

# **SOCIAL ASPECTS OF TUBERCULOSIS**

2. CIVIL ASPECTS OF TUBERCULOSIS



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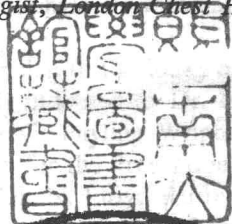
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by

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## PREFACE

**T**his book is the outcome of lectures to health visitor students at the Royal College of Nursing. With one exception, it has been deemed best to confine the book to Social Aspects of Tuberculosis as they affect this country; to do otherwise would have been to enlarge the scope of the work unduly, since every country has its own social problems affecting the disease. An exception has been made in the case of the chapter on tuberculosis in non-immunized races for whom the British Empire has especially heavy responsibilities. I have also thought it best to refrain from the discussion of the vexed question of prophylactic vaccination against tuberculosis which is still *sub judice*.

My cordial thanks are due to the many authors who have blazed the trail. I am especially indebted to Dr. Hyslop Thomson, Dr. P. D'Arcy Hart, Professor G. Payling Wright, Dr. F. Bradbury and the National Association for the Prevention of Tuberculosis, and to the editor of *Tubercle*, Dr. N. Lloyd Rusby.

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## INTRODUCTION

On a day in late March 1882 Robert Koch, a young German doctor who had already made some notable contributions to the new science of bacteriology, read a paper to the Berlin Physiological Society describing a small bacillus which he had discovered in various types of tuberculosis in man and in animals, and which he had succeeded in cultivating on blood serum outside the body. Towards the end of his paper he prophetically remarked: 'Tuberculosis has so far been habitually considered to be a manifestation of social misery, and it has been hoped that an improvement in the latter would reduce the disease. Measures specifically directed against tuberculosis are not known to preventive medicine. But in the future the fight against this terrible plague of mankind will deal no longer with an undetermined something, but with a tangible parasite, whose living conditions are for the most part known and can be investigated further.' Allen Krause has written a graphic account of this meeting, at which Virchow the aged pioneer of cellular pathology was present. He describes how the audience sat spellbound as Koch unfolded step by step the story of his meticulously planned experiments, and how when the paper was concluded they were so fascinated that they forgot, or at any rate failed to applaud, and when the chairman called for comments, there was no discussion at all. Even Virchow, once a stalwart leader of liberal ideas in the Reichstag, but now old and conservative in his views, sat in silence before this 'new thing come into mortal ken'. Perhaps all this was hardly surprising. The world had long accepted consumption as a doom. Two centuries earlier in his *Life and Death of Mr. Badman*, John Bunyan had described consumption as 'The Captain of the Men of Death'. And when Koch announced his discovery this malady of civilization was still the leader of the cohorts of disease.

The conception of tuberculosis as an infectious disease, was, of course, by no means new. It had been mooted as far back as the Middle Ages at least, but on that historic evening Koch settled the



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question once and for all. At that moment all medical men were thinking about Pasteur's new germ theory of disease and bacteriologists quickly started on a hunt for this newly discovered tubercle bacillus in every conceivable place. Lungs which had been preserved in spirit in specimen jars for many years were found still to contain dead bacilli. The organism was detected too, in the dust of wards. Koch himself demonstrated it in milk. It was soon realized indeed, that the bacillus was widespread in its distribution in the body of man and the domestic animals and in their secretions and excretions. Koch had likened tuberculosis to a plague and the phrase 'white plague' is still frequently heard in reference to it. But although this simile illustrates its widespread nature it is not a very happy phrase, calling to mind as it does a picture of a deadly epidemic disease sweeping rapidly through a community and sparing none. Tuberculosis is not at all like that. It is an endemic disease, always present in our midst, slow and insidious in its progress, protean in its manifestations, selecting its victims with an almost discriminating partiality.

