

An interesting point in this case is that the two most recent examinations of the sputum have shown negative results.

He is a good type of settler, well-behaved, and a conscientious worker. His earnings since coming on the staff amount to £143 4s. 10d.—that is, at the rate of £115 a year. He has been off, on an average, 25.6 days per annum.

#### Physical Signs

There is pulmonary infiltration over both apices, with scattered patches over both lungs and some calcareous nodules on either side. The radiological examination shows good movement of the diaphragm on both sides. The patient's weight has varied by only 3 lb. in eighteen months.

#### CASE IX

This man, aged 39, was a miner in Lancashire, and served four and a half years in the Army during the war. Prior to coming to Preston Hall in October, 1929, he received treatment at two institutions in the North-West of England for a period of eight months in all. There is a strong history of tuberculosis in the family, and the patient has always been subject to so-called bronchitis. During an attack of "influenza" in 1926 tuberculosis was diagnosed and tubercle bacilli were found in the sputum. On discharge from a sanatorium in the North he was unable to find employment suitable to his physical condition, but some weeks after coming as a patient to Preston Hall he was sent to the printing department, where he made excellent progress. In July, 1930, he was admitted to the village settlement, and has become an apt compositor in the printing department. During the winter months he loses some ground, but in the better weather of the summer he makes substantial improvement. The sputum has been consistently positive for five years at least.

His total earnings since admission to the village settlement have been £165 4s. 6d.—that is, an average of £76 5s. 2d. a year—and the average number of days absent from work per annum is thirty-six.

#### Physical Signs

There is a dullness over the left upper lobe, and impaired resonance at the right apex. Pectoriloquy is heard over the left upper lobe, and fine moist sounds are audible over both apices from time to time. The *x*-ray picture showed that the lesion was most marked in the left upper lobe; there were diffuse calcareous deposits over the right lung. The patient's weight has not fluctuated more than 3 lb. in five years.

#### CASE X

This patient, aged 41, had good health as a boy. He joined the Royal Irish Fusiliers in 1899. He was sent to Ostend at the outbreak of the war in 1914, and to the Dardanelles in 1917. He kept fairly well until the latter part of 1917, when he developed pains in the chest and lassitude. While at home in 1918 he reported sick at Chatham, and pulmonary tuberculosis was diagnosed. He was discharged immediately, with a pension for pulmonary tuberculosis due to war service.

Following upon a period of treatment at Brompton Hospital for three months and at Frimley Sanatorium for a further thirteen weeks, he worked in Suffolk as a gardener until 1920, when he had a breakdown and was readmitted to Brompton Hospital prior to coming to Preston Hall in December, 1920. The sputum was then positive. At Preston Hall he was trained in the boot department under the Industrial Settlements Incorporated, but when the British Legion took over in 1925 he was transferred to the appliance department. In 1927 and again in 1930 it was necessary to admit him to hospital, for eight and three weeks respectively, owing to temporary incapacity. Since then, however, he has remained fairly well. His weight has been stationary for five years.

Socially this man leads a quiet and well-ordered life. He has three children, all of whom are well. His total wages since April 1st, 1925, come to £772 5s. 10d., the average earnings being £102 17s. 3d. a year. The rate of absenteeism is forty-nine days a year.

#### Physical Signs

The lesion in this case is confined to the right upper lobe, with a small patch at the left apex. The right middle and lower lobes and the left lower lobe are comparatively clear, and all the evidence tends to show that the disease in this case is completely arrested.

#### SUMMARY

Short histories with notes on the physical signs of ten relatively advanced cases of pulmonary tuberculosis are given. The total period of sojourn of all ten cases in the village settlement at Preston Hall is thirty-nine years and two months. The sputum has been positive in all cases, and is still positive in seven.

During the five-year period prior to their admission to the settlement at Preston Hall these men have had, in all, at least 198 months of sanatorium treatment—that is, an average of 120 days per man per annum. Since being admitted to the settlement at the British Legion Village they have earned collectively £3,926 4s. 8d. in wages, or an average of £106 8s. 6d. a year. The average number of days per annum absent from duty from all causes, including tuberculosis, is 44.8. Only two men—Cases V and VIII—are doing work in which they had training before coming to the village settlement.

The cost of treatment, on the basis of 45s. per patient per week, to local authorities for this group during the five-year period prior to their coming to the village settlement is altogether £1,935. During the period under review, however, these ten cases have cost local authorities in sanatorium treatment only £144.

It is submitted, in conclusion, that the results, medical and economic, in these cases are a definite improvement on those which could be obtained in a similar group of patients for whom the special conditions prevailing in a village settlement are not available.

