TUBERCULOSIS

A Primer and Philosophy

McDUGALD McLEAN

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A

Primer and Philosophy

FOR

Patient and Public

BY

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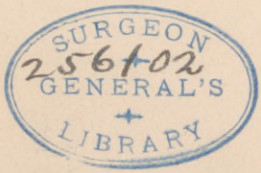
[Revised ed.]



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To
E. W. M.
and
S. W. M.

"I marvel that God made you mine,
For when He frowns 'tis then ye shine."

Lanier

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PREFACE TO SECOND EDITION

The usefulness of Doctor McLean's primer and philosophy on tuberculosis has been so amply demonstrated in the first edition that the publishers have decided to issue a second edition with the consent of the estate of Doctor McLean.

Dr. McDugald McLean made a valiant fight against tuberculosis, but succumbed to the disease in 1922.

It is the sincere wish of the "Journal of the Outdoor Life" that this volume receive a wide reading by physicians and tuberculosis patients.

PHILIP P. JACOBS.

March 20, 1924.

PREFACE TO FIRST EDITION

The purpose of this little volume is to give the patient something that will interest and encourage him, and at the same time include such general information as he and the public should have—a summary of the best opinion and advice of our leading specialists, digested by six years of experience as a patient and assistant, and a careful study of the current literature and standard texts on the subject.

In no sense is it intended to take the place of the doctor. It would be disastrous to give the patient any set of rules and let him attempt to direct his own case. There are three things in the treatment of tuberculosis: Rest, Morale and Advice—and the last should be first. Without it the patient is like a mariner without a compass, a blind man trying to cross Broadway at 42nd Street. If the reader gets the idea from these pages that the first duty of a "t. b.," and the safest and cheapest course, is to seek the advice and direction of a competent specialist, this little book will be amply justified.

My experience with tuberculosis has been varied, and has extended over a period of six years now, and into California, New Mexico, New York and Asheville. During this time I had ample leisure to meditate upon tuberculosis from the viewpoint

of a patient and a doctor, and to witness the ebb and flow of individual and sanatorium morale, the tragedies and the triumphs in the chase of the cure, and to take part in that life both as a patient and as an assistant in the sanatorium. In Part II I have recorded some observations and reflections from these experiences.

I hope that this little volume may be of some practical help and encouragement to the many patients going through "the course," and that it may help to spread the information that is necessary for the prevention of this disease. When every one is thoroughly awake to the situation that tuberculosis can be more EASILY and SUCCESSFULLY and CHEAPLY PREVENTED than CURED, a big advance toward this end will have been made.

McD. McLEAN,
Asheville, N. C.

PART I

A PRIMER OF TUBERCULOSIS

I

WHEN AND HOW WE GET OUR INFECTIONS

"Keep out of indoors."
—KOONS.

When. A summary of the best evidence on the infection with tubercle bacilli indicates that about 75% of people who have reached the age of fifteen years have been infected. This does not mean that 75% have been sick in bed with tuberculosis. A large majority of this 75% are entirely unaware of such infection, which is revealed only by a positive tuberculin reaction. Practically 100% of those who live to be thirty years old receive such infection. In the first year of life positive tuberculin reactions are found in about 9%, by the fifth year in about 45%, by the tenth year in about 66%, and by the fifteenth year in about 75%. These figures are based on city inhabitants and largely the poorer classes. They would undoubtedly be lower for the better classes and rural population.

Infection and Disease. It is, perhaps, well to point out here the difference between infection with tubercle bacilli and the clinical disease tuberculosis.

The former may occur without producing symptoms sufficient for the one affected to be aware of it, and the infection may be so successfully overcome that it will never cause any trouble. By clinical tuberculosis is meant the disease with manifest symptoms of fever, cough, loss of appetite and weight, etc.

Most Dangerous Period. A large majority of people who break down with clinical tuberculosis do so between the ages of eighteen to thirty years. A sharp rise in the mortality from tuberculosis occurs at the age of puberty. That this new physiological strain is a factor is indicated by the fact that the rise occurs earlier in girls than in boys, corresponding with puberty in the two sexes. The period from 18 to 30 years is one of strenuous life, dissipation and excesses in various forms, physical and mental overstrain in beginning business and professional careers, and worry over initial failures. It is this physiological and physical strain and mental stress and anxiety that cause so many breakdowns during this period of life, when resistance is lowered and the old foci of infection are fanned into activity by these unusual hardships.

Tuberculosis is a very deadly disease in infants. While only about 15% react positively to tuberculin in the first two years of life, the mortality rate is so high (75 to 80%) that the actual number of deaths equals, or exceeds, that of any other year of life. In adults positive tuberculin reactions are

found in 75 to 100%, but the mortality rate has dropped to about 25%. There is a sharp fall in the annual death rate with the third year of life and it continues to fall till about the fifteenth year, when there is a sharp rise at the age of puberty. This rise continues to about the twentieth year when the number of deaths again equals that of the first two years. From the twentieth to the forty-fifth year the annual rate is high and about equal to that of the first two years. From the third to the twentieth year the average rate is about one-third that of the first two years and that of the twentieth to forty-fifth years.

How. Infection takes place through exposure to tubercle bacilli. The bacilli gain entrance into our bodies in three ways:

(a) Breathing air which has been contaminated by the spray from coughing and sneezing of tuberculous patients, and from the dust of dried tuberculous sputum.

(b) Drinking infected milk and eating infected food. The milk may come from a tuberculous cow, or it may be infected from outside sources, as food is, by flies, dirty fingers, coughing over it, etc.

(c) Other sources of infection such as inoculation through abrasions of the skin and wounds are probably responsible for a small percentage of cases.

It is estimated that about 92% of the infections come from man to man, and about 8% from tuberculous cows.