During the last half century there has been a perfect spate of Royal Commissions, Committees of Inquiry and Surveys designed to explore the extent of tuberculous infection and to study the organism in relation to its environment, a study which we should nowadays call the ecology of the bacillus. The outstanding result has been to establish the dictum made quite early in the investigations by a German scientist that 'jedermann hat am Ende ein bisschen Tuberculose', which we may interpret nowadays to mean that everybody has a spot of the disease somewhere in his body—though we must hasten to add that it may not be active. Even in overcrowded communities where the disease is most prevalent not all the individuals become ill with it; only a relatively small number do so in fact; the rest pass through a phase of infection without illness. The task of the student of social medicine, therefore, is to explore the how and why of this infection. All this may be summed up in a series of questions as follows: (1) How is the tubercle bacillus transmitted from person to person? (2) Why do some people fall with the disease, whilst others do not? (3) What should be the attitude of the State towards a chronic infective disease always present in its midst? (4) What are our duties as a community to individuals who through no fault of their own develop this chronic disabling disease and become, for long periods, incapable of earning their living? In answering these questions we

## INTRODUCTION

shall see that the students of tuberculosis have had a very large share in the privilege of being pioneers in the development of social medicine. The Departmental Committee of the Local Government Board whose report was issued in 1912 defined the general lines along which the control of tuberculosis should proceed and in so doing its members blazed a trail which has been followed with unusual fidelity. But we must be always on our guard against the dangers of separating off from the rest of our maladies certain diseases like tuberculosis which lend themselves readily to the facile description of social diseases, and which can be regarded therefore as something apart from the rest of medicine. As we become more and more community conscious there is a tendency to do this to a greater and greater extent. To stress the preventive and hygienic side of medicine at the expense of the clinical is not in the best interests of the nation. Both branches are equally important and they are in reality one and indivisible.



## Chapter I

# FROM CONSUMPTION TO TUBERCULOSIS

**T**uberculosis may be defined as a disease produced by the invasion of the body tissues by the *mycobacterium tuberculosis*. Such a definition seems simple and obvious to us nowadays, but in olden times, in fact up to the date of the discovery of the causative organism, it was not so obvious. The disease has in the past masqueraded under a number of ill-defined terms such as phthisis, consumption, scrofula and King's evil.

**TERMINOLOGY.** The word tubercle is derived from a late Latin word *tuberculum* meaning a little swelling, and was used by the Roman physicians early in the Christian era to indicate any kind of small swelling. In the course of time the word has come to have two separate and distinct meanings: (1) anatomical, indicating a small nodule of healthy tissue, usually of bone, such as the tubercle of the tibia, and (2) pathological, signifying the grey and yellow tubercles found by the early pathologists in the autopsies of persons who had died of phthisis, consumption or scrofula. When Koch found a bacillus in these grey and yellow tubercles it was natural that he should call it the tubercle bacillus, and thereafter the older names began to give way to the simple comprehensive word tuberculosis by which the disease is now universally known. Some confusion has arisen over the use of the adjectives tuberculous and tubercular. Without crossing swords with the etymologists on this issue, the word tuberculous will be used throughout this book rather than tubercular which, in the author's opinion is best left to the anatomist as an alternative to the word nodular. Lastly a word about abbreviations may not be out of place. The contraction 'tub.' should be used for tuberculous and tuberculosis, and 'T.B.' for tubercle bacillus.

## EARLY STUDIES OF THE DISEASE

There are numerous records of the disease in the ancient writings of Europe and Asia, and the Hippocratic collection of medical works, written by Greek physicians in the fifth century B.C., contains a good description of the disease. Archaeological researches have revealed

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examples of tuberculosis of bone even earlier still, possibly it is said, as early as 3000 B.C. After the early study of the disease made by the Greek and Roman physicians, very little progress was made for centuries. All through the Dark and Middle Ages such medical writings as there were on the subject merely recapitulated the Greek work, and it was not until long after the revival of learning that any real progress was made. In our language consumption was first mentioned by Trevisa in 1398. He made a translation of the great encyclopaedia of the Middle Ages, *De Proprietatibus Rerum*, which had been written more than a century earlier by Bartholomew de Glanville, the Englishman, a Minorite friar who became professor of theology in Paris. There is no suggestion that Trevisa really knew any medicine, but he was an indefatigable translator, though, it is said, not always accurate. But an earlier description of the disease, in Latin, exists, written between the years 1380 and 1395 by Johannes de Mirfeld of the Hospital of St. Bartholomew in Smithfield. The work is a careful compilation made from earlier writings, entitled after the Augustinian Priory in which he lived, *Breviarum Bartholomei* and the chapter on consumption is headed *De Ptisi*. Towards the end of the seventeenth century, a few years after Harvey's discovery of the circulation of the blood, Sylvius described tubercles in the lungs and tuberculosis of the lymph glands. This may be regarded as the starting point of a revival of the study of a subject which had lain dormant since Greek and Roman days. From that time onwards, progress took place along two lines—pathological and clinical. On the pathological side progress really began with the removal of the ancient prejudice against the examination of the dead body. During the centuries of religious strife which rent Europe, Arab, Jew and Christian had at least agreed on one point, they all looked with extreme disfavour upon any interference with the dead.

