREAT WAR

THE experience gained in the first few years of the working of the tuberculosis schemes demonstrated how artificial was the distinction between insured and uninsured tuberculous patients, and how complicated the financial arrangements. Thus the annual cost of a scheme was defrayed in the first instance by the local authority. After deducting the receipts from insurance committees, half the net deficit was paid by the Local Government Board, the money for this purpose being voted annually by Parliament, and the remaining half was borne by the local authority out of rates. Simplification was essential.

The Ministry of Health

The establishment of the Ministry of Health by the Ministry of Health Act, 1919, had an important influence upon the prevention and treatment of tuberculosis; for the Ministry assumed the responsibilities and functions of both the Local Government Board (whose work included supervision of the poor law) and of the Insurance Commissioners; moreover, closer accord was established with the medical services of the Board of Education, since the chief medical officer of the Ministry also became the chief medical officer of the Board of Education. Power was also given to transfer any other powers to the Ministry of Health by simple Order in Council. Thus, much coordination in the public health services resulted, and a special department solely concerned with tuberculosis

was set up. The work in this department was tackled energetically.

In his first report (1919–20) the Chief Medical Officer thus sets out the principles of the campaign against tuberculosis.

> 'First we must fortify the *powers of resistance* of the individual by sound nutrition—a very large and important sphere—and where practicable by immunization. Secondly, we must prevent, as far as may be, the *spread of infection* from the diseased, and by means of milk and meat. Thirdly we must press on with all the *general sanitary reform* which is necessary, including improved housing, lessened over-crowding, industrial welfare, the teaching of hygiene, the extension of open spaces, healthy school life, and so forth. Lastly, we must revise the organization of the *particular method* with which we have made a substantial beginning—notification, domiciliary and dispensary treatment (398 dispensaries), open-air schools, tuberculosis officers (300), the sanatorium (176 sanatoria, with 9,600 beds), the training colony, the hospital for pulmonary and non-pulmonary cases (3,800 beds for adults and 2,300 for children), the village settlement, and proper means of after-care; and the local administration of these matters must be unified under the local authority and its Medical Officer of Health.'

The close relations of tuberculosis to other health matters is here stressed; and mention of the training colony, the village settlement, and after-care indicates that the importance of the patients' problem of existence and livelihood after leaving the institution was being realized. These will be discussed fully in part III of the book, and need not be described further here.

Inspection of the metropolitan tuberculosis dispensaries was undertaken by Dr. Chapman, of the Ministry of Health, and Dr. (now Sir Frederick) Menzies, of

the London County Council. Much diversity in equipment and working was discovered and a need for improvement felt. The more important recommendations stressed the need for better co-operation with the general practitioners, for the development of a preventive outlook (especially in regard to the examination of contacts), and the avoidance of 'treatment' at the dispensary, which too often came to resemble an ordinary hospital out-patient department.

The embargo on new buildings had been removed in 1918, but local authorities were now encouraged to purchase army and Red Cross huts—an unwise procedure as is now evident; for these unheatable temporary structures persist to this day as part of sanatoria in districts where local authorities perhaps still find in Bodington's dictum 'the colder the air, the better for the consumptive' justification for not replacing them with modern permanent buildings.

In 1920 local authorities were authorized to spend a limited sum of money on 'extra nourishment' for tuberculous patients, a practice already adopted by the insurance committees.

The Public Health (Tuberculosis) Act, 1921

The passing of this Act forms another milestone in the administration of tuberculosis, for it *imposed* on county and county borough councils the duty of providing a scheme for the treatment of tuberculosis in their areas, and on May 1, 1921, 'sanatorium benefit' ceased to be one of the benefits available for insured persons, who now came under the tuberculosis schemes on the same footing as the rest of the population. The Act also gave these councils the power to 'make such arrangements as they may think desirable for the

after-care of persons who have suffered from tuberculosis'.

It will be of interest to give certain figures in regard to the state of the tuberculosis schemes in that year. There were now 421 dispensaries with 339 tuberculosis officers, 443 institutions (of which 233 were voluntary) with 18,943 beds (of which 7,681 were in voluntary institutions). Lack of organization is perhaps shown by the fact that on April 1, 1922, only 14,793 of these beds were occupied. The Chief Medical Officer of the Ministry of Health comments that 'notification still remains incomplete and delayed, partly due to the physician, partly due to the patient' and illustrates this statement by quoting that at Barnsley 87 per cent. of deaths from tuberculosis occurred in persons never notified or only notified within six months of death. The administration of tuberculosis schemes he describes as often falling 'short of the efficiency desirable because there is lack of co-ordination', and the following examples are given: casual inspection of too many patients and doling out of medicine in order to keep them attending; insufficient contact work; no co-operation with general practitioners; scanty home visiting; keeping of records at the head office so that they are not readily available to the tuberculosis officer; no after-care arrangements in many districts.

The post-War economic crisis was now being experienced and for the next few years local authorities were urged to practise economy, resulting in little expansion of the schemes.

In 1925, general practitioners were circularized with regard to the still unsatisfactory state of notification, but the subsequent reports of the Chief Medical

Officer tend to indicate that not much improvement followed as a result of this effort.

The Public Health Act of 1925 made further provisions in regard to tuberculosis. In section 62 a clause was inserted providing for compulsory segregation. This had first been inserted in a local Act for St. Helens in 1911, and in several others since then, and was now extended to all county councils and local sanitary authorities.

'Where it is proved to the satisfaction of a court of summary jurisdiction—(*a*) that any person suffering from pulmonary tuberculosis is in an infectious state; and (*b*) that the lodging or accommodation provided for that person is such that proper precautions to prevent the spread of infection cannot be taken, or such precautions are not being taken; and (*c*) that serious risk of infection is thereby caused to other persons; and (*d*) that a suitable hospital or institution exists for the reception and accommodation of that person; the court, upon the application of the county council or of the local authority, may, with the consent of the superintending body of the hospital or institution, make an order for the removal of that person to that hospital or institution and for his detention and maintenance therein for such period not exceeding three months as the court think fit.'

MacNalty (1932) comments that

'in practice local authorities have seldom found it necessary to take action under this Act. The majority of infectious persons suffering from tuberculosis are usually only too glad to avail themselves of the medical care and skilled nursing which they obtain in a hospital. In a minority of instances where the patient or his family have at first opposed removal to hospital, knowledge of the powers of compulsory removal has been sufficient to ensure eventual compliance.'

Nevertheless it remains true, as will be re-emphasized later, that far too many advanced sputum-positive

cases insist on staying, and are allowed to stay, in their homes to be a constant danger not only to adults but to children (and even babies), and the legal powers are not used, perhaps through some misguided sentimental consideration or in ignorance of the risk which children run in these circumstances.

Section 67 of the Public Health Act, 1925, further extended the powers given by the Public Health (Tuberculosis) Regulations, 1912, in regard to the educational aspect by authorizing local authorities to 'arrange for the publication within their area of information on questions relating to health or disease, and for the delivery of lectures and the display of pictures in which such questions are dealt with'.

In the same year a further safeguard against the spread of tuberculosis was afforded by the Public Health (Prevention of Tuberculosis) Regulations, 1925, by which it was forbidden for any person who was aware that he was suffering from pulmonary tuberculosis to be employed in any occupation connected with a dairy, which would involve the milking of cows, the treatment of milk, or the handling of vessels used for containing milk. A local authority could, on a report in writing of their medical officer of health that a person who is engaged in such an occupation or employment dealing with milk is in an infectious state of pulmonary tuberculosis, prohibit the person from continuing his employment. The person had the right to appeal to a court of summary jurisdiction.

Yet another important (purely administrative) measure adopted in that year must be mentioned. The need is obvious for adequate transferable case-records of patients, particularly in connexion with a scheme which often results in an individual patient

being looked after at different times during the course of his illness by different medical officers. A series of forms, embodying a system of case-records, was therefore suggested in the second schedule to the Ministry's memorandum 37/T. These forms were gradually adopted throughout England and Wales. In order to determine the extent, and estimate and compare the value of work done under the approved schemes of local authorities, the Ministry of Health in the memorandum 37/T, issued in 1925, prescribed the annual returns to be furnished by the chief administrative tuberculosis officers (that is, the medical officers of health) of local authorities, and the records to be kept by tuberculosis officers and medical officers of residential institutions approved for the treatment of tuberculosis. A revised form of this memorandum was issued in 1930. In addition to the obligatory items an optional return relating to the after-histories of patients is included.

In 1927 returns showed the following numbers on the notification registers: 15,404 in county areas; 138,334 in county boroughs; and 55,506 in the metropolitan boroughs, i.e. 344,244 in the whole country, giving proportions of 7·6, 11·4, 12·2, and 9·5 per thousand of the population respectively. Definite cases of tuberculosis under the general supervision of the dispensaries totalled 90,113 in the county areas, 85,371 in county boroughs, 23,510 in the metropolitan boroughs, or 198,994 in the whole population; this gave ratios of registered to supervised cases of 100: 60, 100 : 62, 100 : 42, and (an average of) 100 : 58 respectively.

In 1927 the Chief Medical Officer of the Ministry of Health first mentions the subjects of workshops

and schemes for the employment of tuberculous workers; these will be discussed further in a later section.

Before describing the next important step in the administration of tuberculosis, which resulted from the Local Government Act, 1929, it will be of interest to indicate the extent of the schemes at that time. Table 7 shows the institutional accommodation on April 1, 1929. In addition 473 dispensaries (and 73 other premises for special treatment such as orthopaedics) with 382 tuberculosis officers were approved.

The Local Government Act, 1929

The foundation of the changes brought about by this Act may be said to have been laid in the report of the royal commission of 1905–9, which overhauled the whole question of the poor law; recommended the abolition of the boards of guardians, the union of parish areas and the general mixed workhouses; suggested placing the administration of the poor law under the directly elected councils of counties and county boroughs; and favoured the establishment of preventive and curative poor law medical services. The poverty scale with its stigma and the associated principles of repression and deterrence were to be replaced by a different conception—destitution to mean destitute of the necessities of a healthy life—and the public health service would involve the whole community. The Local Government Act, 1929, among other matters not relevant to medicine, gave practical expression to these recommendations. It abolished the boards of guardians and transferred their duties and resources to the councils of counties and county

boroughs. Their duties in regard to assistance were to be carried out by public assistance committees under

TABLE 7. *Residential accommodation for the treatment of tuberculosis approved by April 1, 1929*

Sanatoria and hospitals	*Institutions*		*Beds*	
	Local authorities	*Voluntary bodies*	*Local authorities*	*Voluntary bodies*
A. *Institutions for pulmonary cases* (mainly or entirely)				
(*a*) sanatoria (including consumption hospitals) . .	143	56	10,957	4,257
(*b*) isolation hospitals (including small-pox hospitals) .	44	1	2,223	50
(*c*) children's institutions . .	12	11	631	807
B. *General Hospitals*				
Town	1	145	44	538
Country branches .	..	16	..	132
C. *Institutions for non-pulmonary cases* .				
(*a*) adults only .	3	6	242	211
(*b*) children only .	7	41	729	1,785
(*c*) adults and children . .	1	7	30	624
	211	283	14,856	8,404

the councils. (This has, in some districts, so far, unfortunately made little change either in the personnel of the bodies or their methods of administering relief.) Vaccination and infant life protection work (previously carried out by the guardians) were to be discharged as public health functions. All services which could be

performed legally by local authorities (such as provision of hospitals, tuberculosis, venereal diseases, maternity and child welfare, mental deficiency, and the welfare of the blind) should be carried out under these powers even for those on relief, thus dissociating them from the poor law.

County councils could now provide hospitals for the sick and appropriate for this purpose institutions transferred to them under the Act from guardians. Thus the unit of sanitary government was still further enlarged—'a far cry from the parishes'. This was further promoted (1) by imposing upon county councils the duty of making arrangements for the appointing by district councils of medical officers of health not engaged in private practice; (2) by requiring county councils to provide adequate hospital accommodation for infectious diseases; (3) by providing machinery for the transfer to county councils of maternity and child welfare services in areas where they are authorities for elementary education; and (4) by replacing the percentage grants of the State in connexion with tuberculosis, venereal diseases, &c., by a 'block grant' (depending upon the population, and modified by such factors as the number of unemployed, the proportion of children, and the mileage of main roads) for a period of years. The latter change gave the local authorities more freedom of action and enabled them to provide financial assistance to local sanitary authorities in respect of sanitary works and public medical services.

In order to avoid overlapping, local authorities were advised to consult with voluntary hospitals in contemplating hospital provision.

Finally, the optional power by local authorities of

recovering from patients the cost of treatment (Public Health Act, 1875, section 131) was now changed, by section 16 of the Local Government Act, into a *duty* to recover the cost in full, unless the authorities were satisfied that the persons could not reasonably pay. This seemed necessary, as it was expected that the larger variety of hospital treatment offered by the councils would result in correspondingly greater demands on the services. The proviso was not made to apply to infectious diseases (and therefore to tuberculosis), as the treatment of these diseases concerns the community as a whole.