Primary Infection. Primary infection from the gastro-intestinal tract is estimated to occur in as high as 25% of cases. About half of the infections from the intestinal tract are caused by the bovine bacillus and about half by the human bacillus. Inhalation infection probably accounts for most of the remaining cases, although recent investigations indicate that the ingestion method and inoculation through abrasions of the skin are probably more frequent sources than generally considered.

Congenital Infection and Heredity. Congenital infection is very rare, and comes from the mother through a tuberculous placenta. Tuberculosis is not inherited. There is no evidence that it comes from the germ plasm, or that it is transmitted from the father. On the contrary, there is good evidence that children of tuberculous parents inherit an increased resistance to infection, as far as any specific inheritance is concerned. One will naturally ask then, why do children from tuberculous families develop tuberculosis more often than those from non-tuberculous families? The answer is because they are much more frequently and constantly exposed to infection by careless and ignorant parents and other relatives.

No Absolute Immunity. There is no absolute immunity to tuberculosis in man, although a relative racial immunity seems to be well established, especially among the Jews and other white civilized races that have been in contact with it for many centuries.

It is now established that the first seat of disease is in the lymphatic glands, where the bacilli may lie for many years. If the number and virulence of the bacilli are sufficiently great, or if the resisting power is unusually low, disease may follow infection in a short time; otherwise, complete healing may take place without the development of any recognizable symptoms.

Local Disposition and Constitutional Predisposition. Certain factors and diseases render the lungs and various organs and parts of the body more susceptible to the development and spread of tuberculosis in them, and they are included in the term "local disposition." Chief among such factors are: (1) prolonged physical and mental overstrain; (2) under-nutrition and unhygienic surroundings—long residence in poorly ventilated quarters greatly lowers resistance; (3) measles, whooping cough, and influenza; (4) diabetes; (5) pregnancy.

A constitutional predisposition or tendency to develop tuberculosis in certain types of individuals and families has been noted for centuries. The in-

dividual with the *habitus phthisicus* is described as pale, thin and feeble, with frail bony framework, long, narrow and flat chest with wide intercostal spaces, and a small heart and aorta. Such a person, however, is prone to develop not only tuberculosis, but also any other infectious disease to which he is exposed. The inheritance of such nutritional faults and malformation of the bony framework and poor development of the heart and blood-vessels cannot be considered as a specific inheritance of a tendency to tuberculosis any more than a tendency to various other infections. And there is no conclusive evidence that children of tuberculous parents inherit the *habitus phthisicus* in a higher percentage than children of non-tuberculous parents.

Exposure to Infection. It is probable that infection rarely, or never, occurs in the open, hence tuberculosis has been aptly called a "house disease." Frequent contact, on the part of children, with tuberculous persons who are careless in their habits and toilet, and who live in unhygienic quarters, leads to multiple re-infections and is of great importance in the development of the disease. It is doubtful, however, that this is an important factor in the case of adults. Doctors, nurses, and attendants at tuberculosis sanatoria do not develop tuberculosis any more frequently than they do in other fields of activity. An extensive investigation

of married couples, where one of the partners is tuberculous, revealed the fact that there is no higher incidence among the non-tuberculous partners than there would be in a similar group of the general population. Clinical tuberculosis in adults comes chiefly from an old focus of infection which is lighted up by some over-strain, malnutrition, or other infection. The fact that the great majority of our soldiers who developed tuberculosis did so within a month or two after entering upon active duties shows that old foci were fanned into activity rather than that new infection was acquired, for this is too short a time for new infection to reach the stage of clinical disease.

Dr. E. R. Baldwin* summarizes present views on infection as follows: "The doctrine of inherited or acquired susceptibility is in doubt . . . all infants are susceptible, and susceptibility lessens with increase in age; adults are comparatively insusceptible when without general or local lowered resistance and repeated or prolonged exposure. As to sources of infection . . . the sputum is of overwhelming importance . . . cow's milk is an important factor . . . mother's milk, the urine, feces, and other excretions of tuberculous invalids are not frequent sources of infection. As to means of transmission there is a growing belief in the importance of infected food, especially milk, for infants and children rather than for adults;

. . . to adults dust and coughed spray are of more importance than infected food. . . . Pulmonary tuberculosis is often secondary to the lymphatic form (glandular) contracted in early life. . . . It is doubtful that a second infection from outside the body is a frequent occurrence after clinical healing of pulmonary tuberculosis in adults; . . . "

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*Modern Medicine, Osler and McCrae, Vol. I, p. 338.

II

THE BACILLUS AND THE LUNG

"It is not what you have in your lungs but what you have in your head that determines whether you will get well or not."

—"SAN SAYING."

The Tubercle Bacillus. The tubercle bacillus is a microscopic fungus, or plant, about one ten-thousandth to one five-thousandth of an inch long, and one-fifth to one-fourth as broad. It is rod shaped and motionless, and is a strict parasite, not having a habitat outside of man and animals, though it may exist for months in nature. It multiplies with great rapidity by dividing into two parts again and again, many millions being formed and expectorated daily, and produces poisons which kill the tissues around it. A healthy body is not favorable soil for the bacilli to grow in, but they may lie inactive in glands within the chest and in scar tissue surrounding old foci of infection for a long time (practically indefinitely) and then begin to multiply and grow again when by some chance such as prolonged over-strain, poor nutrition, etc., the tissues become favorable soil again. A striking peculiarity of this plant is the fact that light kills

it. It can remain alive and virulent for many months in darkness, dampness, dirt and cold, but it has not the "character" to endure exposure to light, and succumbs within a few minutes to a few days, depending on the degree of light.

Structure and Function of Lungs. In order to explain better the soil in which the bacilli grow, I give a brief description of the structure and function of the lungs, the scene of activity in pulmonary tuberculosis.