## PROGNOSIS IN PULMONARY TUBERCULOSIS

BY

W. STOBIE, M.D., M.R.C.P.

PHYSICIAN, OSLER PAVILION, RADCLIFFE INFIRMARY, OXFORD

Prognosis in tuberculosis is fraught with difficulty. One patient, diagnosed early and treated promptly and skilfully under the best conditions, may go steadily downhill, while another makes uninterrupted improvement, despite every unfavourable circumstance. Why does this difference exist? Let us consider the common or ulcerative type of pulmonary tuberculosis, selecting those cases in which the sputum has been found positive—the only unequivocal evidence of the presence of the disease.

In diagnosis, physical examination and *x*-ray investigation are not enough, valuable as they are. Specific therapy and sanatorium treatment produce the best results in cases of "primary" infection (where natural cure can be expected). The healed lesions of the lungs found at necropsy after death from non-tuberculous causes are attributed to infection of this nature. It will be necessary to define a standard of cure and to describe the results of treatment. The Ministry of Health advises the use of the following terms:

*Quiescent.*—Cases in which there are no symptoms of tuberculosis and no signs of tuberculous disease except such as are compatible with a completely healed lesion, and in which sputum, if present, is free from tubercle bacilli.

*Arrested.*—Cases in which the disease has been "quiescent" for a period of at least two years; in non-pulmonary cases if the disease is "quiescent" and there is reason to believe that it is unlikely to recur.

*Recovered.*—Cases in which arrest of the disease has been maintained for at least three years.

The features of "quiescence" form a satisfactory standard. It is recognized clinically by gain in weight, the lessening of physical or radiological signs, absent or negative sputum, normal temperature and pulse rate, and so on. This criterion necessarily excludes that all-too-common group of cases which tend to speedy relapse after discharge from institutional care. Clinically, we recognize the group of patients that respond unfavourably to treatment whatever the conditions.

*Age: Sex: Race.*—The age of the patient is a factor. Speaking generally, the younger the patient the worse the prognosis. Before the advent of compression therapy it was said, and not unreasonably, that a child affected with pulmonary tuberculosis before the age of 16 was doomed unless the disease was located in the root glands (with or without ulceration into a bronchus). To-day it is possible to save a certain proportion of the young patients by early artificial pneumothorax, although the outlook continues to be gloomy until the age of 35 or thereabouts. It is unfortunately true that the majority of cases occur in the age group below 35. From 50 onwards the resistance of the patient to tuberculosis appears to increase, perhaps from repeated small doses of tuberculin; at this time of life the prognosis is better and the chances of arrest are much greater. These cases are frequently classified as chronic emphysema and bronchitis, or chronic asthma, as the result of masking of the signs of pulmonary tuberculosis. It is probable that the influence of sex on prognosis should be attributed, in the main, to occupation and environment rather than to sex *per se*. An outstanding exception to this generalization occurs in pregnancy: a woman may show apparent improvement while pregnant, but parturition is commonly followed by extension of pulmonary damage. In my opinion, although it is generally unnecessary to terminate a first pregnancy, it is imperative that further conceptions be avoided. It is difficult to analyse the effect of race on prognosis, but experience teaches that this should be more guarded in Irish patients, probably because of actual environmental conditions rather than intrinsic racial factors.

*Sociological and Psychological Factors.*—It cannot be too strongly impressed upon medical students that pulmonary tuberculosis in the artisan classes and pulmonary tuberculosis in the wealthier classes, considered from the point of view of prognosis, are two entirely different diseases. As Sir Pendrill Varrier-Jones has so aptly put it, "The working man cannot afford to be an early case of pulmonary tuberculosis." Arrest of the disease is more likely if the patient can winter in Montana or Bordighera, or on our own South Coast, rather than in the stagnant and vitiated air of slum tenements. Uncertainty of employment and poverty, for the working man, militate against recovery. Such anxiety is inimical to recovery, as indeed are the late hours and associated dissipations of the wealthy young man in a foreign health resort. Discipline is essential. An ordered life, with an obedience to what must often be unpleasant restrictions, adds considerably to the chances of recovery. It must be recognized that the patient's response to the physician's instructions in this matter depend to a large extent on the temperament of the former. A sensible placid man can adhere to rules and regulations without difficulty, and the outlook is better than in the headstrong individual who will only obey as long as it suits himself to do so. Marcus Patterson's dictum (often erroneously attributed to Kingston Fowler)—"No fool ever gets rid of tuberculosis of the lungs"—is near enough the truth to be accepted. In the middle-aged patient large quantities of alcohol appear, at times, to promote the healing processes of the lungs! Although this form of treatment would, without doubt, be popular with many patients,

it is unlikely to gain widespread acceptance in these days of financial stress, at least in public institutions.