How did the Act affect the administration of tuberculosis? Until 1929, in spite of the development of the tuberculosis schemes and the increase in the number of beds, a considerable proportion of tuberculous people still had to be dealt with by the poor law, since according to the National Health Insurance Act, 1911, it was illegal for insurance committees to use poor law institutions. As a result of the appropriation of institutions under the poor law following the Act of 1929, the medical officers of health of county and county borough councils were now able to consider using the hospitals taken over, for the treatment of tuberculosis. In particular these beds could be used for those patients for whom accommodation was otherwise inadequate: advanced cases and those with both pulmonary and non-pulmonary lesions. Tuberculous persons previously treated under the poor law could now be treated under the local authority without the stigma of pauperism and with better facilities in regard to dispensary supervision, &c. Before, patients in poor-law institutions who required sanatorium treatment had found it difficult to obtain

it unless some co-operation with the appropriate tuberculosis officer had been developed, a co-operation which the Local Government Board had attempted to encourage for some years.

The full possibilities of the Local Government Act, 1929, are, however, not represented by what has been stated. These will be discussed in the last part of this book.

The last administrative measures to be mentioned are the Public Health (Tuberculosis) Regulations, 1930, which consolidated the previous regulations of 1912, 1921, and 1924 (and in particular made clear the necessity for re-notifying if a patient moved to another district), and the Local Government (Qualification of Medical Officers and Health Visitors) Regulations, 1930, which fixed the qualifications and experience to be required by local authorities from persons appointed as tuberculosis officer, medical superintendent of a sanatorium, and tuberculosis visitor. In regard to each of the former two it was stipulated that subsequent to qualification, he must have (1) had at least 3 years' experience in the practice of his profession; (2) spent in general clinical work a period of not less than 18 months, of which not less than 6 months must have been spent in a hospital as resident officer in charge of beds occupied by general medical or surgical cases; and (3) received special training of not less than 6 months, in the diagnosis and treatment of tuberculosis. Tuberculosis visitors must have obtained a health visitor's certificate or an equivalent diploma, or be fully trained nurses and have had at least three months' special experience at a sanatorium or hospital for the treatment of tuberculosis, or at a tuberculosis dispensary. Thus,

while in the past the Ministry approved each individual appointment, now a duty was placed upon the local authorities of ensuring that persons chosen by them had the necessary qualifications. The Ministry reserved the right to permit any departures from these requirements.

TABLE 8. *England and Wales: new cases*

Year	*New cases of tuberculosis*		
	Pulmonary	*Non-pulmonary*	*All forms*
1923	59,172	20,216	79,388
1924	60,747	20,411	81,158
1925	60,770	20,667	81,437
1926	59,520	20,134	79,654
1927	58,109	19,781	77,890
1928	57,682	20,199	77,881
1929	57,274	18,682	75,956
1930	54,331	18,670	73,001
1931	54,596	18,378	72,974
1932	51,836	17,956	69,792
1933	49,958	16,393	66,351
1934	48,208	16,022	64,230

With this we may close the account of the development of the control of tuberculosis initiated in 1908. It should be added that during this period various methods of diagnosis and treatment have developed, such as radiology, artificial pneumothorax, after-care, village settlements, rehousing schemes, &c. The full range of the tuberculosis schemes as existing at present will, however, be discussed in detail later. To end this section, figures representing the work of the tuberculosis schemes for 1934 are given. It will be interesting to compare them with those at various periods in the past (see above).

TABLE 9. *England: work done by the dispensary service in 1934*

New cases examined for first time	90,384
Contacts examined for first time	48,239
Total:	138,623
New cases and contacts diagnosed to be tuberculous:	
Pulmonary—adults	29,151
children	3,214
Non-pulmonary—adults	3,744
children	5,123
Total:	41,232
Contacts diagnosed to be tuberculous	3,374
Removed from dispensary registers as:	
Non-tuberculous	97,866
Recovered	13,724
Dead (all cases)	19,950
'Recovered' cases restored to registers	504
Cases on dispensary registers on Dec. 31:	
Pulmonary—adults	116,141
children	20,183
Non-pulmonary—adults	20,799
children	28,665
Diagnosis not yet completed	11,026
Total:	196,814
Pulmonary cases on registers which were sputum-positive	64,302
Sputum examinations	112,455
X-ray examinations	84,195
Consultations (personal)	19,411
Home visits by tuberculosis officers (including personal consultations)	79,485
Home visits by nurses or health visitors	782,208
Attendances at dispensaries	785,190

TABLE 10. *England: provision made for the diagnosis and treatment of tuberculosis at public cost (December 31, 1934)*

Number of dispensaries approved by the Minister	464
Number of beds provided by:	
Local authorities in	
Sanatoria and special institutions	14,896
Isolation, including small-pox hospitals	1,822
General hospitals	2,519
Total:	19,237
Voluntary organizations in approved institutions	
Sanatoria and special institutions	7,436
Isolation hospitals	52
General hospitals	638
Total:	8,126
Grand Total:	27,363
Beds provided in poor law institutions and hospitals	2,208

TABLE 11. *England: summary of use made of residential institutions during the year 1934*

	Admitted	*Discharged*	*Died*	*In residence Dec. 31*
In public health and approved institutions:				
For observation .	5,513	5,934	118	881
For treatment of pulmonary tuberculosis .	37,922	30,858	6,647	16,325
For treatment of non-pulmonary tuberculosis .	8,250	7,672	650	5,647
Total . .	46,172	38,530	7,297	21,972
In poor law institutions and hospitals:				
For treatment of pulmonary tuberculosis .	5,589	3,511	1,945	1,343
For treatment of non-pulmonary tuberculosis .	1,538	1,185	415	605
Total . .	7,127	4,696	2,360	1,948
Grand Total .	58,812	49,160	9,775	24,801

XIII

PREVENTION

From the knowledge of the causation of tuberculosis it is obvious that all measures taken to detect tuberculosis (especially the pulmonary form) and treat it adequately *ipso facto* act as prevention of the disease in the community at large. Hence, many of the administrative measures discussed already may be cited also as measures of prevention, particularly those providing for the examination of contacts, institutional treatment, and segregation of advanced cases in hospitals. Two provisions already quoted have, however, a purely preventive aspect: the compulsory segregation in certain circumstances of advanced pulmonary cases (Public Health Act, 1925, section 62), and the power to forbid an infectious person from handling milk (Public Health [Prevention of Tuberculosis] Regulations, 1925). Much legislation has in addition been passed since 1908 in connexion with the prevention in man of tuberculosis of bovine origin, and this will now be briefly summarized.

The Milk and Dairies Act, 1914, based on the knowledge of the injurious nature of tuberculous milk, regulated the production, sale, and distribution of supplies. The sale of tuberculous milk was prohibited, and local authorities were given powers to take samples, and in the interval to stop the sale of milk believed to contain tubercle bacilli. Veterinary surgeons could be appointed by local authorities, who were also to be permitted to set up milk depots for the sale at less than cost price of milk for infants under two years of age—a measure intended for the benefit of the poor.

Unfortunately, owing to the War, the operation of the Act was suspended, and its provisions did not really come into full operation until more than ten years later.

In the meantime, the Tuberculosis Orders, 1913 and 1914, provided for the destruction of every cow suffering from tuberculosis of the udder, giving tuberculous milk, or suffering from tuberculosis with emaciation; any person having a cow suffering from any of the above conditions must give notice to the local authority, who must have at its disposal the services of a veterinary surgeon. Compensation was paid for animals slaughtered.

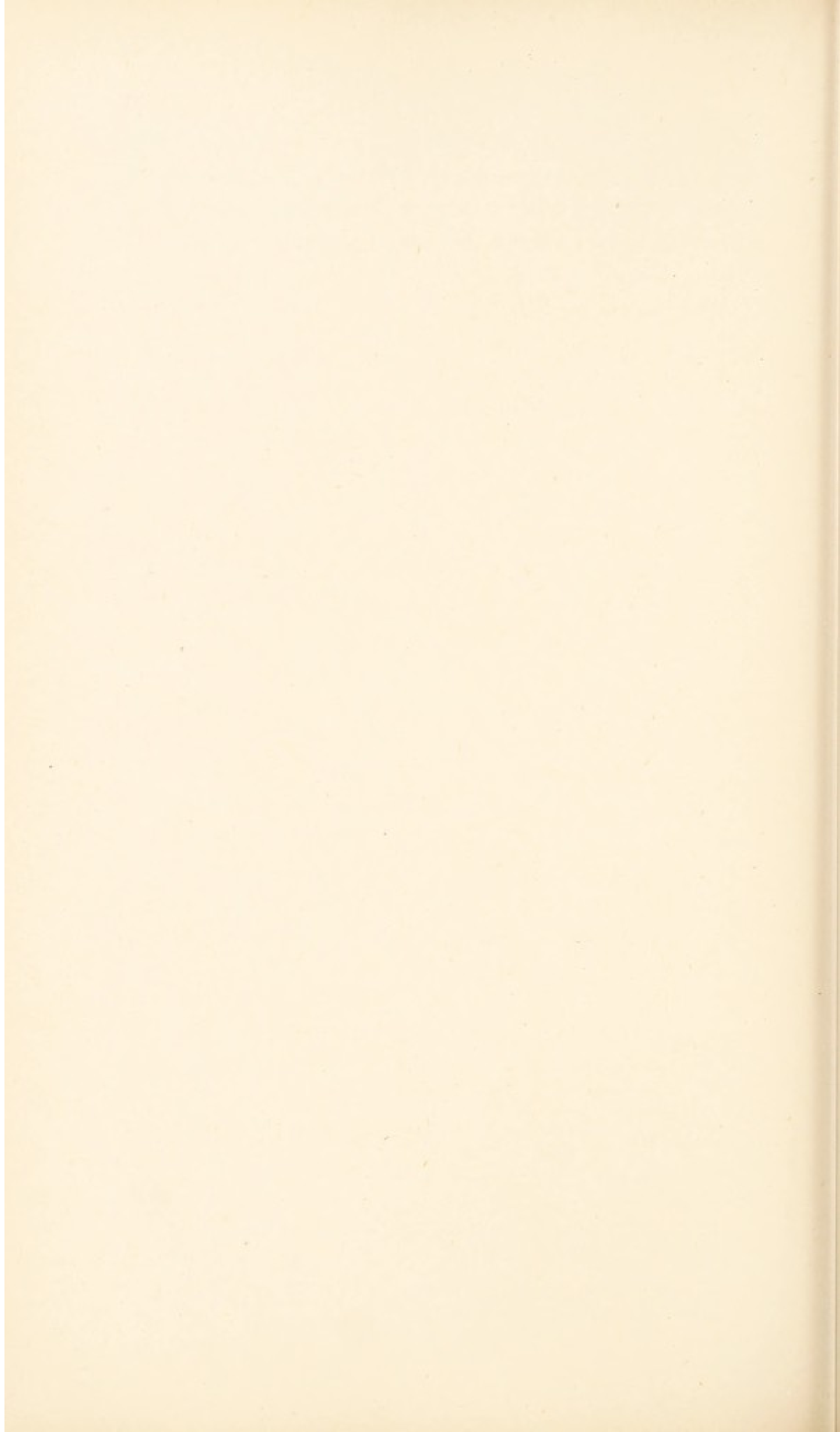
In 1915, the registration of dairymen as well as of premises, and the supervision of the interior of dairies and the handling, cooling, and conveyance of milk were to be enforced, and 'designations' of milk authorized (Milk and Dairies [Consolidation] Act, 1915); but this was also postponed until after the termination of the War.

After the War, the Milk and Dairies (Amendment) Act, 1922, followed. Local authorities could now refuse registration of milk purveyors, and the grading of milk ('certified', 'grade A', 'pasteurized'), which came into operation by an order of the Ministry of Health in 1921, was now given the authority of Parliament.

The Tuberculosis Order, 1925, made further provisions with regard to tuberculosis or suspected tuberculosis in cattle and their inspection and slaughter. Finally, the Milk and Dairies Order, 1926, consolidated the whole of the provisions of previous Orders under the Milk and Dairies Act.