Man is endowed with a pair of lungs. The right one normally has three lobes and the left two, but the two lungs are about the same size and weight. They are covered by a thin tissue called the pleura which is reflected back over them from the chest wall which it also lines, and so forms a blind sac called the pleural cavity. The windpipe, or trachea, extends from the back of the throat down the middle of the chest and gives off a main branch, or bronchus, to each lung. These bronchi in turn give off many smaller bronchi, like the branches of a tree, and finally the innumerable smallest branches, called bronchioles, each terminating in a bunch of air cells, called a lobule, which is regarded as the unit of lung structure. These lobules are very tiny, about one two-hundredth of an inch in diameter, and there are millions of them. Their walls are composed of a very thin but tough layer of tissue, and are surrounded by a network of capillary blood vessels. Here the respiratory

exchange takes place, when the oxygen of the inspired air is exchanged for the carbon dioxide in the blood. This exchange takes place in accordance with the physical principle known as osmosis, *i.e.*, the percolation and intermixture of gases or liquids through permeable walls.

The normal individual inhales about one hundred and fifty gallons of air per hour, and the heart pumps about a hundred gallons of blood through the lungs in the same length of time—a marvelous performance and mechanism which deserves far more consideration than usually accorded it, especially when handicapped by tuberculosis!

III

THE NATURE OF THE DISEASE

"So gird up your hopes—
He loses who mopes."

—FORBES.

Tuberculosis differs from most other infectious diseases, such as small-pox, typhoid fever, pneumonia, etc., in that these diseases run a definite and limited course, usually a few weeks, and then the patient is either well or has begun a new life in the next world. Not so, though, with tuberculosis! The tubercle bacilli are able to live in our tissues indefinitely, and when the chance comes, to spread to other tissues and organs and set up clinical tuberculosis.

When infection occurs in the lung, tiny little nodules, or tubercles, appear which consist of cheesy masses of dead tissue and bacilli. Surrounding the tubercle is a layer of cells thrown out by the body to protect itself from the invading germ. If the poisons produced by the germs are sufficient to kill these cells, the disease spreads. Lung tissue thus destroyed is not replaced by lung tissue, but by scar tissue, which is the material

used by nature in the repair of all tissues. One may lose the use of five-sixths of the lung tissue and still live, such is the margin of safety with which we are endowed.

Nature's Defense.—Nature attempts to isolate and wall off the bacilli and focus of infection as follows. At first she throws an area of inflammation around the focus, as stated above, and this is later replaced by a wall of scar tissue which, if successfully established, completely checks the disease and holds the bacilli under control. In some cases that do not advance very far the bacilli may be killed and the focus of infection absorbed, leaving only a tiny scar. In other cases nature deposits lime salts around the focus which later become calcified and form little stony walls about the focus, or replace it with stony formation, which Dr. Lawrason Brown has called the "grave-stones" of the dead bacilli.

Slow Process. The formation of this scar tissue is a slow process, and this is why the tuberculous patient must be so careful about rest and exercise even many months after the cessation of such symptoms as fever and cough, as it requires at least a year or two for this scar tissue to become strong enough to withstand the ordinary strains of life put upon it. In the beginning the formation of this scar tissue is a spider web affair, or like the formation of ice upon a pond. If the pa-

tient has severe coughing spells, or exercises too much and thus increases the respiratory movement and blood pressure, the fibrous tissue strands are broken and the formation of the scar tissue is delayed and made uneven and excessive in amount, as the formation of the ice on the pond is disturbed by the ripples and waves.

Immunity. Nature also elaborates certain substances in the cells and tissue juices of the body which tend to check the growth of the bacilli and to kill them. The nature of these substances is not yet clearly understood. Upon them depends the relative degree of immunity which is established in tuberculosis. In smallpox and typhoid fever, for instance, the immunity established is complete, and the patient has these diseases only once. In pneumonia, for example, there is apparently no immunity established, or rather it is very transitory, and the patient may suffer from frequent attacks.

Koch discovered the significant fact that if an animal is infected with tuberculosis, and later a second inoculation made, the focus of infection from the second inoculation remains localized, ulcerates, sloughs out and heals, leaving only a scar, and does not spread to the underlying lymph glands and other tissues as the first infection always does. This clearly shows that the first infection produces a certain amount of immunity which is able to

prevent the spread of subsequent infections, but is not sufficient to control the original infection.

This experiment led him to the discovery of tuberculin, and the attempt to produce immunity by giving tuberculin treatment, but such attempts have yielded small results so far.

Tendency to Relapse. Tuberculosis is a disease which tends to relapse. This occurs when some over-strain or infection, etc., is able to fan the old foci into renewed activity, or when through lowered resistance the bacilli are enabled to invade new areas. Hence a person who has been "cured" should not consider himself as entirely free from living bacilli. This should be no cause for worry, but rather looked upon as a "safety first" reminder, for it is not incompatible with the enjoyment of health and activities.

Infants, Children, Adults. In infancy the most common form of tuberculosis is generalized miliary tuberculosis and tuberculous meningitis, and is practically always fatal. In children tuberculosis of the glands, bones and joints is the common form, and chances of recovery are excellent if proper care and treatment are carried out. In adults pulmonary tuberculosis is by far the most common form. It has a pronounced tendency to become chronic, is certainly amenable to treatment, and the earlier the treatment is begun the better are the chances of recovery.

IV

DANGER SIGNALS

"Let thine ear now be attentive, and thine eyes open."

"The prudent man foreseeth the evil and hideth himself; but the simple pass on and are punished."