*Pulse Rate and Fever.*—In estimating the chances of a patient many observers regard the temperature range as the most important. In my opinion the pulse rate should be regarded as predominant in this forecast. An increase in pulse rate is much more difficult to control than a moderate degree of fever. The heart beat affords more evidence of a severe degree of toxæmia than the thermometer, and it is on the degree of toxicity rather than on the physical signs that judgement depends. Extensive lung damage, as evidenced by x-ray and clinical examination, without toxicity bears a much more favourable prognosis than a case of apparently early disease with considerable systemic poisoning. In other words, using Sir Robert Philip's symbols, the outlook is better in L3 S1 than in L1 S3. It is said that patients with the inverted type of temperature—up in the morning, down in the evening—carry a bad prognosis. Under modern methods of treatment it is frequently possible to convert a swinging temperature into a steady one. The effect of an artificial pneumothorax, by ridding the patient of a constant source of poisoning, is sometimes quite dramatically reflected in the temperature chart.

*Physique and Heredity.*—Notwithstanding numerous attempts to comfort the public by stressing the role of environment rather than heredity in the acquisition of tuberculosis, we cannot lightly disregard the significance of a family history of the disease. Where there is a well-marked habitus phthisicus as well as a bad family history, the outlook is indeed black. Nevertheless, it would appear that with each successive victim the bacillus loses something of its virulence: in general, a well-nourished member of a phthisical family in which three or four have died has a better chance than an ill-nourished patient of apparently healthy stock. The classical type of habitus phthisicus is recognized in lay as well as in medical literature. The delicate, fragile-looking young woman with the lovely complexion and the long dark eyelashes has a poorer chance than the squat, coarse-featured, unattractive woman.

*Mode of Onset: Influenza.*—The method of onset has a distinct bearing on prognosis. The fact that a single hæmoptysis is regarded as of good import is probably due, in some measure, to the fear that the sight of blood induces in a patient, with the consequent readiness to seek medical advice. Repeated hæmorrhages, on the other hand, are unfavourable, suggesting ulcerative processes in excess of fibrotic changes. Dry pleurisy, as an initial condition, is of favourable significance, suggesting a chronic type of disease. I am not quite certain how far the history of a pleural effusion influences the end-result of the pulmonary process when it manifests itself five to ten years later. Nor can I be dogmatic as to the effect of a pleural effusion during the course of an obvious case of florid phthisis. Effusions are curiously rare in cases in which no surgical interference is attempted. Effusions are common in artificial pneumothorax, appearing (as established by screening) in 50 to 70 per cent. of cases. I believe that effusions are beneficial to the patient, and that they should not be interfered with, save in exceptional circumstances. It is comparatively rare that they become infected or cause respiratory embarrassment. Absorption may occur, leaving a collapsed, scarred, but inactive lung. Reactivation may supervene on the removal of fluid. The history of "influenza" often means a grave prognosis. Without discussing the problem of the real nature of the "influenza" (whether it is tuberculous or not), it is undoubted that cases following "influenza" exhibit a sinister type of disease and

rarely respond to treatment to any degree. Clinically and radiologically they are of acute type with diffuse areas of disease in both lungs.

*Extent of Disease, Complications.*—The extent of disease is important. The patient with unilateral or mainly unilateral disease has, because of modern methods of treatment, a better chance. The outlook in upper lobe disease is better than in lower lobe disease, although the advent of phrenic avulsion makes the latter less unfavourable. Complications, particularly those which are tuberculous, seriously affect the prognosis. Intestinal ulceration is rarely recovered from. To-day, tuberculous laryngitis, serious enough, does not necessarily mean a fatal termination. Artificial pneumothorax may lead to the control and ultimate cessation of sputum, thus giving an infected larynx an opportunity to heal. Of non-tuberculous complications diabetes is serious, but, with the help of insulin, is not hopeless. In my view mitral stenosis, a rare complication, can still be regarded as a deterrent to the progress of lung disease.