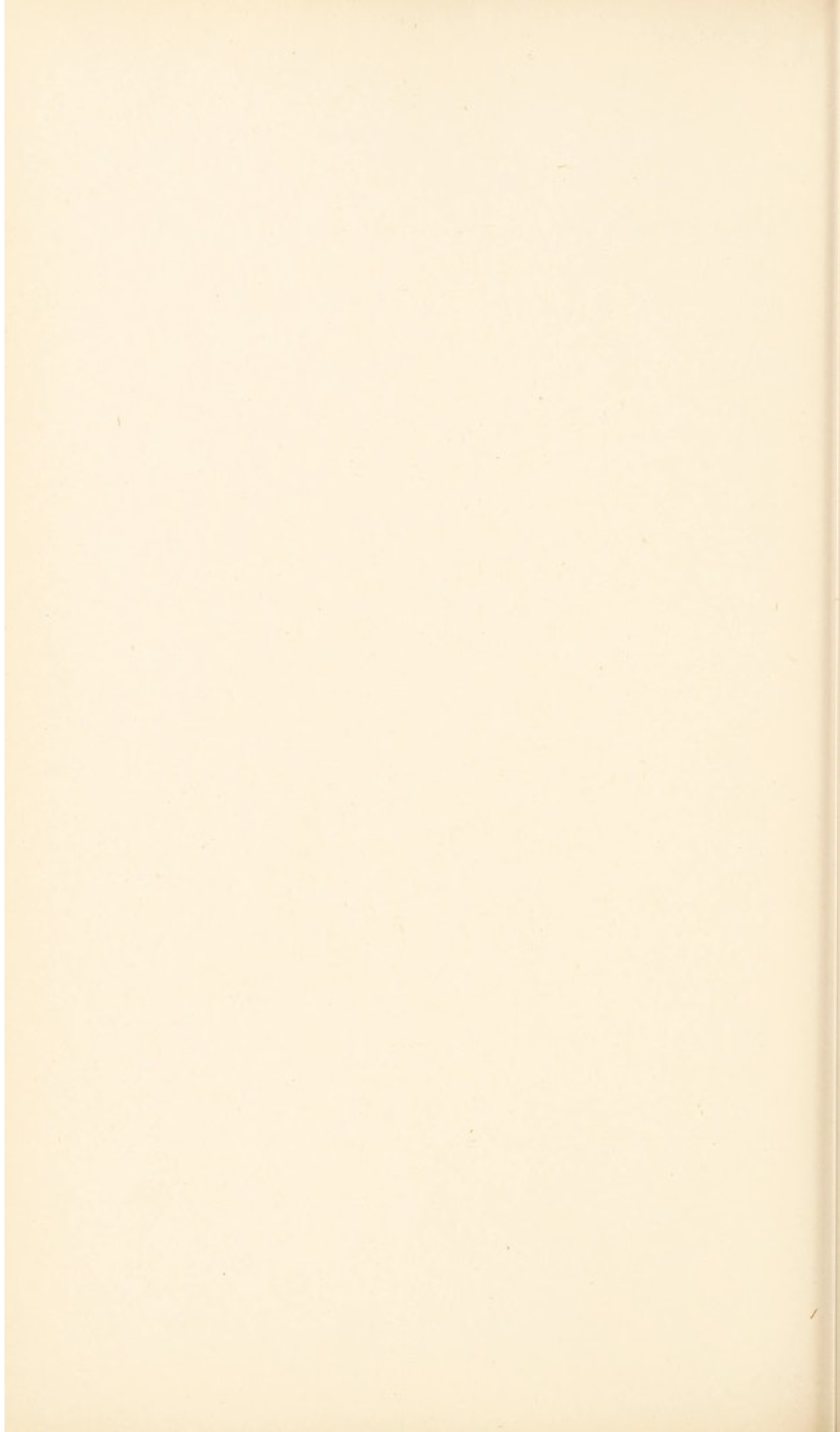
The control of tuberculosis of bovine origin has been

for some years now a subject for wide discussion in this country, and considerable dissatisfaction with the present state of affairs is still freely expressed. The subject will be further discussed later.



PART III

THE PROBLEM OF TUBERCULOSIS TO-DAY



XIV

INCIDENCE OF TUBERCULOSIS SINCE 1900

To review the adequacy and efficiency of the tuberculosis schemes and be in a position to suggest improvements, it is essential to have some knowledge of the incidence of tuberculosis at the present time and of the recent advances made in regard to the aetiology and treatment of the disease.

Since 1900 there has occurred a further decline, not only in the mortality of tuberculosis (see tables 12 and 13), but also in the ratio of the tuberculosis mortality to that due to all causes (table 14).

TABLE 12. *England and Wales: mortality from tuberculosis*

	No. of deaths		*Standardized death-rate per million*	
	1901	*1934*	*1901*	*1934*
Pulmonary . .	41,224	25,682	1,263	586
Non-pulmonary .	17,706	5,200	544	154
	58,930	30,882	1,807	740

TABLE 13. *England and Wales: decline of tuberculosis mortality*

	Year	*Mortality per 100,000 population*
Pulmonary . . .	1901 1934	126 58
	Decline	54 %
Non-pulmonary . . .	1901 1934	54 15
	Decline	72 %

TABLE 14. *England and Wales: ratio of deaths from tuberculosis (all forms) to deaths from all causes*

	Males	*Females*
1901–10	11·4	10·2
1921–25	9·5	8·3
1926–29	8·5	7·1
1930–33	7·8	6·5
1934	7·1	5·7

Mortality in Relation to Sex and Age

In the age-period 5 to 45 years tuberculosis is, at present, the chief killing disease in England and Wales, owing to the low general mortality at these ages. Towards the end of childhood and young adult life the mortality is greater among females than males. In this age-period one-third of the deaths from all causes among males, and almost one-half of all deaths among females, are due to tuberculosis, chiefly the pulmonary form. In middle life and old age the mortality from tuberculosis is much greater among males than females (see table 15).

Dr. J. E. Chapman, of the Ministry of Health, made a few years ago a special study of the decline in the tuberculosis mortality and found that the decline was taking place at different rates at different ages, and that different forms of tuberculosis were responsible at different ages for this decline. A disturbing fact was noted: among young women (that is, in the 15 to 30 years period), the decline had apparently ceased. This may be illustrated by table 16, which gives the mortality from pulmonary tuberculosis per 100,000 of the population at the age-period 20–25 years. (A definite fall in the female mortality has, however, apparently again occurred during the past year.)

TABLE 15. *England and Wales: deaths from all causes and from tuberculosis which occurred in the year 1934, by sex and age*

(The 'percentage due to tuberculosis' for 1929 is included for comparison.)

Age	*Deaths: males*				*Deaths: females*			
	All causes (1934)	*Tuber-culosis* (1934)	*% due to tub.* (1934)	*% due to tub.* (1929)	*All causes* (1934)	*Tuber-culosis* (1934)	*% due to tub.* (1934)	*% due to tub.* (1929)
0–5	28,175	935	3·3	3·6	22,120	786	3·5	3·5
5–15	6,438	672	10·4	13·1	6,083	763	12·5	16·5
15–25	8,732	2,744	31·4	33·4	7,886	3,606	45·7	46·7
25–35	10,554	3,426	32·4	33·2	10,459	3,390	32·4	33·8
35–45	13,193	2,967	22·4	23·5	12,493	2,018	16·1	17·2
45–55	25,241	3,369	13·3	14·1	20,623	1,400	6·7	7·2
55–65	43,492	2,329	5·3	5·6	34,616	892	2·5	2·9
65 & over	107,030	1,006	0·9	0·9	119,675	579	0·4	0·5
All ages	242,855	17,448	7·1	7·9	233,955	13,434	5·7	6·4

If the pulmonary tuberculosis mortality curves are studied, it is noted that they show three peaks at three age-periods (20–25 in females and 25–30 in males, 45–50 in males and somewhat earlier in females,

TABLE 16. *Mortality from pulmonary tuberculosis per 100,000 of the population (age-period 20–25)*

	Males	*Females*
1861–70	389	397
1871–80	311	315
1881–90	234	233
1891–1900	189	159
1901	167	129
1906	148	129
1911	139	125
1916	136	140
1921	136	141
1926	109	131
1929	107	134
1934	95	113

and 60–65 in both sexes). Brownlee (1918) in his detailed study therefore classified pulmonary tuberculosis into 'young adult type', 'middle-age type', and 'old-age type'. In table 17 (MacNalty, 1932) has compared the behaviour of these three types before and after 1901.

TABLE 17

Pulmonary tuberculosis	*1851–60 to 1901*	*1901–29*
In young adult life.	Rate of decline greater in both sexes than in middle age, and greater in females than in males.	Rate of decline in males, after recovery from the effect of the war period, apparently continuing high, except at ages 15–20. Decline in the female rate has ceased at ages 15–30.
In middle age.	Rate of decline less marked in males than in females, and less marked in both sexes than among young adults.	Rate of decline markedly increased in both sexes, and more so among females than among males.
In old age.	Rate of decline greater among females than among males, and greater among males at this age than in middle age.	Rate of decline increased, especially among males.

The decline in the mortality in young women practically ceased soon after 1900, and except for a temporary increase during the War, has remained the same (but 1934 again shows a fall). MacNalty (1932) suggests that this is 'associated with the changes of life led by young women which have occurred since

the closing years of the last century, associated as these changes are with a more strenuous life generally'. He considers that 'the problem of the mortality from tuberculosis of the young adult, especially among females, is becoming increasingly important in this country and in some districts, especially in the north of England, more so than in others'. It would appear, however, from the figures given for 1934, that a less gloomy view may shortly be justified.

Mortality in Children

Table 18 gives at various age-periods in children the death-rates from all causes and from tuberculosis, and the respective mortalities in 1934 expressed as a percentage of the mortality in 1911–15. It will be noted that there has occurred a gradual fall in the death-rate, both from all causes and from tuberculosis at all ages. But the tuberculosis mortality has dropped considerably more than the general mortality at under 1 year, at 5–10 years, and at 10–15 years, but not at 1–5 years. As many of the infants infected in the first die in the second year of their life, the figures appear to indicate that the drop in tuberculosis mortality in children under 5 years is due to measures for improving the health in general, rather than to efforts directed against tuberculosis itself. This seems an important conclusion, and would justify more energetic adoption of preventive measures in young children, e.g. removal of contacts from home, immunization, &c.

It will be seen that tuberculosis still accounts for about 9 per cent. of all deaths at 1–10 years, and for 14 per cent. at 10–15 years.

The actual deaths from tuberculosis in 1934 are given in table 19.

TABLE 18. *England and Wales: death-rates in children*

		Per 1,000 live births	Per 1,000 living		
			1–5 yrs.	5–10 yrs.	10–15 yrs.
1911–15	All causes:	109·56	16·21	3·39	2·08
	Tuberculosis (all forms):	3·08	1·64	0·6	0·59
	% of tuberculosis to all causes:	*2·8*	*10·0*	*17·6*	*28·3*
1916–20	,,	89·94	14·58	3·81	2·48
		1·99	1·39	0·61	0·66
		2·2	*9·5*	*15·1*	*26·6*
1921–5	,,	76·05	10·29	2·48	1·71
		1·39	0·98	0·38	0·43
		1·8	*9·5*	*15·3*	*25·1*
1926–30	,,	67·88	8·58	2·37	1·58
		1·07	0·80	0·31	0·33
		1·5	*9·3*	*13·0*	*20·8*
1931	,,	66·35	7·52	2·14	1·47
		1·05	0·67	0·26	0·27
		1·5	*8·9*	*12·1*	*18·3*
1932	,,	65·04	6·94	2·07	1·39
		1·00	0·68	0·24	0·25
		1·5	*9·8*	*11·5*	*17·9*
1933	,,	63·68	6·56	2·19	1·43
		0·83	0·59	0·22	0·24
		1·3	*8·9*	*10·0*	*16·7*
1934	,,	58·59	6·59	2·43	1·42
		0·70	0·56	0·22	0·21
		1·2	*8·5*	*9·0*	*14·0*

Mortality in 1934 expressed as percentage of mortality in 1911–15:

	Under 1 yr.	*1–5 yrs.*	*5–10 yrs.*	*10–15 yrs.*
All causes . .	53	40	71	68
Tuberculosis (all forms) . .	22	34	36	35

TABLE 19. *England and Wales: deaths from tuberculosis (all forms), 1934*

Age	*Number of deaths*
Under 1 year	413
1–4 years	1,308
Total under 5 years	1,721
5–9 years	686
10–14 years	749
Total under 15 years	3,156

XV

RECENT ADVANCES IN KNOWLEDGE OF TUBERCULOSIS

In part I of this book the discussion of the knowledge of tuberculosis ceased at the year 1908. The 'advances' briefly summarized here will therefore be those which have taken place since that date.

Causation

Although the fact that the tubercle bacillus is the cause of the common clinical forms of tuberculosis has not been challenged, much experimental work has accumulated to indicate that the tubercle bacillus constitutes only one biological phase of the tubercle virus, which may show various forms—from filamentous organisms to particles which pass through coarse filters. But the relation of these phases to clinical types of tuberculosis has hardly been worked out, and the whole subject has not passed beyond the research stage. In France and elsewhere workers have even gone farther and have claimed that a definite filterable form of the virus exists which may be transmitted from mother to foetus, and is responsible for certain clinical conditions (including rheumatism), the cause of which has up to the present remained obscure. This work has been seriously criticized, and has not been confirmed by the foremost bacteriologists in this and other countries.

Work of more practicable value concerns the determination of the relative incidence of bovine and human sources as the cause of pulmonary and non-pulmonary forms of tuberculosis. The investigations of Stanley

Griffith and Blacklock in this country must be cited in particular. It has been shown that in pulmonary tuberculosis—the chief form in adults—the bovine bacillus is only very rarely found, but more recent work has demonstrated that in some parts of the country (e.g. in Scotland) this is not as rare as originally believed (as high as 17 per cent. in one district), particularly in communities which have much contact with cattle. The work of K. A. Jensen in Denmark has lent more emphasis to the above findings.

Among children under 15, on the other hand, it is estimated that 25 per cent. of the deaths from all forms of tuberculosis can be attributed to the bovine bacillus. In children the non-pulmonary form predominates. A common belief attributes the latter almost entirely to bovine sources, but investigations have shown that even in this form the human bacillus is more common than the bovine, although the relative incidence depends on the organ involved and the age of the child. The relative percentage of human and bovine sources of tuberculosis of children varies, however, with the district. Thus, the bovine bacillus assumes greater responsibility in those districts in which the milk consumption is greater and the measures taken to obtain tubercle-free milk are less developed. Hence, the human bacillus is found to preponderate in large towns, where much of the milk consumed is pasteurized, rather than in country districts. Finally, at a time when the bovine sources are attracting so much attention in this country, it is well to stress again the fact that 75 per cent. of the tuberculosis in children in this country is attributable to human sources.