Wisdom and Folly. Tuberculosis, in a large majority of cases, comes on gradually and insidiously, and there are signals, as a rule, months ahead of the "breakdown," to warn us if we have our ears attentive and eyes open, as the writer exhorts us in the quotation above. It is upon these warning signals that I wish to dwell for a few pages now, and to emphasize the wisdom of heeding them, and to point out the folly, loss of time and money, and disastrous results that may ensue if we refuse to give ear to them, and fail to seek and follow the advice of a physician competent to direct in these matters.

It is of the greatest importance to realize that if tuberculosis is taken in hand at the time of these early warnings a serious "breakdown" can be prevented, and a complete arrestment of the disease

obtained in a few months of proper treatment in as high as 80 or 90% of cases, while if one waits until the break comes, the period of treatment is three to ten times as long and the results obtained much less satisfactory. And yet there are many who, when aware of these early symptoms, say that they just can't afford to stop and take a few months off, when the most elementary considerations of finance and prudence should convince them that they can ill afford *not* to do so. On the one hand, the law of chances that they will not break down is strongly against them, and on the other hand the chances of averting the breakdown and replacing their health on a stable foundation are overwhelmingly in their favor. If we could get such favorable odds in any financial adventure, there would be a headlong rush for them; but when "health" is the stake, we develop indefensible and simple-minded nearsightedness and stumble along at a snail's pace toward the goal.

It is not my desire to disturb the mental equilibrium of nervous types of individuals by reciting the early symptoms of tuberculosis, but if I can scare some into having an early diagnosis made, and treatment begun, the result will far outweigh any groundless fears that may be aroused.

Early Symptoms Obscure. The earliest symptoms of tuberculosis are by no means always easy to recognize and identify. The patient may not

be aware that anything is wrong more than a vague feeling that things are different from what they used to be. If he is asked the question, "How long has it been since you felt perfectly well?" he will often be surprised to discover that it has really been months, or even years.

To enumerate more specifically, we may mention the following symptoms which should arouse suspicion:

(1) Change of mental attitude—more irritable disposition—tendency to be upset and worried by small things which formerly would not disturb your equilibrium.

(2) Lack of endurance with slow recovery from fatigue.

(3) "Don't care" attitude—tasks that were formerly easy and pleasant become difficult and uninteresting.

(4) Capricious appetite, with unexplainable loss of weight of five or ten pounds.

(5) Unstable pulse of 85 or more in men, and 90 or over in women.

(6) Frequent colds which "hang on" and slow recovery from other diseases. Symptoms of tuberculosis are apt to appear for first time during such periods.

(7) Cough which persists for a month or more.

(8) Temperature of 99.4 or over on several successive days.

(9) Spitting of blood which does not definitely come from nose or mouth nearly always indicates tuberculosis.

(10) Pleurisy which is not definitely associated with pneumonia or an injury is practically always tuberculous.

(11) Fistulae are very often of tuberculous origin.

(12) Unexplainable hoarseness.

(13) Enlarged glands, especially in children.

(14) Exposure to infection, especially in childhood.

(15) Night sweats.

Many of these symptoms, of course, appear in other infections and diseases, but if a definite and undoubted diagnosis cannot be made, tuberculosis should be suspected and carefully looked for.

Classification of Symptoms. Dr. Pottenger* has very conveniently arranged the symptoms of tuberculosis in three groups as follows:

(1) *Symptoms due to toxemia*

Run-down feeling
Lack of endurance
Loss of strength
Nervous instability
Digestive disturbances
Loss of weight

*Pottenger, F. M.: Clinical Tuberculosis, C. V. Mosby Co., 1917.

Increased pulse rate
Night sweats
Fever
Blood changes

(2) *Reflex origin*
Cough
Pains in chest and shoulder
Digestive disturbances
Circulatory disturbances
Flushing of face

(3) *Tuberculous process per se*
Frequent and protracted colds
Pleurisy
Haemoptysis
Sputum
Hoarseness
Fever

Feelings Deceptive. The toxic symptoms are usually the first to appear, and also to disappear. It is this group of symptoms which make the patient realize that he is sick. It is important to know that active tuberculosis may be present without manifesting toxic symptoms, at least symptoms that the patient will recognize; and also to realize that the patient is not well as soon as these toxic symptoms disappear, although he may feel perfectly well. It takes much longer for the other two groups of symptoms to disappear, and for healing to take place in the lungs.

Forms of Tuberculosis and Mistakes in Diagnosis. Tuberculosis assumes various forms and may often be mistaken for other diseases, especially in the early stages. (1) Catarrhal form—this is probably the most frequent source of mistaken diagnoses—often diagnosed as colds, bronchitis, colds in the chest, etc. (2) Febrile, or malarial form—often diagnosed, especially in malarial districts, as malaria. (3) Dyspeptic form—may be called indigestion, etc. (4) Pleuritic form—importance of pleurisy is often minimized; patients are told they will be all right in a week or two, or that they are threatened with tuberculosis, when in fact they have it. About 90% of all cases of pleurisy are tuberculous, when not associated with pneumonia. (5) Anaemic form—may be diagnosed as anaemia, or as chlorosis in girls and women. (6) Nervous form—often called neurasthenia. (7) Laryngeal form—may be passed over as sore throat, or simple laryngitis. (8) Haemoptotic form—as in the case of pleurisy the patient may be told that a little spitting of blood does not amount to anything, that he is all right, when in fact it is the herald of tuberculosis. (9) Traumatic form—tuberculosis sometimes develops at the site of an injury.

It is impossible to over-emphasize the importance of early diagnosis and treatment in tuberculosis. If your family physician is in doubt about the diagnosis, don't hesitate to consult a specialist.

V

GOOD AND BAD ADVICE

"When a man's knowledge is not in order the more of it he has the greater will be his confusion."