**MORBID ANATOMY.** As this prejudice gave way before scientific thought and enlightenment there arose what may be described as the golden age of morbid anatomy, beginning with Morgagni (1682–1771) of Padua and ending with the introduction of the high power microscope and the researches on cellular pathology by Virchow. This period contains the names of many famous men among whom were Stark, Hunter, Baillie and Addison in this country, Laennec, Bayle and Louis in France, and Rokitsansky in Vienna, the latter making no less than 30,000 post-mortem examinations during his career. Not a

## EARLY STUDIES OF THE DISEASE

few of them suffered from the disease which they studied, including Matthew Baillie, who wrote the first English textbook on pathology, and Laennec whose classical account of tuberculosis has never been surpassed. Between them they described practically all the chief varieties of respiratory and non-respiratory tuberculosis. Naturally without the help of a high power microscope to guide them these morbid anatomists made mistakes here and there, but they were indefatigable workers dissecting early and late under the most primitive conditions and without a knowledge of antiseptics to protect themselves, and they well and truly laid the foundation of our study.

**CLINICAL MEDICINE.** On the clinical side descriptions of the disease were very largely tedious accounts of symptoms up to the time of the discovery of percussion by Auenbrugger of Vienna in 1761. 'I present to you, dear reader,' he writes, 'a new method of discovering diseases of the chest invented by me. It consists in knocking at the human thorax.' It seems almost unbelievable that the application of percussion to clinical medicine should have come so late. The fact that a drum had a hollow sound when struck must have been known to the primitive savage, but until Auenbrugger noted it, nobody seems to have realized that the very fact that 'the chest of the healthy human being gives a resonant sound when percussed' could be of clinical significance. Indeed Auenbrugger's discovery attracted very little attention, and it was left to Corvisart, Napoleon's favourite physician, to revive the art nearly fifty years later. The next clinical advance was that of the introduction of stethoscopic auscultation. There are various accounts of this. Here is one told in Laennec's own words. 'In 1816,' he writes, 'I was consulted by a young woman presenting general symptoms of disease of the heart. Owing to her stoutness, little information could be gathered by application of the hand and percussion. The patient's age and sex did not permit me to resort to the kind of examination I have just described (i.e. direct application of the ear to the chest). I recalled a well-known acoustic phenomenon; namely, if you place your ear against one end of a wooden beam, the scratch of a pin at the other extremity is most distinctly audible. It occurred to me that this physical property might serve a useful purpose in the case with which I was then dealing. Taking a sheet of paper I rolled it into a very tight roll, one end of which I placed over the praeordial region, whilst I put my ear to the other. I was both surprised and gratified at being able to hear the beating of the heart

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with greater clearness and distinctness than I had ever done before by direct application of my ear.'

**CELLULAR PATHOLOGY.** The next contribution came from a source entirely outside medicine. Early in the nineteenth century a number of physicists, among them Joseph Jackson Lister, the father of Lord Lister, introduced very great improvements in the manufacture of microscope lenses, which enabled pathologists to study in minute detail the material they had removed in the dead house. The importance of this work cannot be exaggerated. It started the student of tuberculosis on two new lines of research. The first was the study of the cellular structure of tuberculous lesions. This was important in helping to define which were tuberculous and which were not. Indeed it is more important than at first sight appears. Reading through old post-mortem records, one is much impressed with the fact that until the advent of microscopical study it was very easy to confuse tuberculosis with other diseases, and there was, indeed, a stage when pathologists tended to group many of them together under the vague term, infective granulomata. The second line of research was, however, vastly more important than the mere study of tuberculosis. It was the study of the group of minute organisms known as bacteria, a study which in its early days was known as the 'germ theory', and which in a short time revolutionized the whole of medicine. We owe this study to the pioneer work of Pasteur without which Koch's discovery of the tubercle bacillus might never have been made. One of the most remarkable things about Koch's research on the tubercle bacillus was its thoroughness. He not only found the bacillus in the little grey and yellow tubercles, he also grew it on artificial culture media. Subsequently, he confirmed the original observation of Theobald Smith that there were at least two strains of the organism, bovine and human, and he finally isolated their toxins.