Much controversy has raged round the question whether pulmonary tuberculosis in the adult is a recrudescence of childhood infection (endogenous) or a fresh (exogenous) infection, modified by an immunological state following first infection. The matter is still unsettled; that both may occur is unquestionable. Recent epidemiological studies of Opie and his collaborators (1935) in America bring forward fairly convincing evidence that an exogenous infection is the predominant cause of adult pulmonary tuberculosis. This, however, does not necessarily indicate that exogenous *re*infection is the principal mechanism, for tuberculin surveys are showing that an increasingly larger percentage of the population is reaching adolescence without having been previously infected. The finding of the American authors is nevertheless of the highest economic and social importance, as it indicates that the sputum-positive patient is highly infectious, not only to the child, but to the healthy adult.

The course of tuberculosis in childhood has been well worked out by German, French, and Scandinavian workers. It has been shown that the infecting organism from human sources lodges in the lung and produces a lesion which, with the corresponding affected hilar glands, constitutes the 'primary complex'. This is associated with a haematogenous spread, which may prove fatal, or be so discrete that only one, or no secondary lesion in other organs develops and recovery may take place. The investigations of Wallgren showing that meningitis occurs most commonly within the first six months after primary infection, and that later the probability of this sequel becomes less and less, is of great practical importance, as it emphasizes the

need for very early detection of primary infection in children.

Predisposing Factors

While it is generally admitted that true congenital tuberculosis is very rare, there is a growing opinion, particularly since the German work on twins (Diehl and von Verschuer, 1932[1]), that a predisposition to the development of *disease* and its subsequent course once infection has taken place may be inherited, and that post-natal infection and dosage will not alone account for the varying course adopted by tuberculosis. Although this may explain the rapid downhill course adopted by very 'early' cases in spite of all treatment, it is obvious that no means exist at present of distinguishing those so predisposed from others. It emphasizes, however, that every endeavour should be made to prevent *infection* in children (in whom alone this is practicable) as long as possible.

The economic factors associated with poverty and general hygienic factors have for long been considered as a predisposing cause of tuberculosis. The careful statistical inquiry by Bradbury carried out recently has given a scientific basis for this assumption. He has proved that poverty shows a marked statistical association with tuberculosis, that it is poverty which causes the tuberculosis rather than vice versa, and that this is due chiefly to the factors of overcrowding and undernourishment. He has also brought to light the important fact that the supervision exercised by maternity and child welfare clinics is definitely a factor in the suppression of tuberculosis.

[1] The conclusions formed by Diehl and von Verschuer have, however, been severely criticized by Redeker, and by Bruno Lange (*Ergebn. Hyg. Bakt.*, 1936, xviii, 123).

Diagnosis

Important advances have been made in methods to aid diagnosis.

An enormous amount of work on tuberculin tests has now become crystallized. It is generally admitted that the intracutaneous (Mantoux) test is the one to use, and recent work in America favours the employment of a 'purified protein product' rather than old tuberculin itself. At all ages a negative Mantoux test may for practical purposes be considered as excluding tuberculous infection. This fact is of little value in connexion with adults living in crowded communities, but since continental work has shown that a considerable number of adolescents, especially in rural districts, are Mantoux-negative, the help which may be derived from the use of the test, even in adults, is not to be disdained. In children the test is of great value; before the age of two years a positive reaction is most probably associated with an active lesion—the younger the child, the greater this probability—in older children while a positive test merely indicates infection (and therefore possibly only a healed focus) a negative test is of value in excluding infection. Moreover, it has been shown that after infection a period of a few weeks elapses before a test becomes positive—the anteallergic period. The importance of the above considerations in regard to child contact work cannot be over-emphasized.

The bacteriological examination of sputum has been rendered more precise by the use of concentration methods and by culture on Loewenstein's medium. The latter method not only enables positive results to be obtained in material (e.g. caseating glands, pleural

fluid) in which the search for tubercle bacilli by ordinary methods proves negative, but also in most cases makes it possible, by the use of K. A. Jensen's modification, to determine with fair accuracy from the appearance of the colonies, the type of bacillus isolated.

Much difficulty is often found in the bacteriological confirmation of pulmonary tuberculosis when the patient maintains that he has no sputum: in children, indeed, the absence of expectorated sputum is the rule. This is, however, generally due to the fact that the sputum is slight in amount and is swallowed. The new method of washing out the fasting stomach and searching for bacilli by cultural and guinea-pig inoculation methods enables many positive results to be obtained, not only in children (even during the primary infection) but also in adults. The method is now extensively used on the Continent in both children and adults. In England it has so far been practised only in a very few institutions for children. The importance of the method in providing a more accurate criterion of the effect of treatment and the contagiousness of a consumptive patient should be borne in mind.

Radiology of the chest has revolutionized the diagnosis and treatment of pulmonary tuberculosis. It has demonstrated that the early stage in the development of a tuberculous lesion, or its relapse, is almost symptomless, and therefore, that at this stage diagnosis can only be made by radiology, which is thus our most valuable weapon in contact examination. Radiology has emphasized the unreliability of physical signs; only by its means can an accurate opinion be formed of the extent of the lesion—of importance not only in regard to prognosis, but in deciding on the

treatment to adopt, particularly since the introduction of artificial pneumothorax and surgical methods. Radiology has *not* reached the stage at which the degree of activity of the lesion may be judged with any degree of accuracy, but it has demonstrated the existence of latent lesions which may recrudesce. Finally, radiology, especially in connexion with lipiodol injection, has made it possible to dissociate, and in practice diagnose, pulmonary tuberculosis from many non-tuberculous lesions (e.g. bronchiectasis) whose symptoms and physical signs not seldom led to an erroneous diagnosis of tuberculosis.

Prognosis

Little progress has been made in providing us with means by which the prognosis of an individual case of tuberculosis may be determined. I am referring, of course, to pulmonary tuberculosis alone. The course of surgical tuberculosis with adequate treatment is fairly well defined, as is the fatal issue of the generalized forms. Pulmonary tuberculosis, on the other hand, offers many surprises. The small lesion placed under ideal conditions of treatment may prove fatal within a few months, and the treated patient whose three or more lobes are involved may carry on a fairly comfortable life for years. *Serial* sedimentation-rate determinations are undoubtedly of some value in estimating the outlook in the more acute cases, and a similar claim has recently been made for certain blood examinations depending on the differential white count and relative number of the differently nucleated polymorphonuclear leucocytes.

An important analysis of over 8,000 patients treated at the Brompton Hospital Sanatorium, Frimley, must

be mentioned, as the conclusions are of great value. The authors (Hartley, Wingfield, and Burrows, 1935) found that the survival-rate of the patients treated there depended almost entirely on the stage of the disease and the degree of involvement of the lungs on admission, and was relatively unaffected by sex and age (children are not discussed here). The greatest danger to the patient existed in the first two years after leaving the institution; afterwards the prospect rapidly improved as time went on. The expectation of survival was much better in patients treated by artificial pneumothorax than in a control group, provided there was no disease in the contralateral lung. Finally, they conclude that the prospects of a patient have not altered much in the last thirty years unless he belongs to the category which permits of artificial pneumothorax treatment.

Treatment

The treatment of tuberculosis has undergone many changes in the last thirty years, although the more recent methods are not yet universally practised (or even universally known). In regard to non-pulmonary tuberculosis the introduction of ultra-violet light irradiation, and of conservative methods in the place of operative intervention for bone and joint disease, are the most conspicuous advances.

The principle of rest in the treatment of pulmonary tuberculosis introduced by Dettweiler was a salutary improvement on the exercise advocated by Bodington. The inadequately understood teachings of Marcus Paterson of twenty-five years ago led unfortunately to a return of unregulated and too early exercise, which must have had an injurious effect on the treatment

of the disease. A distinct swing of the pendulum is to be noted now, and it is being recognized that rest is the most important measure in the treatment of pulmonary tuberculosis, fresh air and diet assuming a minor role.

The artificial pneumothorax treatment of pulmonary tuberculosis, although first used in this country in 1910, was not practised to any extent till some years after the War. Its value in selected cases (and their number will increase as measures to detect cases in the early stages are developed) can no longer be disputed. Every one is agreed that it is indicated in cavernous cases, but there still exists a difference of opinion as to whether the induction of an artificial pneumothorax should be carried out in non-cavernous cases in whom a lengthy period of 'sanatorium treatment' may be equally effective. But the fact that an artificial pneumothorax may lead to considerable shortening of institutional treatment, enables patients to carry on with their work while under treatment, and is the most rapid method of rendering a patient non-contagious, definitely appears to favour its adoption even in the non-cavernous cases in the working classes. *But*, it is essential (1) that the principles and practice of the method should be thoroughly well understood; (2) that the method be constantly controlled by radiology; and (3) that facilities for adhesion-section, when an artificial pneumothorax is ineffective owing to adhesions, be available.

The value of the surgical methods that have developed in recent years (phrenic interruption, apicolysis, and the various types of thoracoplasty) as a form of treatment in a restricted number of cases can likewise no longer be doubted. Particularly suitable

for the chronic cavernous case (and not necessarily unilateral) in good general condition their value is even greater as a preventive measure, in that they allow of the closure of cavities and arrest of disease in those sputum-positive patients who, owing to their chronicity and general fair health, are of the longest potential danger to others, since segregation in institutions for very long periods is often impracticable.

The value of sanocrysin in the treatment of pulmonary tuberculosis is still being debated, although many reliable authorities have spoken in its favour. As our equipment for dealing with this disease is still so small, the neglect of the use of sanocrysin in certain patients cannot be justified.

Tuberculin as a form of treatment in pulmonary tuberculosis has now been discarded except by the very few. It is, however, stated to be of value in non-pulmonary cases.

The salt-restricted diet of Gerson, and the Herrmannsdorfer-Sauerbruch modification of it, have not been employed in this country in the treatment of pulmonary tuberculosis, and their value cannot be said to be established.

Prevention

The main principles in the prevention of tuberculosis remain unaltered. Evidence is accumulating which stresses the enormous risk run by children (especially infants) in contact in their homes with a sputum-positive person. And the recent work of Opie and his collaborators in America (1935) points to such people being a source of danger also to adolescents. The detection of early cases of tuberculosis, and the

adequate treatment of patients with 'open' tuberculosis, so as to render them sputumless or sputum-negative, must remain the sheet anchor of prevention. Two methods of prevention in children, which have originated in France and spread elsewhere, are the removal of healthy children from households in which a relative is suffering from tuberculosis, and BCG vaccination. A critical survey of the first method has recently been made by the author (1935 *a*), and there seems little doubt that, while this principle will need to be practised less and less as our methods of detecting and adequately hospitalizing and treating pulmonary tuberculosis develop, in the present state of the administrative control of tuberculosis the removal of non-infected children, and even of *healthy* infected young children, is called for not seldom as a life-saving measure. An excellent piece of work carried out in the last few years by Toussaint, Tuberculosis Officer of Bermondsey, emphatically demonstrates the need for this. In the last few years all cases of tuberculous meningitis in children certified in that district, whether dying at home or in hospital, were investigated in regard to a possible source of infection in the home. In only 54 out of 80 cases were all the possible contacts of each case persuaded to come up for examination (which included radiology), but in these 54 cases a sputum-positive person was traced in the homes of no less than 86 per cent. (It should be added that in a district where the milk consumed is not pasteurized to the extent it is in London, such a high percentage of human sources would not be obtained.)

In regard to BCG vaccination, which involves the use of an avirulent but living strain of the tubercle bacillus, it is discouraging that no attempt to practise

this method has been made in this country. It has no place in England as a general measure, but in certain circumstances its use (it is generally admitted that the vaccine is innocuous and produces at any rate a temporary slight immunity) may prove of value (Kayne, 1936). Where the living accommodation of a chronic consumptive is inadequate, and no further treatment for the patient is possible or is acceptable to him, if the parents consent to be separated from the baby for a short period only, vaccination with BCG during that period may tip the scale in a favourable direction for the child if infected later.

XVI

THE TUBERCULOSIS SCHEMES

The purpose of a complete tuberculosis scheme is threefold: (1) to prevent tuberculous disease (prevention of tuberculosis of bovine origin is often considered to be within the province of general public health work); (2) to detect tuberculous disease in as early a stage as possible; and (3) to treat and supervise all persons suffering from tuberculosis and secure 'arrest' of the disease within the shortest time possible. In examining the schemes to decide whether these objects are achieved, it will be logical first to discuss each component part of the scheme; Fig. 1 gives a diagrammatic representation of all the essentials of a complete tuberculosis scheme possible within the present administrative framework. The efficiency of the schemes as a whole will then be briefly reviewed. And, finally, in discussing the future, it will be of interest to speculate on how far the present administrative frame really meets the problem to-day.