*Special Investigations.*—The results of laboratory investigations have some bearing on the question of prognosis. In this paper I am confining myself to those cases in which the sputum is positive, and thus the question of the prognostic significance of the tuberculin test does not arise, although I must add that the elucidation of its meaning in prognosis has been aided not a little by Ranke's hypothesis of the three-stage reaction. It has been held by some that the appearance of the bacillus under the microscope affords some indication of the degree of virulence. The long, thin type of bacillus is said to be the most virulent, the short stubby type with the Much's granules the least virulent. In recent years the

sedimentation rate of the erythrocytes has come to be regarded as of considerable prognostic value. I am not convinced of this. By others, emphasis is laid on the value of the Arneth count, vital capacity estimations, and so on. Frankly, I regard most of these as mere frills. The clinical judgement of the physician is, to my mind, the most valuable contribution to the evaluation of prognosis. A radiologist may miss a case of early diagnosis of pulmonary tuberculosis if his view is sought before that of the physician. Furthermore, x-ray examination cannot reveal a shadow until the lesion is of appreciable size (and most probably recognizable by the clinician). On the other hand, it commonly reveals disease deeper and more extensive than can be shown by ordinary clinical examination. In demonstrating the existence of cavitation x rays are invaluable. To the expert they indicate not only the true extent but the different forms of the disease, as shown by different types of shadows. For example, the fluffy cotton-wool patches represent an acute type of disease with unfavourable prognosis, while firm striated areas suggest a longer history, greater resistance, and a better prognosis.

#### SUMMARY

I suggest that the well-built person over 35 years of age with a good family history, a comfortable financial position, and with little evidence of toxæmia, has a much better prognosis than the young man of 20, of the artisan class, with poor physique, a bad family history, and obvious evidence of toxæmia. But in considering even the latter group we must not forget Samuel Gee's abiding aphorism: "Never give a definite opinion as to how long a patient suffering from phthisis will live, for the only certainty is that—if you do—you will be wrong."

## PHTHISIS IN ADOLESCENCE AND EARLY ADULT LIFE\*

BY

W. BURTON WOOD, M.A., M.D., M.R.C.P.

PHYSICIAN TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS; CONSULTING PHYSICIAN FOR PULMONARY TUBERCULOSIS TO THE ESSEX COUNTY COUNCIL

For many years there has been a steady decline in the death rate from tuberculosis in all its forms, in both sexes, and at all ages—with one notable exception. There is everywhere a relative—and in some districts, I believe, even an actual—increase in the death rate among young females between the ages of 15 and 25 years.

A letter from Mrs. Siddons to Mrs. Galindo in 1803 describes a situation with which we are all sadly familiar. Though something of the greenroom is apparent in her writing—for even in her private sorrows she cannot quite forget that she is the Queen of Tragedy—the terror that broods over a household stricken by consumption has never been described in more moving terms. "Two lovely creatures gone, and another is just arrived from school with all the dazzling, frightful sort of beauty that irradiated the countenance of Maria, and makes me shudder when I look at her. I feel myself like Niobe, clasping to her bosom the last and youngest of her children, and—like her—look every moment for the vengeful arrow of destruction." *Sunt rerum lachrymae.*

Time was, and this in days within living memory, when a diagnosis of consumption in adolescence was rightly regarded as a sentence of death. The "churchyard cough" was the inevitable prelude to the grave, and in some country churches white gloves and faded garlands

still hang in clusters round the nave cornices in pathetic witness of virgins untimely dead. If we may judge by the novelists of the period, consumption was the normal fate of youth allied to beauty, but the Lady of the Camellias might have looked forward to a disreputable old age had she lived to-day. Many practitioners, I think, still fail to realize the change that has taken place in the outlook for young consumptives—that, owing perhaps partly to increasing racial immunity, especially in towns, but much more, as I think, to radiology and collapse therapy, the outlook for them need no longer be regarded as hopeless. The disease is, as a rule, curable in its early stages, and even advanced disease will often yield to modern methods of treatment.

We owe a special debt to radiology, because it enables us to diagnose tuberculosis in its earliest stages without regard to the physical signs which, in this disease, are notoriously misleading—signs which, indeed, may be absent despite the presence of virulent disease. But radiology is essential not only for accurate diagnosis, but also for the control of treatment. Our most effective treatment—rest for the lung by a prolonged period of recumbency or by collapse therapy—cannot be properly exercised or adequately controlled without x rays.

#### SYMPTOMS IN EARLY DIAGNOSIS

Diagnosis, however, is even more important than treatment, and, if I may presume to add one word of advice concerning the early diagnosis of pulmonary tuberculosis in adolescence, I would say:

(a) Pay much attention to symptoms; they are usually more reliable than physical signs, and of the signs perhaps the patient's appearance and manner are as valuable as any.

\* An address given to Essex general practitioners at Black Notley Sanatorium.