Pleasant vs. Good Advice. All shades and qualities of advice can be had for the asking—and often without the asking. Ignorance of the issues at stake does not restrain these voluble advisers from proffering their well-meant but misdirecting and meddlesome advice with great assurance and insistence. Ne'er-do-wells and failures in all walks of life are notorious advisers. One danger from such advice is the tendency to accept it when it coincides with our whims and pleasure in preference to the best advice, which may not be so convenient and pleasant to take.

Groundless Advice. The habit of laymen, especially "ex-t.bs.," of giving advice to tuberculous patients when they are absolutely ignorant of the pathology and physiology of the disease, and especially of the patient's physical condition, is a pernicious one. Truly, in this province, "fools rush

in where angels fear to tread." Such advice is nearly always based on the fact that they know Mr. A. who did so and so, or went to a certain place, and either got well or didn't get well. When we consider the fact that many patients get well in spite of numerous follies and dangerous practices, and on the other hand that many die under the very best treatment and conditions, it should be evident that the few cases which come within the ken of the laymen should really have no influence in the matter.

Physicians and Advice. All physicians, unfortunately, are not qualified to give good advice—certainly not the best advice—in tuberculosis. Dr. Pottenger says, "The general apathy of the profession toward tuberculosis, and neglect to study it as its seriousness and frequency deserve, lead to a lack of confidence in their ability to diagnose and treat it satisfactorily." And some make this situation worse by neglecting to send doubtful cases to a physician who has made a careful study of the disease and understands it thoroughly. It is a deplorable and inexcusable practice to lull the patient into a false security by telling him that there is nothing the matter, that he is just in a run-down condition, or has weak lungs, etc., while waiting for absolutely unmistakable physical signs and the appearance of bacilli in the sputum. Such a course reduces the patient's chances from 80 or 90% to

50 or 60%. Dr. Elsner* has stated the situation as follows: "To wait for definite physical signs (in tuberculosis) before making a diagnosis darkens prognosis, for the patient's chances are reduced thereby. To anticipate the final development in cases which are strongly suggestive adds to the patient's chances. Positive physical signs are never early evidence of lung infection; they mean that the case is advanced." Cheap advice which leads to delayed diagnosis and mistakes in treatment proves in the end to be very dear.

Sanatorium or Home Treatment? One of the first and most important questions to be decided is whether the patient should be treated in a sanatorium or at home. Rules cannot be laid down for all cases. It must be decided separately for each case, and the advice of an expert should be sought in the matter. In general it may be said that, if other things are equal, the sanatorium offers twenty to thirty per cent better chances than the home, and possibly even higher percentages in some cases. Advice in this matter depends on: (1) stage and duration of the disease; (2) financial condition; (3) temperament, habits, social condition, family ties of patient; (4) age.

It is manifestly unwise to send a hopeless case

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*Monographic Medicine, D. Appleton & Co., 1916. Vol. VI.

to a distant sanatorium, and yet this is by no means an infrequent occurrence. Infants are best treated at home. Children do best in special institutions where there are arrangements for amusement, suitable instruction, and careful supervision. People over sixty do not adjust themselves to sanatorium regime without considerable friction and often needless irritation. Finances and temperament are important considerations. It is unwise to send an unwilling patient away from home to worry over his finances and worry over the separation from his family.

On the other hand, the freedom from home cares and interruptions, and temptations of friends, and tendency to stop the regime of treatment too soon at home, and especially the educative features and daily visits and encouragement of the physicians are distinct advantages of the sanatorium. The "atmosphere" is congenial and sympathetic, and the patient is not made to feel uncomfortable by well "friends" who are a bit timid and over-cautious about their own safety, or thoughtless and selfish in their attitude toward him. Everybody is doing the same thing and this makes it easier for him to do it. New friends and faces, constant changes, and the daily routine make the time pass rapidly. He sees the mistakes and follies of some that cause relapses and prolong the cure, and he has the association and example of others who are improving

and leaving as "cures" to stimulate him to put up his best fight.

Specific Directions. Specific directions as to rest and exercise, diet, symptomatic treatment, etc., must come from the doctor in charge of the case, and they will vary according to the stage and progress of the disease. No course of treatment can be outlined for three or four months in advance, and the patient sent off into the wilderness with a camping outfit to regain his health. The patient should have constant medical supervision and encouragement, and the symptomatic treatment must be changed from time to time to meet whatever demands may arise.

The defeatist attitude, or *laissez faire* policy, of some physicians and patients is pernicious and will reduce one's chances to about half of those offered by a vigorous and persistent plan of treatment instituted at the earliest possible moment.

Arrestment of Disease and Change of Occupation. It is important to realize that no patient can be considered "cured" in less than two years after the disappearance of symptoms. The question of occupation then arises. Can he safely return to his old one, or should he take up some outdoor work? As a rule, it is much better to return to the old one, unless it is a peculiarly unhealthful or laborious one. It is a mistake to change from easy congenial work to something out of doors for

which the patient has no aptitude, and which usually involves a decrease of income and increase of worry and dissatisfaction. His occupation will take one-third, or less, of his time. His outcome will depend more on the judicious use of the other two-thirds, or more, of his time as regards rest, amusements, meals, etc. On this subject Dr. David A. Stewart, of the Manitoba Sanatorium, has laid down the following general principles:

(1) Work for those with arrested disease must not be physically heavy.

(2) Possibly the most deeply rooted wrong idea concerning work for tuberculous persons is that outdoor occupations are essential.

(3) It is particularly desirable that a tuberculous person should earn a good wage so as to make good living conditions possible.

(4) A tuberculous patient needs a permanent occupation.

(5) If at all possible, it is better for a man to return to his old occupation, or some modification of it.

(6) A suitable job for a tuberculous patient should be one which makes it possible for him to live at his own home.

General Advice. (1) Be hopeful and cheerful, for your disease is curable. Avoid worry and

anxieties which prolong, and may prevent, the cure.