Propaganda and Education

This important subject must, however, be discussed first. Sanitary authorities have been given considerable powers in regard to propaganda, and their work is supplemented by the voluntary organization known as the National Association for the Prevention of Tuberculosis. The neglect of this work on the part of local authorities is often deplored. But it appears to me that the utility of such propaganda has by no means been proved. Such propaganda is intended to be carried out direct to the public, and, as tuberculosis

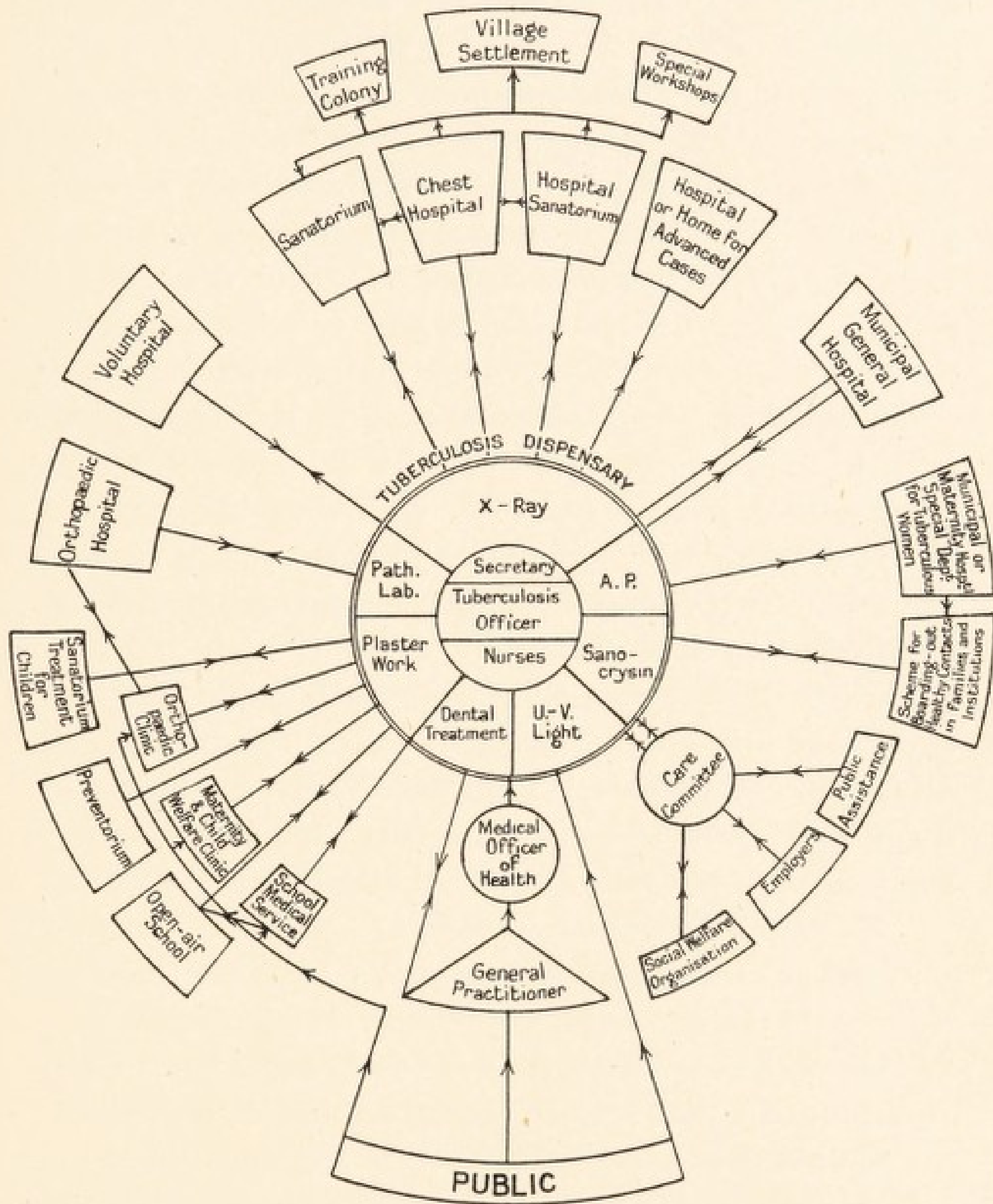


Fig. I. A Complete Tuberculosis Scheme

is so common in the poorer classes and its incidence is favoured by the conditions under which they live, it is directed to an uneducated section of the community. Leaflets are taken but are not often read, and posters are looked at once and soon forgotten. Lectures need to be very well arranged and delivered, and films attractively produced to ensure a large audience. How often is an enduring impression made? Moreover, it is important not to alarm the public, for a little knowledge may in this connexion indeed prove a dangerous thing. It would therefore appear preferable that propaganda should be restricted (and it will in fact thus be equally effective for our purpose) to general hygienic advice rather than to the subject of tuberculosis; and this applies also to schools. The education of the tuberculous patient is a different matter altogether.

On the other hand, 'specific' propaganda can and should be carried out in the various clinics of local authorities, by word of mouth from doctors and nurses, provided there is ample time to explain things fully and answer any questions which may be asked.

The man in the most favourable position for carrying out propaganda and for insuring attention is undoubtedly the general practitioner. It is indeed unfortunate that the private doctor is still considered as an agent for cure rather than one for advice on prevention —perhaps it seems unreasonable to pay for something which shows no results. Nor for that matter has the general practitioner, dealing with the class for whom propaganda is most needed, usually the time to carry out this important but unpaid work. Nevertheless, it is the only hopeful line of direct propaganda to the public. But in order that the general practitioner

should be in a position to carry out this propaganda he must not only possess an accurate knowledge of the principles of prevention and treatment of tuberculosis, but must also be fully aware of the facilities available for prevention and treatment. This can be achieved in two ways: (1) by sound teaching of tuberculosis to medical students, not by an expert clinician, but by an efficient tuberculosis officer, who will stress the preventive outlook and not the academic value of physical signs; (2) by personal contact between the general practitioners and the tuberculosis officer and medical officer of health. One or both of the latter should make a point of meeting every new practitioner in the district and inviting him to a demonstration of the dispensaries and institutions available for treatment; and over a cup of tea at the dispensary every year or so any improvements or interesting cases could be brought up in order to retain the interest of the practitioners.

In regard to the education of the tuberculous patient, it should be pointed out that such teaching must be done by persons who are intimately aware of the conditions under which the patients live. The home visits of tuberculosis officers (which are therefore essential) and those of health visitors ensure such knowledge. But this is by no means always so in regard to medical superintendents of institutions, who may take a more detached view of the patient's home environment; yet in describing the functions of sanatoria, 'education of the patient' is pointed to as one of prime importance!

The Patient and the General Practitioner

It is repeatedly emphasized in various quarters that in spite of propaganda and the efforts made by

the Ministry of Health to stress the importance of notification of tuberculosis (thus in 1923 a circular letter on this subject was sent to all medical practitioners), this important feature of the scheme is still unsatisfactorily administered. Cases are notified shortly, or only a few months before death, and sometimes not at all. Thus in 1928 out of 77,881 total fresh cases of tuberculosis coming to the knowledge of health authorities, information was not received until after the death of the patient with regard to no less than 4,252 or 5·5 per cent.—in 11·6 per cent. of the total deaths from tuberculosis. As the Chief Medical Officer of the Ministry points out (1928):

> 'Obviously, if a medical practitioner was in a position to certify that a death was due to tuberculosis, he must have made the diagnosis during the life of the patient and should have notified the case. In such cases a medical officer of health is entitled to enquire (and this procedure is one which should always be carried out) from the practitioner why the notification had not been made. The excuse often given is that the practitioner was under the belief that the case had been previously notified by somebody else; sometimes notification has been omitted from a mistaken idea that if a patient has been notified in one sanitary area, further notification is not required if the patient removes to another district. The Regulations, however, require notification unless the doctor has reason to believe that the case has already been notified in the area in which the patient is residing at the time.'

The second of these reasons is rendered even less valid now as, by the Public Health (Tuberculosis) Regulations, 1930, re-notification is required if the patient moves to another district.

Tuberculosis of the lungs is, as a rule, a chronic disease of several years' duration, and the large number of persons, even in institutions, who die within a few

months of coming under observation emphasizes the fact that persons suffering from phthisis, associated with definite symptoms, go about untreated for several months at least. Our present methods of treatment of pulmonary tuberculosis influence but little the course of advanced cases. Sanatorium treatment, artificial pneumothorax, sanocrysin, can generally achieve permanent results only in the localized unilateral lesions. These cases form unfortunately but a small proportion of the patients first coming under the care of the tuberculosis schemes. We must therefore ask ourselves two questions: (1) can early cases be detected by our present methods of investigation ? (2) If so, is the responsibility for the present state of affairs to be laid at the door of the patient or that of the general practitioner ? To the first question, if a small number of cases offering unusual difficulty are excluded, the answer is an unqualified 'yes'. Adequate and satisfactory radiology, the more precise bacteriological methods, and short periods of observation, enable localized unilateral disease to be detected with precision. Provided, therefore, the patient reaches a suitably qualified tuberculosis officer in an adequately equipped dispensary, the diagnosis should offer no great difficulty. The patient is, on the other hand, often blamed for not consulting the general practitioner sufficiently early. Two reasons for this are given: (1) the patient does not bother himself about the trifling symptoms which may be associated with early phthisis; or (2) suspecting the possibility of his suffering from tuberculosis, he is afraid to consult his doctor—the ostrich policy—because of the stigma attaching to the disease or because he or she cannot 'afford' to be ill: the working man who is

the sole supporter of his family will not risk losing his job or being away in an institution for any length of time; his wife cannot contemplate leaving the children uncared for. I feel that the first reason indicated above does not actually play an important role. Panel practice experience shows that the working classes do not delay unduly in consulting practitioners for such symptoms as cough, dyspepsia, fatigue, colds, &c., which are also the most common symptoms associated with the onset of pulmonary tuberculosis. Consequently, the second reason equally cannot play an important part. There is little reason why persons with such symptoms should suspect themselves to be suffering from phthisis, unless there is 'tuberculosis in the family'; for the type of propaganda which encourages the dissemination of the knowledge of the symptoms of pulmonary tuberculosis is not sufficiently widespread. (It may, incidentally, in view of the possible fear mentioned, prove a double-edged sword.)

Some blame must attach to the general practitioner, particularly after study of the case-histories of advanced tuberculous patients. Many have consulted their doctor several months before coming to the tuberculosis officer for symptoms suggesting the presence of pulmonary tuberculosis even at that time. Yet a sputum examination can be easily carried out under the schemes, or advice and a radiological examination at the appropriate dispensary obtained on simple request. Better tuberculosis teaching before qualification, and the bringing into touch of the doctors with an adequately equipped scheme would rectify this. But the position of the practitioner in regard to this problem is by no means an easy one. He is naturally loath to alarm his patient unnecessarily;

and the latter, if unintelligent, or unless the doctor displays much tact, may, if found non-tuberculous, change his doctor instead of expressing gratitude. If the doctor sent all the patients who show the symptoms indicated above to the dispensary for full investigation, a procedure which is in fact essential if we *are* to discover many more early cases, not only would the present tuberculosis schemes prove inadequate to the situation, but unless all the practitioners adopted this procedure, he would soon earn the reputation of an alarmist. At the present time we cannot, therefore, hope for a complete solution of this problem. But that an improvement on these lines is indeed overdue may be stressed by giving table 20, in which are shown, for the last four years, the total

TABLE 20. *Dispensary work in England*

	1931	*1932*	*1933*	*1934*
New cases examined for first time (excluding contacts)	97,364	95,000	92,878	90,384
Cases found tuberculous among the above number	37,596	40,777	39,155	37,858
Percentage	38%	43%	42%	42%

number of new patients (excluding contacts) examined for the first time in the dispensaries in England, and the number and percentage of them found tuberculous. The fact that as high a percentage as 38 to 43 are found tuberculous indicates that general practitioners by no means err on the safe side in sending patients up for consultation to the tuberculosis officers. Moreover, no improvement is to be noted since four years ago.

It should be pointed out that patients are sometimes reluctant to attend the tuberculosis dispensary when it is suggested to them by their doctor. The fears already discussed would, however, perhaps be allayed by the renaming of dispensaries, by making their atmosphere more 'homely', and by assuring the economic security of the family. The last two points will be discussed in further detail later. As regards 'naming', it might be pointed out that abroad the word 'tuberculosis' is avoided as far as possible. It has been suggested that 'chest clinic' would be less likely to deter the patient from attending (in East Ham this name has indeed been adopted). I believe that the conclusion arrived at as a result of a questionnaire sent out by the London County Council was that it would be advisable to leave matters as they are at present. The opinion has been expressed that 'chest clinic' might attract 'all the bronchitics' under a false impression. To me this result would appear to be all to the good, as it would enable the detection of many cases of masked tuberculosis. It should be a simple matter to convince the patient that the clinic was not a centre for treatment.

Two other points require stressing here. The discovery of a case 'early' in time does not necessarily imply a good prognosis, as, at present, an uncontrollable factor plays a role in producing a rapidly fatal termination in some of these cases in spite of all treatment. The second point which is being impressed more and more upon tuberculosis workers recently, is that in many persons pulmonary tuberculosis has at first a symptomless stage. The procedures discussed here do not cater for the detection of this stage. We can only hope to detect the latter in two ways: (1)

by the routine radiological examination of *all* contacts (in whom the disease is likely to be more frequent than in the rest of the population). This is practicable and there is no longer any excuse for its neglect. (2) The periodic radiological examination of the whole population. At present this must be considered an utopian ideal. It could, however, be brought within sight of practical limits by confining the examination to students, nurses, employees of industrial concerns, &c.; and this procedure is indeed being carried out in several countries with fruitful results.