**TREATMENT.** It is impossible to assign definite dates to the introduction of the standard methods of treatment which are nowadays often referred to as the tuberculosis triad, viz. fresh air, good food and rest. They appear to have come into use gradually with improvements in the standard of living. George Bodington is credited with being one of the pioneers of the fresh air treatment in this country with an essay which he published in 1840, but this method had certainly been in use in the eighteenth century. There were other pioneers in other countries, notably Brehmer in Germany, Spengler in Swit-

## HOSPITALS AND SANATORIA

zerland and Trudeau in America, but the man who really popularized treatment by fresh air and good food instead of an invalid diet (an extremely generous diet, in fact) was Otto Walther at his famous sanatorium of Nordrach in the Black Forest. The third element of the triad, rest, was not generally accepted until the end of the nineteenth century, at any rate in the form of absolute bed-rest in which we now know it.

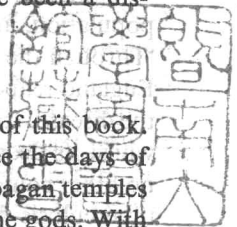
**RADIOLOGY.** Röntgen discovered X-rays in 1895 but it was not until the beginning of this century that the possibilities of chest radiography began to be appreciated. The earliest textbooks on the subject are those of Francis Williams published in America in 1903 and Walsham and Orton in this country in 1906. It would be difficult to overstate the value of this technique to the study of tuberculosis. It has revolutionized the whole subject and has now become so much a routine that one can hardly picture a clinical world without it.

**REST AND COLLAPSE THERAPY.** In due season absolute rest for the body as a whole led physicians to the conception of rest for the part. At first this was applied to the tuberculous joint or limb, by immobilization in a splint or similar apparatus. Then it was introduced for the lung by collapsing it in the hope that a non-expanding non-functioning lung would heal better than one in full work. There have been numerous methods of attaining this result, viz. artificial pneumothorax, phrenic crush and thoracoplasty, but descriptions of these belong to the domain of a clinical textbook and cannot be further elaborated here.

**SPECIFIC THERAPY.** Finally efforts have been made for many years to destroy the tubercle bacillus in the living tissues by means of bactericidal chemical substances, especially the salts of the heavy metals, of which gold has been the most important, and by anti-sera or vaccines. These methods of treatment are all summed together under the general term specific therapy. On the whole they have been a disappointing line of attack.

## HOSPITALS AND SANATORIA

A detailed account of hospitals is outside the scope of this book. They have probably existed in some form or other since the days of antiquity when sick persons slept within the shadow of pagan temples in the hope of obtaining protection and healing from the gods. With the Christian era came motives of philanthropy and charity, and





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monastic infirmatoria and lazaret-houses were established both by the cloistered orders and by the Knights Templars and Hospitallers, not only for the benefit of their own sick but for pilgrims and guests. There were also a few medieval hospitals apart from monastic foundations, as well as numerous 'pest houses' for plague cases. It is said that altogether 800 of these medieval hospitals of one kind or another were still in existence at the time of Elizabeth, and how many more had already been abolished by the dissolution of the monasteries is not known. Henry VIII founded certain royal hospitals in an attempt to meet the situation created by this dissolution. The Elizabethan Poor Law Statute of 1601, followed more than two centuries later by the Act of 1834, initiated a system of relief which in the course of time came to include institutions for the chronic sick poor, which lasted until the Local Government Act of 1929 transferred the duties to the County Councils. The great voluntary hospitals as we know them to-day—with the exception of a few which are legacies of monastic foundations, such as St. Bartholomew's and St. Thomas's—date from the early eighteenth century, the first of them in London being the Westminster founded in 1719. They owe their origin to private munificence and are still largely maintained by voluntary subscriptions.

Probably all these hospitals from medieval times onwards included the consumptive, intentionally or unintentionally, in the chronic sick which formed the major portion of their cases. Early in the nineteenth century special chest hospitals came into being, of which the first was the Royal Chest Hospital founded in London in 1814. They grew up at a time when clinical medicine generally was becoming specialized, but they were not open air hospitals or sanatoria and they did not at first pioneer any new treatment. They were founded simply in response to a philanthropic urge to meet the needs of sufferers from diseases which were taking a heavy toll of the population, and their good work soon became evident. Flick writes, 'Through the isolation of consumptives in these various institutions, England reaped a rich harvest in the reduction of the death rate from the disease. Its death rate in 1848 was 2.97 per thousand living people, whilst its death rate in 1888 was 1.54 per thousand living people. In no other country was there a similar reduction in the death rate from tuberculosis during this time.'

The Sanatorium movement reached this country from Germany,