(2) Do not tell all your troubles and fears to the other patients and people, and dwell on and magnify them in your own mind. They have troubles enough of their own, and such thoughts and conversations are depressing. The doctor is the proper one to hear such complaints, and to advise accordingly.

(3) Stay in the open air and sunshine as much as possible. Protect your head from the direct rays of the sun and never remain in the sun until you feel weak, faint, or enervated; and do not allow the sun to run up your temperature by staying in it too long at a time. In cold weather wrap up carefully and do not allow yourself to become chilled while sitting or sleeping out.

(4) Never sleep or stay in a hot, close room, and do not shut out the night air—it is generally purer than the day air. Maintain the best ventilation possible both day and night, and let in all the light possible.

(5) Protect yourself from cold damp winds and draughts, but do not close up your room in order to accomplish this—use wind shields or screens.

(6) Dress comfortably, and avoid any excess of heavy clothing. It is advisable to wear linen-mesh underwear next to the skin in order to insure good ventilation. It is much better to put on warm outer

garments than under garments. Keep your feet dry and warm.

(7) Harden yourself gradually to outdoor conditions and you will be in much better shape to resist colds and other intercurrent infections.

(8) Do not eat when you are tired and worried, and do not hurry through the meal. Rest for half an hour before and after the principal meals, and this will aid both the digestive and mental processes.

(9) Never allow yourself to become tired. Always stop and rest at the first symptoms of fatigue, either mental or physical. Avoid hurry and strain of any kind.

(10) Sleep nine hours or ten every night, or at least lie in bed that long. If you cannot sleep all this time, do not worry about it, but lie in a perfectly relaxed condition, physically and mentally, and you will get all the rest that you require. Such a relaxed condition is also a much better soporific than any drugs.

(11) Do not take any medicine (patent or other) unless prescribed by your doctor; and discontinue any medicine that interferes with your appetite and digestion.

(12) Control your cough as much as possible. Unnecessary and violent coughing is harmful. A determined will-power and persistent effort can ac-

complish much toward this end. I can testify that the will-power, stimulated by pleurisy, is a most effective remedy for controlling a cough. It makes no difference how strong the desire may be, if the pleurisy is severe enough the cough will be reduced to a mere aspirating grunt. Exercise your will-power independently of pleurisy!

VI

MORALE

"Moral condition as regards discipline, confidence, indecision, courage——"

—DICTIONARY.

"He that ruleth himself is greater than he that taketh a city."

—SOLOMON.

Morale is one of those things, like electricity, which is frequently mentioned, but not fully comprehended. When it is low, things go wrong, nobody seems to take any interest or care about you, you are worried by trivial things, listless, diverted from your objective—you have a "rotten day." When it is high, you get on well with everybody, speak an encouraging word or do a kindness to someone, note some progress; on the whole there is a feeling of satisfaction with your efforts and a determination to do better tomorrow—a "good day." It is a storage battery of nerve force, a surplus of confidence and purpose on deposit, a reserve fund of discipline and courage which makes

your supply exceed the demands of the day. It imparts decision to action, firmness of will, radiates vitality—it is the mainspring of success.

Important Factor. It is just as important a factor for the patient as it is for the soldier. We have seen what a tragic spectacle Russia has presented by allowing the morale of her army and of her people to be completely undermined. And we read in the dispatches from Austria that the morale of the people was so low that the Government feared Bolshevism; and again that the German Military Staff had undertaken some costly feat in order to keep up the morale of the people. As soon as the Germans believed that they were not going to win, they went to pieces. Calculations based on a military point of view prophesied victory late in 1919 or in 1920, but they failed to consider the effects of morale. In defeat the Allied morale was stubborn and inflexible, but when the Germans faced defeat their morale crumbled, and the end came quickly. When a doctor sees the morale of his patient ebbing away, and discontentment, worry, peevishness, and fear gaining ground, he should be just as solicitous over his patient as the Allies were over Russia, for the patient stands just about as much chance against the invading bacilli as the Bolshevik army did against the invading Germans.

Evil Effects of Worry. It is of the greatest

importance that the patient be aware of the evil effects of worry, peevishness, and a fault-finding habit. He is not playing the game fairly under such conditions, and does not put himself in position to receive the best results from any form of treatment. A spirit of healthy-mindedness, optimism, and courage is a great asset, and one that should be assiduously cultivated. Health of body and mind act and react on each other—"a merry heart doeth good like a medicine."

Serenity. Serenity sums up the qualities of mind which the patient should aim at, and it is an art that can be attained and improved by practice. The secret of serenity is the ability to control our attention. One can attain the ability to turn off the current of his thoughts as he would turn off the electric light. And when his thoughts turn toward despondency, grief or morbid fears, he should turn off this current and turn on a current of cheerfulness, courage, patience, and optimism. The little Sunday-school song, "Count your blessings, name them one by one," is a good way to accomplish this.

Religion and Philosophy. William James, the great psychologist, has said that we should cultivate and practice a religion of healthy-mindedness, courage, patience, optimism, and reverence. We should certainly have some religion and philosophy which will serve as light-houses to keep us out of

the Slough of Despond. The philosophy of the Bible, of Marcus Aurelius, of Emerson, is an excellent tonic of mental hygiene.

One Day at a Time. There is a tendency for many patients to cross their bridges before they get to them—to suffer many things in their minds that they are never called upon to endure. This is not only useless and foolish worry, but it exerts a bad influence on the course of the disease by its depressing action on the physiological functions of the body. A good way to avoid such unnecessary worry is to live one day at a time, or if necessary one hour at a time. We can gradually gain self-control and confidence in this way, remembering the adage, "the more haste, the less speed." We should learn to pass our crises unruffled, no matter what happens, and then we shall be much more apt to pass them successfully.