Finally, attention may be drawn to the difficulty in which the tuberculosis officer, anxious to gain the confidence and obtain the support of the general practitioners, finds himself, when patients attend the dispensary of their own accord. The panel patient dissatisfied with his doctor dislikes returning to the latter for a 'letter'. If a large number of uninsured patients are seen, the general practitioners of the district may well think that they have been deprived of what is their due—the fees of those among the patients who could afford it.

The Medical Officer of Health

Little need be said in this connexion except to point out that, as the medical officer of health is the chief administrative officer for tuberculosis, it would be helpful, if, in order to have a more intelligent insight into the working of the scheme and give the right kind of encouragement to the tuberculosis officer and other tuberculosis workers, he had at least some working experience of the disease. While at least six months special experience in tuberculosis is considered an essential qualification for the holders of posts of

tuberculosis officer or medical superintendent of a sanatorium, this is not a compulsory qualification for medical officers of health.

The Tuberculosis Dispensary

The tuberculosis dispensary is regarded as 'the centre and pivot' of the tuberculosis scheme, and 'its tentacles closely embrace every general measure of preventive medicine as well as all the particular measures for combating tuberculosis'. According to the report of the departmental committee of 1912 its functions are:

1. Receiving house and centre of diagnosis.
2. Clearing house and centre for observation.
3. Centre for curative treatment.
4. Centre for examination of 'contacts'.
5. Centre for 'after-care'.
6. Information bureau and educational centre.

If the dispensary is to perform all these functions adequately, certain desiderata are essential, and these may be briefly discussed under the headings of situation, building and equipment, staff, and work.

The SITUATION of the dispensary is of importance. It should be convenient of access to the class of population for whom it is intended to cater. One dispensary is generally considered sufficient for a population of 150,000 (departmental committee)—a definition insufficiently elastic, as the provision should clearly depend also on the social and economic status of the population and the incidence of tuberculosis in the district. The situation will offer no difficulty in county boroughs, but this may be otherwise in country districts. In scattered areas the multiplication of dispensaries, which as a result are often represented by

small converted buildings or rented rooms where the tuberculosis officer attends once or more a month, is unsatisfactory, for these cannot provide the full equipment necessary. Moreover, it is important that the dispensary should be in close liaison with a general hospital to enable further investigation to be carried out, or a second opinion to be obtained in difficult cases, and where patients may be admitted for a short period of observation. The practice of having dispensaries actually attached to voluntary general or chest hospitals, as in several instances in London, has much to recommend it, and in the future such provision might be carried out extensively by establishing the dispensaries in connexion with municipal hospitals. This procedure is now rendered possible and was indeed foreseen by the passing of the Local Government Act of 1929. It could also be carried out even in country districts, as the rapid development of motor transport in recent years no longer renders the multiplication of dispensaries so essential.

The BUILDING itself should be designed on ample lines, with plenty of waiting room, adequate consulting and dressing rooms, and accommodation for the special work which may be necessary, such as radiology, artificial pneumothorax treatment, &c. Moreover, the need for future expansion should be borne in mind. The development of a homely atmosphere should be encouraged, particularly in regard to the waiting and consulting rooms. Simple and serviceable but attractive tables and chairs and a few flowers can with advantage replace the long wooden benches and dark bare walls often seen at present; and the consulting room should approximate as far as possible

to the more comfortable type of private practitioner's consulting room.

The dispensary should have its own radiological apparatus. The common practice of referring patients to a hospital for radiological examination has several disadvantages. (1) It tends to reduce the number of these examinations in patients in whom it is not *absolutely* necessary, owing to the cost and bother involved. (2) The obtaining of radiologists' reports discourages the tuberculosis officer from exercising his own judgement in the interpretation of films and prevents him from developing experience and interest in this work. (3) It causes delay in arriving at a diagnosis, and therefore, a delay in placing the patient under treatment, and displeases the practitioner who is anxious to have the tuberculosis officer's decision at as early a date as possible. (4) It prevents the carrying out of refills in ambulant patients at the dispensary.

Facilities for carrying out artificial pneumothorax at the dispensary should be available. This gives less bother to the patient and enables the same medical officer to supervise the patient and his treatment.

It is very advantageous to have attached a small pathological laboratory, where sputum examinations, sedimentation tests, and any other simple investigations can be carried out. Here too, there is saving of time. There may be some difficulty as regards the staffing, but the appointment of a full-time technician or a specially trained nurse (who would also carry out tuberculin tests) offers a suitable solution.

Non-pulmonary cases must not be forgotten, and unless adequate facilities for their treatment exist in connexion with a general hospital, provision should

be made for plaster work and for the administration of ultra-violet light.

Finally, where the dispensary caters for a large population, it may be found convenient to have the necessary dental treatment also carried out on the premises.

The TUBERCULOSIS OFFICER. The qualifications which are required by the Ministry for practitioners holding this post have already been indicated. The responsible and varied work which should be carried out by this officer in a fully equipped dispensary demands much more than the above basic requirements. A sound post-graduate training in general medicine is essential. The benefit derived from this will, however, not persist unless the officer keeps in contact with general medical and surgical work. The arrangement by which a dispensary is attached to the municipal hospital should also enable the tuberculosis officer to obtain the necessary general medical experience as assistant physician or clinical assistant. Whatever his previous tuberculosis experience, it should be kept up to date by periodic post-graduate work, and local authorities should, in the interest of the schemes, not only encourage such work but make it a condition of appointment. What is perhaps most important is that the officer should have largely a preventive outlook—the most brilliant clinician may make a very poor tuberculosis officer.

The personality of the tuberculosis officer plays an important role not only in regard to the patients, whose fate may well depend upon the manner in which he has talked to, and impressed them before they begin treatment, but also in regard to the general practitioners whose co-operation is so essential. He

must inspire confidence and make them feel that he is of definite help to them. Patients should always be investigated as fully as possible, a diagnosis arrived at at the earliest date, and the communications sent to the practitioners should be detailed and, in addition to diagnosis, offer advice and any necessary lines of treatment. Finally, the practitioner should not be made to feel that he has referred a patient unnecessarily.

The relations between tuberculosis officers and patients and the work of the former would be much improved if it became the practice of all officers to make themselves at least superficially familiar, by a personal visit, with all the institutions to which they may refer patients, and to make periodic visits to the institutions in which their patients are under treatment. Of most importance are the visits of the tuberculosis officer to the homes of patients in order to familiarize himself with their living conditions. Knowledge of these is of value not only in the treatment of the patient, but in regard to the preventive measures to be adopted for the family.

MacNalty (1932) points out the difficulty in obtaining adequately qualified men for the post of tuberculosis officer. When the tuberculosis schemes were established, a relatively large number of these officers were required within a short period and the demand for suitably trained people exceeded the supply. Moreover, there had perhaps been a tendency to regard a tuberculosis post as a means of obtaining light 'office-work' or a pleasant life in the country. At present the conditions are still not such as to attract the first-class man. The inadequate schemes or badly equipped dispensaries will discourage some, the low salaries others (since only a few can hope to achieve the well-

paid senior posts). The vicious circle thus established will be found difficult to break within the present framework of the schemes.

Alternative arrangements exist by which the same officer may also be superintendent of a sanatorium or carry out other public health duties, such as venereal diseases, or school or maternity and child welfare work. While good results may be obtained in this way sometimes, it is not practicable as a universal method.

The HEALTH VISITING and NURSING STAFF play an essential role in dispensary work, and the poorer the district the more important are their functions. They visit the homes after notification and obtain information as regards environmental conditions of the patient and as regards contacts; and they carry out follow-up and after-care work. Finally, they assist the tuberculosis officer at dispensary sessions, and may be employed to give actual nursing attention to patients in their homes. Their personality is of importance; and if they establish the right kind of contact they may exert considerable influence in getting patients to accept treatment, and in persuading contacts to come up for examination. They may become valuable agents for propaganda and for the education of the tuberculous patient in prophylactic measures in the home. In order to enlarge their sphere of action in this way and to reduce the number of persons visiting for various public health purposes, 'polyvalence' of health visitors is to be encouraged, i.e. the same person carries out over a limited district all the health visiting duties, e.g. school, maternity and child welfare, and tuberculosis.

The WORK of the dispensary as summarized by the departmental committee has already been indicated.

The establishing of a diagnosis, the recommendation of patients to appropriate institutions, and their supervision after they have returned home, may be termed the curative functions. It has been persistently stressed by the Ministry that the dispensary must not come to resemble the out-patient department of a hospital. The prescribing of medicines should be reduced to a minimum, and all definitely diagnosed cases of tuberculosis should be referred to their own medical attendant for domiciliary treatment, except (*a*) those who require immediate treatment in an institution, (*b*) those who require some special form of treatment which can be given most conveniently and efficiently at or in connexion with the dispensary (e.g. artificial pneumothorax, sanocrysin), (*c*) those non-insured persons who cannot afford to or for some other sufficient reason will not go to a private medical practitioner (MacNalty, 1932). This proviso does not do away with the periodic supervision of patients still kept on the register of the dispensary (until they can be removed as 'recovered' —not less than five years after coming under treatment), which should be carried out by reports from, or by consultations with, the general practitioner, or by seeing the patients at intervals.

The preventive aspect of the work of the dispensary has unfortunately been much neglected. In spite of repeated stressing of the importance of contact examination and the evidence brought forward to show the fruitful results of such a procedure (MacNalty [1932] writes an excellent chapter on this), this work is still inefficiently carried out or not at all (see table 21).

MacNalty (1932) states:

'particular stress has been laid on the importance of contact examination, partly because its importance has not been fully

realised by many tuberculosis officers and partly because medical officers of the Ministry have found on their visits to certain areas that this aspect of the work is being neglected. Thus Dr. Williamson found that out of a total of 872 contacts

TABLE 21. *England and Wales: work done in dispensary service*

	1931	*1932*	*1933*	*1934*
New cases diagnosed to be tuberculous (excluding contacts) . . .	37,596	40,777	39,155	37,858
Contacts examined for first time . . .	46,668	48,531	47,970	48,239

examined in one county area during 1928, eight of the tuberculosis officers had examined fewer than 12 apiece, i.e., less than one a month. Three of them had examined fewer than six contacts apiece in the whole twelve months, and one of them had examined only one during the year.'

And finally:

'It is the best method of detecting the incipient and early case of tuberculosis, the case which responds most favourably to sanatorium treatment.'

This is not the place to enter into a discussion of the most efficient method of examining contacts, but it must be stressed that the best results cannot possibly be achieved without the routine use of radiology and (in children) of the Mantoux test.

Care and After-care Organization

This highly important subject is discussed at this stage, because it is—or should be—intimately associated with the dispensary, and because the work of 'care' becomes necessary as soon as the patient is diagnosed as tuberculous. The term 'after-care'

should be abolished: not only because the work of the appropriate organization or committee should begin before the patient enters an institution and be continuous throughout the period after he leaves it, but because its use implies that 'treatment' ends on leaving the institution.

Soon after the introduction of 'sanatorium treatment' it was realized that in the poor the treatment presented difficulties from the economic aspect and because of the injurious influence of environmental conditions on the disease. Thus, difficulty was experienced in persuading patients to avail themselves of lengthy institutional treatment even if it was provided free: the mother of a family would have no one to look after the children in her absence; the married man would lose his job and be unable to make adequate provision for his family. And the loss of the job would also be serious for the unmarried young man or woman. Also, however good the immediate results of institutional treatment, relapse frequently occurred as a result of the inadequate economic situation of the patient and his family, which was most often due to loss of the original job and difficulty in finding another because of the reduced physical capacity or the stigma attaching to the disease. It was obvious, therefore, that (although care work could not very well be carried out by the ordinary dispensary staff) some organization working side by side with the dispensary was needed to solve this problem. The departmental committee stressed the importance of this work and considered it an essential part of a tuberculosis scheme. The functions of a care organization are stated by MacNalty as follows: (1) *Helping the patient to take advantage of institutional treatment.* The bread-winner may

be assisted by interesting his employer or others, and by securing assistance from charitable or public bodies; occupation may be found for the wife or elder children. The mother of a family may be given advice and assistance in arranging for the care of the children, and the supervision of the home conditions may obviate the too early self-discharge of a patient anxious about his or her family. (2) *Assisting patients upon the completion of institutional treatment*, by (*a*) rehousing of the family, (*b*) finding new and suitable work or a more suitable occupation, (*c*) negotiating to secure modifications in the conditions of former employment. (3) *Assisting in the prevention of spread of infection*, by the loan of beds and bedding or increasing or changing the accommodation in order that the patient may sleep alone. In the case of a contagious patient, the removal of contacts from the home may in the case of young children prove a life-saving measure.

Village settlements as a solution of the post-institutional problem will be discussed later.

The expensive and complicated work to be carried out by care organizations makes the composition of its personnel a matter of great importance. Various arrangements exist. The work may be carried out by a sub-committee of the public health committee, by a purely voluntary body, or by a committee consisting both of members of the local authority and voluntary social workers. (The latter are undoubtedly useful, not only for the enthusiasm which they bring to the work, but for the fact that they may be able to tap sources of assistance inaccessible to officials.) In all organizations, however, the tuberculosis officer should be a member of the committee, not only to advise the

latter in regard to the medical aspect of the patient, but in order to be himself better informed of the environmental conditions of the patients. Finally, the committee should be in intimate touch with the public assistance committee and all public and charitable organizations which may be of assistance to individual cases.

Institutional Treatment

New conceptions are being introduced into the treatment of pulmonary tuberculosis. The sanatorium principle as practised at the beginning of this century consisted of admitting patients in all stages of phthisis to an institution situated in the country for adequate feeding and a varying proportion of rest and exercise, and this still persists in many parts of the country. In more enlightened districts an attempt has been made to reserve sanatoria for 'early' or ambulant cases, in whom arrest of the disease may be expected, and to provide special hospitals or make use of municipal hospitals for other patients. Alternatively hospital sections have been established in the sanatorium itself (sanatorium hospital). It is being increasingly realized that in the treatment of phthisis, rest (whether general or local) is of primary importance, and that 'fresh air' plays a comparatively minor role. This fact and the more frequent resort to surgical procedures is guiding policy still further in the same direction. While the true country sanatorium should still be available for a small number of suitable cases, the institutional treatment of most patients with phthisis (observation cases, cases for 'preliminary' periods of rest—and this should be much more than merely rendering the patient apyrexial,—those for arti-

ficial pneumothorax or surgical interventions, chronic cases requiring a short period of education in personal preventive measures) can be best carried out in a hospital situated on the outskirts of a town. As the equipment and staffing of such institutions are costly, and cannot be too much multiplied in the same county district, it might even be found necessary for two or more counties to establish a joint hospital. It has further been suggested that as the methods of investigation and surgical treatment of tuberculosis are also used in other chest diseases (such as bronchiectasis, abscess, &c.), these institutions should also be available for the treatment of the latter diseases—hence, the advocacy of 'chest hospitals'.

Certain essential features of sanatoria and hospital sanatoria must be stressed. Patients need to spend long periods in these institutions. If they are to agree to this, not only must home anxieties be removed (as discussed under care organizations), but the institution must provide certain amenities—comfort, recreation, occupation. Too many institutions still appear to have been designed to provide a test of endurance for the inmates. At present the average stay of patients is far too short, and the experience of medical superintendents who believe in the need for long periods is that the patient who is willing to remain as long as is deemed advisable is the exception rather than the rule. Table 22 illustrates the increasingly better results obtained with longer period of treatment; and twelve months achieves on the average almost the maximum benefit obtainable.

The importance of the personality of the medical superintendent of a sanatorium or sanatorium hospital in the management of the institution, and the results

obtained, is well recognized. But perhaps it is not so well realized how much benefit would be derived from a closer liaison between the institution and the dispensary. In considering the discharge of a patient the medical superintendent should be guided by the

TABLE 22. *Showing the numbers and percentages of adult patients in whom the disease was quiescent at the time of discharge after different periods of treatment (1926–28) (Lancashire)*

Condition on admission	*Number dis-charged*	*Number in whom the disease became quiescent*			
		Duration of treatment			
		Under 3 months	*Under 6 months*	*Under 12 months*	*Under and over 12 months*
T.B.–	659	113 (17·2%)	265 (40·0%)	321 (49·0%)	336 (51%)
T.B.+I	364	28 (7·7%)	63 (17·3%)	85 (23·5%)	94 (25·8%)
T.B.+II	814	15 (1·8%)	43 (5·3%)	72 (8·8%)	75 (9·2%)
T.B.+III	114	..	2	3	3 (2·6%)

patient's home conditions (environmental and economic) *at that time*. While the periodic visits of the tuberculosis officer to the institution may be of assistance in this respect, the best results would be obtained by close co-operation between the care organization and a special social worker (e.g. almoner) detailed for this purpose in the institution. Not only would such an arrangement assist the medical superintendent in fixing the date of the patient's discharge, but the care organization would be warned in time to make

any necessary preliminary economic and domestic arrangements.

The provision of adequate beds for advanced cases is a preventive measure of the highest importance and an essential component of every scheme. The municipal hospital may well serve this purpose.

The institutional treatment of non-pulmonary tuberculosis has until recently been left almost entirely to voluntary hospitals. But such provision is necessary in all tuberculosis schemes, and it is more economical to treat all orthopaedic cases in the same institution. The special equipment and staffing may in this case, too, necessitate the union of two or more counties for this purpose.

Children should be catered for by providing special blocks in institutions for adults, or in hospital sanatoria provided for them. Teaching facilities must be available. Open-air schools should be supplemented by residential schools or 'preventoria' for children infected with tuberculosis, whose low general condition may predispose them to the development of active disease.

Finally, local authorities should be encouraged to establish in a municipal hospital a special department for pregnant tuberculous women where the infants may be separated immediately after birth. (See description of the Maternité Baudelocque in Paris—Kayne [1935 *b*].)

The removal of child contacts from 'tuberculous' households has given rise to controversy. The practice originated in France in 1907 as a result of the work of Professor Grancher and has developed, both as regards the number and the care taken of the children, in that country, in Belgium, and more recently in Canada.

Norway and Sweden have in recent years carried out the separation of contacts until about the age of 3 almost as a routine measure. In England a scheme exists in connexion with the London County Council who arrange for children to be boarded out in the country through the Invalid Children's Association. In Shropshire a scheme has also been established. The whole subject has recently been fully reviewed by the author (1935 *a*). It appears that, while paying due consideration to the question of family ties and the possibilities of hospitalization of the infectious person in the households, there still arise many occasions where the removal from a home of one or more children is essential for a shorter or longer period. I concluded that provision for such separation should be made both in regard to an institution (for infants and very young children) and boarding-out in families in the country. In order to carry out these methods efficiently, the union of several authorities would be essential.

Village Settlements

These constitute an attempt to solve the problem of the handicapped working man after he has completed institutional treatment for phthisis. In their conception is included a sanatorium hospital (for patients in all stages of pulmonary tuberculosis) and an industrial section where the treatment may be prolonged and training in a suitable occupation begun. A certain number of suitable patients are chosen to settle in a bachelors' hostel or, if married, with their families in bungalows or houses in the associated 'village'.

'The village settlement provides permanent employment under hygienic conditions in a variety of

trades, paying Trade Union rates of wages to its trained workers and thus constituting a village community which combines industrial work with a rural environment' (MacNalty, 1932). The work can be suited to the worker's physical fitness, propaganda to encourage a hygienic mode of living can be easily carried out, and in the event of relapse the settler is immediately brought under treatment.

The pioneer work in connexion with village settlements was begun by Dr. (now Sir Pendrill) Varrier-Jones at Bourne, Cambridgeshire, in 1916. The Papworth Village Settlement (admitting males and females from all parts of the country) which has since developed there, is still under his directorship, and covers about 350 acres of land. There are now 3 hospital blocks with a total of 170 beds, a sanatorium section of 100 beds, a hostel section of over 130 beds, and a village settlement of over 100 cottages. The total population is about 1,000.

Preston Hall, which is situated near Maidstone, Kent, was taken over by the British Legion in 1925, and has been developed on the same lines for ex-service men and their dependants. Thus, in both cases the responsible authorities are 'voluntary'. The Preston Hall estate covers 200 acres, and 300 beds are now available for the treatment of patients (in addition to the 100 beds available at Douglas Hall, Bournemouth). In the village there are 127 houses for married settlers. The total population (including patients, sanatorium staff, settlers and their wives and dependants) was 1,003 in July, 1935. The chief industries at these centres are carpentry and joinery, building, cabinet making and upholstery, the manufacture of leather travelling goods and fibre cases, poultry farming,

printing, signwriting, boot repairing, and horticulture. The industries are run by ex-patients who are now settlers, but at both institutions there are a few healthy men who take on certain of the more responsible or 'key' posts. The object of the industries is to manufacture goods which find a ready sale in the open market, either wholesale or retail, and to endeavour to sell the articles at a figure which will enable wages and certain other charges to be defrayed from the profits of such sales.

The prospective settlers are chosen from among the patients undergoing treatment, and no one is admitted to the settlement unless there is evidence that the disease is likely to remain quiescent for some time. The wages vary (at Preston Hall they amount to at least 1*s.* 1*d.* per hour) and are fixed from time to time, according to the efficiency of the individual. Unmarried settlers pay 27*s.* 6*d.* per week for board and lodging and married settlers pay rent (about 8*s.* per week at Preston Hall), but no rates, for the houses in which they live. An excellent account of both institutions will be found in the reports of the employment committee of the Joint Tuberculosis Council on care and after-care schemes in tuberculosis (1930 and 1935).

Village settlements have definite limitations. The criticism that such a settlement established out of public funds places the tuberculous person in a privileged position in comparison with persons suffering from other chronic diseases, can be dismissed by stressing the peculiar aspect of the treatment of phthisis, in that it acts as a preventive measure to the community as a whole. Moreover, a new principle has recently emerged, for it is being stressed that in order

to define the sphere of activity and increase the usefulness of these institutions, the recovered group of cases which may be in settlements occupying valuable houses and places in workshops, should be replaced by other persons in need of active and urgent treatment. This principle is now adopted at Preston Hall and people who have recovered from tuberculosis are no longer given security of tenure, but are asked to leave the village.

Settlements must clearly be reserved for certain types of patients only—thus both those people who are completely restored to good health as a result of institutional treatment and can resume an active life in their previous occupation, and those whose disease is too advanced to enable them ever to become members of an industrial community, are excluded. Moreover, patients must also be suitable temperamentally to life in a village settlement.

The Ministry of Health have taken great interest in village settlements. They have made grants both to Papworth and Preston Hall, and encouraged the progress of Barrowmore Hall in Cheshire, a small colony set up by a voluntary committee, which is developing on the lines of a village settlement (at present there are 37 settlers). In 1920 the Barlow Commission recommended the establishment of 10 settlements in this country, but for various reasons these have not yet materialized. MacNalty (in 1932) stated that the Ministry were engaged in investigating with certain county and county borough councils the possibility of establishing village settlements in other areas. He concluded that the village settlement grafted on a hospital sanatorium scheme, was the most hopeful means for ensuring the after-care and well-being of a

certain proportion of patients suffering from tuberculosis.

MacNalty (1932) deals in some detail with the chief points which local authorities need to consider in establishing village settlements, although so far, with the exception of Nottinghamshire, no other local authority 'has ventured into the admittedly difficult paths of village settlement administration'. There must be a sufficient number of patients willing to avail themselves of the institution (therefore the union of two or more authorities would almost certainly be necessary for this purpose). The number of men trained to carry out successfully the functions of medical director is very limited. The choice of suitable industries may prove a problem. And, finally, there is the question of capital outlay and of maintenance, which is probably acting as the most powerful deterrent to local authorities. The transfer of public assistance to the local authorities by the Local Government Act, 1929, and the adoption of a long-sighted policy should encourage authorities to become convinced that the establishment of these institutions makes for economy eventually.

The Schemes as a Whole

I have attempted to indicate the desiderata in the various components of a complete tuberculosis scheme, more or less *practicable within the present administrative framework.* How far do the tuberculosis schemes in this country approach these ideal lines? Since the Ministry of Health (the central authority), apart from enforcing the basic parts of the schemes, only act in an advisory and guiding capacity, hoping that the example of the progressive local authorities will

encourage the others, much variation in the details and completeness of the schemes is to be expected. Side by side with authorities whose scheme presents almost every feature that could be desired are found others whose administration of the disease barely fulfils the letter of the law, and makes no serious attempt to interpret its spirit. Mere ignorance or callousness need not be adduced to explain this state of affairs. The impression gaining ground that 'tuberculosis is conquered' may be partly responsible as not justifying increased action—an attitude which takes little account of the 30,000 persons per year still dying of tuberculosis in this country. But much can no doubt also be explained by the difficulty met in making efficient arrangements in county districts, whose administrative limits for all public health and other functions were set many years ago, at a time when the multifarious and complicated work which they now have to undertake was not foreseen.

It is of great interest to examine the death-rates from tuberculosis in the different administrative counties and county boroughs in England (tables 23 and 24). Thus, in the counties in 1933 the mortality of all forms varied from 50 per 100,000 population in Wiltshire to 92 in Cumberland. (Peterborough 42, London 93, and—if Wales is included—to 124 in Caernarvon.) In the county boroughs the same rate varied from 50 in Dewsbury to 183 in South Shields. No doubt these variations are largely accounted for by the age distribution of the population in the district and the economic and social conditions, but one may well inquire how far the efficiency and adequacy of the tuberculosis schemes play a role. The variation in the work of the tuberculosis schemes of

counties, county boroughs and London is illustrated by table 25.