Physiological Effects of Emotions. The effect of emotions on the nervous mechanism of the body is well known. Shame or embarrassment causes a dilatation of the blood-vessels of the face with a rush of blood into the dilated vessels, and the result is known as blushing. Fear produces the opposite effect, a constriction of these blood-vessels, with a resulting pallor of the face. A shock may produce fainting by causing a dilatation of the abdominal vessels with a rush of blood away from the brain into these dilated vessels, and the result-

ing anaemia of the brain is responsible for the fainting. Grief or joy may cause a flow of tears which come from little glands situated just above the eyes and are due to the nervous stimulation by these emotions. Sudden news, good or bad, may cause a complete loss of appetite temporarily. Worry has a very marked effect on digestion by exerting a depressing effect on the glands that supply the digestive juices to the stomach and intestines. Most interesting and instructive experiments have been done on animals in which it has been observed that such emotions as fear and anger may cause a cessation of the peristaltic movements of the intestines, which are very necessary for the proper digestion of food and functioning of the intestines.

Cause of Depressive Emotions. Robert Burton, in his Anatomy of Melancholy written in 1661, gives an amusing account of the search for the cause or seat of melancholy, or depressive emotions. Various insects and small animals with supposedly morose dispositions were dissected in the effort to locate the cause of these emotions. Now we are aware of the fact that the toxines and poisons produced by various infections and diseases may produce these depressive emotions by their action on the nerve centres. It is therefore all the more necessary for the tuberculous patient to exert a greater effort to be cheerful and agreeable to

those about him, and to strengthen his will-power (by using it) in order that he may overcome this added tendency to depressive emotions and peevishness which comes from the toxines of his disease. A cheerful, optimistic, courageous disposition will more than offset the effect of the toxines on his physiological functions in most cases.

Toxic Effects Increased by Depressive Emotions. One effect of toxines is to produce an inhibition of the functions of the internal organs, and this effect is increased and prolonged by such depressive states as pain, anxiety, fear, disappointment, discouragement, and general nervous depression. We repeat again that hope, cheerfulness, contentment, and a whole-hearted co-operation on the part of the patient are very important factors in the prognosis of any case.

Self-Control. Dr. Lawrason Brown sums up the situation as follows: "After all, the most important thing is to be able to control one's self. If a man does not develop self-control while he is 'curing' so that when he is asked to do things he knows he should not, and to which he cannot say no, then this time has been lost. Unless a patient can say no when the occasion arises, his chances for getting well are very slight. He can tear down in one day or in an hour what it has taken him months to build up."

"He that ruleth himself is greater than he that taketh a city," and incidentally he is in much better shape to "take the city."

"To look up and not down,
To look forward and not back,
To look out and not in, and
To lend a hand."

VII

PREVENTION AND CURE

"It may well be claimed that the care of individual and family health is the first and most patriotic duty of a citizen."

—TAFT.

"To successfully combat consumption as a disease of the masses requires the combined action of a wise government, well-trained physicians, and an intelligent people."

—KNOPF.

Is it possible to relegate tuberculosis to the background as smallpox and yellow fever have been? Tuberculosis, the greatest scourge in all history! When everyone is thoroughly awake to the situation that it can be much more easily and cheaply prevented than cured, and translates present knowledge of the subject into action, a big advance toward this end will be made. The results of preventive measures are incomparably better than the patch work and repair of manifest disease. Hospitals and almshouses are much more expensive institutions to support than would be the

necessary measures and personnel to enforce effective prevention. And how much better it is for the individual to be able to support himself than to be an object of charity!

When the tubercle bacillus was discovered in 1882, many prophesied that tuberculosis would be a back number in one generation. This prophecy has not been fulfilled, neither have the very simple conditions laid down for the eradication of tuberculosis been carried out. And so the possibility of eradicating tuberculosis still remains, though somewhat disfigured by inadequate effort and doubts, and still lacking the education, means, and legislation necessary to give it a fair trial.

Pasteur, the great French scientist, said: "It is within the power of man to rid himself of all parasitic diseases." The wonderful results that have been obtained from preventive measures in such diseases as smallpox, yellow fever, typhoid and dysentery in the army, typhus epidemics, and malaria add confirmation to his statement. The disease death rate per thousand per year for wars in which the United States has engaged in recent years shows the following remarkable drop due to the discovery and enforcement of preventive measures in the army. Mexican War, 110 per 1000; Civil War (North), 65 per 1000; Spanish War, 26 per 1000; World War, 17 per 1000. Such achievements surely add color to the reality of this pos-

sibility, and should stimulate efforts to give it a thoroughly fair trial.

The prevention of tuberculosis essentially falls under two heads: (*A*) prevent infection from taking place; (*B*) after infection has occurred prevent it from becoming clinical tuberculosis. In view of the fact that under present conditions 75 to 100% of adults are infected, the latter consideration becomes the more immediate and practical, while the former remains the ideal.

(*A*) *Prevent Infection.* It is reasonable to suppose that this could be accomplished almost in one generation if every tuberculous individual would observe carefully the simple precautions:

(1) Never expectorate anywhere or in anything except waterproof cups that can be burned.

(2) Never cough or sneeze without holding a paper or gauze square over the mouth and nose; use the square only once, and then place it in a paper bag and burn bag and contents.

(3) Wash mouth, face, and hands frequently, and take care not to infect the food and dishes that children and associates use.

This would account for about 90% of tuberculosis. The other 10% comes from cows, and the obvious remedy is to slaughter all tuberculous cows, and pasteurize all milk that does not come from tuberculin tested herds.