TABLE 23. *Death-rates from tuberculosis in the year 1933*

Administrative counties. England and Wales

Administrative counties	*Death-rates per 100,000 population*		
	Pulmonary tuberculosis	*Other forms*	*All forms*
Peterborough.	32	10	42
Wiltshire	42	8	50
Rutland	39	11	50
Derby	41	11	52
Huntingdon	36	17	53
Buckingham	44	10	54
Suffolk West	48	8	56
Norfolk	44	13	57
Cheshire	44	13	57
Sussex East	44	14	58
Oxford	48	11	59
Somerset	47	12	59
Dorset	44	15	59
Wight, Isle of	52	7	59
Flint	45	15	60
Sussex, West	52	9	61
Suffolk, East	50	13	63
Cambridge	54	9	63
Berkshire	51	12	63
Yorks, West Riding	49	14	63
Hampshire	50	13	63
Yorks, North Riding	46	17	63
Ely, Isle of	46	17	63
Northampton	54	9	63
Essex	53	11	64
Surrey	55	9	64
Hertford	53	11	64
Yorks, East Riding	50	15	65
Shropshire	51	14	65
Warwick	53	12	65
Gloucester	53	13	66
Lancashire	56	13	69
Nottingham	53	16	69
Bedford	58	12	70
Middlesex	60	10	70
Worcester	60	12	72
Devon	63	11	74
Lincs. Kesteven	58	17	75
Lincs. Lindsey	64	12	76
Kent	64	13	77

TABLE 23 (*contd.*)

Administrative counties	*Death-rates per 100,000 population*		
	Pulmonary tuberculosis	*Other forms*	*All forms*
Westmorland	67	11	78
Stafford	66	12	78
Hereford	61	17	78
Cornwall	65	15	80
Montgomery	70	10	80
Brecon	64	17	81
Lincs. Holland	67	14	81
Denbigh	65	17	82
Leicester	69	13	82
Monmouth	69	16	85
Northumberland	65	20	85
Durham	69	19	88
Carmarthen	72	16	88
Cumberland	71	21	92
London	82	11	93
Radnor	67	29	96
Cardigan	87	13	100
Glamorgan.	83	18	101
Merioneth	93	12	105
Anglesey	91	23	113
Pembroke	90	25	115
Caernarvon	105	19	124

TABLE 24. *Death-rates from tuberculosis in the year 1933*

County boroughs. England and Wales

County boroughs	*Death-rate per 100,000 population*		
	Pulmonary tuberculosis	*Other forms*	*All forms*
Dewsbury	47	3	50
Doncaster	51	11	62
Burton-on-Trent	51	12	63
Southport	49	14	63
Wakefield	53	13	66
Canterbury	63	4	67
Ipswich	53	14	67
Bolton	53	15	68
Smethwick	63	5	68
Bury	54	15	69
Southend	63	7	70
Rotherham	65	6	71
Hastings	57	14	71
Bournemouth	61	10	71
Eastbourne	64	9	73

TABLE 24 (*contd.*)

County boroughs	Death-rate per 100,000 population		
	Pulmonary tuberculosis	*Other forms*	*All forms*
Bath	54	19	73
Halifax	58	15	73
York	63	10	73
Rochdale	65	8	73
Wallasey	60	14	74
Blackpool	61	13	74
Croydon	68	10	78
Portsmouth	68	11	79
Derby	68	12	80
Northampton	66	14	80
Oldham	64	16	80
Blackburn	66	14	80
East Ham	71	10	81
Exeter	71	11	82
Wolverhampton	74	9	83
St. Helens	73	11	84
Sheffield	71	13	84
Stockport	74	11	84
Carlisle	68	17	85
Norwich	74	12	86
Lincoln	77	9	86
Coventry	78	8	86
Burnley	69	18	87
Oxford	72	16	88
West Bromwich	70	18	88
Bradford	75	13	88
Huddersfield	74	15	89
Preston	76	13	89
Brighton	76	13	89
West Hartlepool	69	24	93
Barrow-in-Furness	80	14	94
Grimsby	77	18	95
Worcester	86	10	96
Wigan	76	20	96
Darlington	87	10	97
Birmingham	86	11	97
Chester	93	4	97
Barnsley	81	17	98
Newport	82	16	98
Bristol	84	14	98
Warrington	76	23	99
Plymouth	87	12	99
Gloucester	94	6	100
Reading	92	8	100
Tynemouth	84	16	100
Great Yarmouth	74	27	101
Swansea	89	13	102

TABLE 24 (*contd.*)

County boroughs	*Death-rate per 100,000 population*		
	Pulmonary tuberculosis	*Other forms*	*All forms*
Stoke-on-Trent	88	15	103
Southampton	88	16	104
Nottingham	88	16	104
Leeds	86	18	104
Birkenhead	91	16	107
Merthyr Tydfil	79	30	109
West Ham	100	11	111
Dudley	101	10	111
Kingston-on-Hull	93	19	112
Walsall	103	12	115
Newcastle	92	24	116
Manchester	104	14	118
Sunderland	98	20	118
Leicester	109	16	125
Cardiff	105	22	127
Salford	114	20	134
Liverpool	118	18	136
Gateshead	116	23	139
Bootle	131	18	149
Middlesbrough	128	30	158
South Shields	138	45	183

TABLE 25. *England: table showing the work of the tuberculosis service during 1934 on a comparative basis: the ratio of the actual number under each item to 100 deaths from tuberculosis (all forms) which occurred during the year in each class of area*

	Counties (excluding London)	*County boroughs*	*London*	*England (all areas)*
New cases examined	305	310	377	317
Contacts examined:				
Children	87	104	126	99
Adults	53	76	118	70
Sputum examinations	308	473	465	394
X-ray examinations	245	382	212	295

Contact examination, inadequately carried out in the country as a whole (1·7 contacts examined per death from tuberculosis) is even less frequent in county districts, London being most advanced in this respect. Radiology also is far too seldom employed: in the country as a whole only 3 X-ray examinations are made for every 5 new cases seen (including contacts)[1]—again the counties are much behind the county boroughs, but it is a surprise to find London behind even the former in this respect. In regard to the (relatively few) sputum examinations, counties are behind both London and county boroughs. Examination of these figures leads to the conclusion that much responsibility is indeed still thrown on the stethoscope.

So much for diagnosis. Institutions for treatment vary from the most modern highly equipped hospital sanatoria, with the most recent radiological apparatus and with facilities for carrying out surgical treatment for both pulmonary and non-pulmonary tuberculosis, to unheated and temporary huts with no other means of diagnosis and treatment than the usual search for tubercle bacilli in sputum, and fresh air and an adequate diet. A similar diversity is found in the provision of care and after-care organizations (several being voluntary); in England in no less than 25 out of 50 administrative counties, and in 30 out of 76 county boroughs, no arrangements for care and after-care exist.

Training colonies and special workshops are institutions organized only by the very few. Village settlements have already been discussed.

The provision for children is often unsatisfactory,

[1] And this average does not allow for the re-X-raying of 'old' cases under supervision at the dispensary.

not so much in regard to available beds, as to the inadequate means for investigation, resulting in the confusion between infection and disease. Preventoria are non-existent and so are adequate arrangements for removing contacts from 'tuberculous' households, except perhaps in London.

Finally, as far as I know, no special department for tuberculous pregnant women has been established.

To summarize: local authorities have the necessary powers for providing an efficient and adequate scheme, and an improvement might be expected from the full exercise of these powers and the realization that true economy would follow the adequate treatment and the prevention of tuberculosis, since there would be considerable saving on the 'relief' now paid to the patient and his dependants. On the other hand, it must also be admitted that with the best of intentions ideal results cannot be obtained in many districts within the present administrative framework. Little difficulty should be experienced in large county boroughs, except in regard to the prolonged and adequate financial assistance required for many patients and their dependants. In scattered country districts the position is different, since every county council cannot possibly provide on its own all that is required. Perhaps reorganizing administrative districts, and constituting separate authorities for different duties may solve the problem to some extent. The future must, however, be envisaged on broader lines. Before attempting to do so, the strictly preventive aspect of the tuberculosis problem to-day must be summarized.

XVII

PREVENTION

In our present knowledge of the disease, we might hope to prevent tuberculosis of human origin by adopting the following measures:

1. The detection of pulmonary tuberculosis in its earliest stages:

   (a) By periodic examination of so-called healthy groups of the population, and *particularly* all contacts.

   (b) By more extensive use of radiology in the investigation of pulmonary tuberculosis.

   (c) By 'educating' the general practitioner and securing closer co-operation between him and the tuberculosis schemes.

2. The adequate treatment of pulmonary tuberculosis:

   (a) By efficient and sufficiently prolonged institutional treatment.

   (b) By the employment of artificial pneumothorax and surgical methods.

   (c) By the 'isolation', as far as possible, of sputum-positive patients, who cannot be treated by the above methods; segregation of advanced cases in hospitals, and admission of others to village settlements.

3. Where none of the measures under (2) can be carried out, the removal of non-infected children from households containing a sputum-positive case.

4. Immunization in certain circumstances will also have to be considered.

Human tuberculosis of bovine origin still remains

a substantial problem—one quarter of all children under 15 dying of tuberculosis die of the bovine form, even at present. That this form of the disease can be totally eradicated has been shown in certain states of America where all infected cattle are slaughtered and compensation is paid to the owners. The large number (40 per cent.) of infected animals in this country render this procedure impracticable owing to the shortage of the milk supply which would result. The subject is so amply discussed in this country that it does not require detailed reference here. The universal pasteurization of milk would appear a simple and practicable solution at present, and in this respect, at any rate, propaganda should know no restraint. The good results reported by Stanley Griffith, Buxton, and Glover (1935) with BCG, and those now being investigated with Spahlinger's vaccine will require consideration in the future.

Finally, in regard to all forms of tuberculosis, the improvement of the hygienic and economic living conditions of the working classes must remain a measure *du premier ordre* for the prevention of tuberculosis.

CONCLUSION

THE FUTURE

I HAVE endeavoured to stress certain essential features of the tuberculosis problem in England. Although the mortality has fallen considerably since 1850, and continues to show a downward trend, the disease is still responsible for an enormous loss of life and for much social and economic dislocation. Considerations for prevention and treatment in the future must take cognizance of two established facts. Firstly, the circumstances associated with poverty favour the occurrence of tuberculosis, the results of which often lead to further impoverishment of the family, and the establishing of a vicious circle. Secondly, our inadequate knowledge still necessitates the adoption of prolonged and elaborate measures for the prevention and treatment of the disease. The discussion in this book compels the conclusion that the present schemes for dealing with tuberculosis in the poor, while giving good results in many districts, cannot be held largely responsible for the decline in mortality, nor can they be relied on to produce by themselves further drastic reduction *within a short time*. It has been shown that while considerable improvement may be expected by the full exercise of the powers possessed by sanitary authorities, great difficulty is experienced in their practical application by some councils (particularly in country districts) owing to the administrative limits fixed many years ago with inadequate recognition of the distribution of the population or of the public health problems existing in the districts. Revision of these administrative limits is now overdue and should

lead to considerable improvement. I have attempted to show also, however, that owing to the peculiar relations existing between the public and general practitioners, and between the latter and the tuberculosis schemes, the best of schemes as framed at present cannot achieve ideal results.

Improvement in the economic and social status of the population, the foundation stone of prevention in tuberculosis, is a problem of a magnitude and complexity that forbid its further discussion here. The more purely medical aspect must, however, be envisaged. The increasing control by the State is leading to a realization of the inevitable line of development. Sooner or later the preservation of the health of the population will come to be regarded as on the same footing as national defence or police supervision, and a complete health service will be available for every citizen who falls ill, in the same way as the police serves now when he is attacked or threatened by others (Laski, Jennings, & Robson, 1935). This would not preclude the more wealthy members of the community from obtaining more luxurious accommodation or more individual attention, in the same way as they may now hire private detectives. The best results in tuberculosis can, however, only be achieved by assuring adequate economic support for the patient and his family, not only during the acute stage of the illness, but also for some time afterwards, by some system of insurance or by State assistance.

The unification of public health work implies that a complete unit of medical services will be available to all classes of the community in a given area, and need not mean that the provision of these services will be

free. Nor does it necessarily involve the loss of choice of practitioner by the patient or the levelling down of the work which those opposed to State medicine bring forward. In the interim report (1920) of the Consultative Council on Medical and Allied Services (under the chairmanship of Lord Dawson) appointed by Dr. Addison, when Minister of Health, recommendations were made as to schemes which, while retaining the more pleasant features of present-day medical practice, might hope to achieve the results considered here. Their conception includes a primary health centre in each district—'an institution equipped for services of curative and preventive medicine to be conducted by the general practitioners of that district, in conjunction with an efficient nursing service and with the aid of visiting consultants and specialists'—where patients would retain the services of their own doctor. A group of primary health centres would in turn be based on a secondary health centre, to which cases of difficulty or those requiring special treatment would be referred, and where the patients would be under the care of a more specialized personnel. Supplementary services would also be provided, and the above domiciliary services would be associated with various institutional services at both the primary and secondary health centres.

More recently (1936), Sir Farquhar Buzzard in his presidential address at the annual meeting of the British Medical Association at Oxford again drew attention to the need for considering this problem on such lines as I have indicated.

This, however, is looking far ahead. While attempting to encourage and effect improvements in the prevention and treatment of tuberculosis within the

present schemes, it should be borne in mind that in the furthest view the problem of tuberculosis in the poor becomes other than the problem of tuberculosis or that of the health of the poor, it is the problem of the health of the whole community.

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PRINTED IN GREAT BRITAIN AT THE UNIVERSITY PRESS, OXFORD
BY JOHN JOHNSON, PRINTER TO THE UNIVERSITY