A House Disease. It is well recognized now

that tuberculosis is essentially a house disease, and is probably never contracted in the open. Direct sunlight is the best disinfectant that we have, and also the cheapest, therefore we should make the greatest possible use of it. Dark, damp, dirty, and poorly ventilated rooms and houses should not be tolerated. Tubercle bacilli can live in such rooms and remain virulent for many months, whereas in strong direct sunlight they are killed in a short time; in diffused or reflected light they die more slowly, depending on the degree of light. We go to Sunday school and sing "Let the blessed sunshine in" and then come home and shut it out, and further vitiate the atmosphere in our houses by cutting off all ventilation, and then turn on too much heat.

Light, Ventilation and Heat. The maximum amount of light, good ventilation, and not too much heat are not only excellent precautions against tuberculosis, but also against headaches, languor, colds, and all other infectious diseases.

Careless spitting and coughing furnish the material for the spread of infection; and poverty, insanitary surroundings, crowding, dissipation, and overwork are the bellows that fan infection into active disease. Infants and children who are exposed to such conditions have no chance of escaping infection; and adults who live under and tolerate them, especially during the period of life

(18 to 30 years of age) when clinical tuberculosis most frequently develops, greatly increase the danger of their old foci of infection breaking out into manifest disease.

Information, Perseverance and Legislation Needed. We know the cause of the disease, namely, the parasitic tubercle bacillus which cannot live very long outside of its animal hosts; and we know the sources of infection, namely, careless spitting and coughing, and infected cows and food. Some of us need only information on the above points; some lack the initiative and perseverance necessary to carry them out; and some need the restraining influence and forceful help of legislation, and even isolation.

The very simplicity of these measures confounds us, and we go on tolerating ignorance, carelessness, and viciousness, and look for a specific cure, when, even if we had the cure, the preventive measures which we now neglect would still be important and necessary.

(*B*) *Prevent Infection from Becoming Manifest Disease.* This is the immediate and practical problem that confronts us. The *Journal of the Outdoor Life* has laid down the five fundamental principles on which the control of tuberculosis must be based, namely:

(1) The discovery of the case and reporting of same to the health authorities.

(2) The facilities for the care and instruction of curable cases shall be adequate and shall be properly equipped and maintained.

(3 The segregation of the infectious and communicable case. On this point there is not unanimity of opinion, but all agree that isolation of the careless, dangerous case is a necessary health measure.

(4) The education and treatment of the non-infectious case by dispensaries, visiting nurses, etc.

(5) Education of general public, first, in regard to nature and prevention of tuberculosis, and, second, how to maintain a strong resistance to disease.

More specific measures include: (a) Preventoria for babies of poor or careless families in which they are exposed to massive infection and frequent reinfections which play an important part in the development of the disease. In these institutions and in private families that adopt these children for a few years as they do under the Grancher Society in France, these children are safeguarded against exposure to infection. (b) Fresh air schools and colonies for children that show evidence of tuberculous disease. Here, these children are assured of proper treatment and nourishment, and the amount of study and work that is safe for their physical conditions.

For adults a sane amount of restraint must be applied to their mode of living and activities, espe-

cially during the period of 18 to 30 years of age when the great majority of breakdowns occur. Dissipation, irregular hours, variable time, quantity, and quality of meals, overwork, high tension, and worry must be replaced by self-control, regular habits, sanitary living and working quarters, periodic health examinations, serenity, and healthful outdoor recreation if the more susceptible individuals are to pass this period safely.

Summary. We have stated that the dangerous period for acquiring tuberculous infection is in infancy and childhood, and that early clinical tuberculosis in adults usually comes from old foci of infection contracted in childhood. Therefore we should concentrate attention on the following:

(*A*) Prevent infection from taking place by protecting children from careless consumptives and suspicious cases who may be inclined to kiss and fondle them; keep them out of contaminated rooms, and by no means allow them to play and crawl around on such floors and put various objects in their mouths; do not let them take infected food and milk, or eat from dishes used by consumptives unless they have been thoroughly scalded. Under no conditions should a baby be nursed by a tuberculous mother or attended by a tuberculous nurse.

(*B*) When infection has occurred, give careful attention to the thorough cure and healing of the foci. Remember that this will take a year or two,

and must be followed by careful living, proper food, life in the open as much as possible—in short, maintain a high degree of resistance.

Enumeration of Preventive Measures. (1) Burn all sputum—most important—and all articles that come in contact with the mouth, such as toothpicks, fruit cores, cigar butts, etc.

(2) Always cover mouth and nose with paper or gauze when you cough or sneeze, and burn the squares—most important! This practice should also be observed in colds and other respiratory infections.

(3) Do not use infected food—at least in the raw state. If there is any question about the milk supply, it should be boiled or pasteurized, especially for children. If possible, it is much safer to use milk from tuberculin tested cows.

(4) Protect children from careless consumptives and contaminated rooms.

(5) Let in maximum amount of light, and always have good ventilation and not too much heat—not over 68 degrees.

(6) Sun the clothing and bedding of patient frequently; boil nightclothes and bedding when they are washed.

(7) Patient should wash his mouth, face, and hands frequently and use soap freely.

(8) Always use moist broom and cloth for sweeping and dusting in patient's room.

(9) Live hygienically; give attention to proper amount and cooking of food; avoid late hours, dissipation, and over-strain; employ leisure time in healthful outdoor amusement; keep "fit."

(10) Periodic examination for those in any way exposed to infection, and for under-nourished, weakly children.

(11) Early diagnosis and adequate treatment; never neglect a cold that hangs on, for it may be the beginning of tuberculosis.

(12) When a patient vacates a room, have it thoroughly cleaned as follows: first, fumigate with formaldehyde gas; then wipe down ceiling, walls, and floor with some antiseptic solution such as cresol, or liquor cresolis compositus; and finally give walls and floor a thorough scrubbing with hot carbolized soap-suds (two tablespoonfuls carbolic acid to quart of water); then open up room to maximum amount of light and air for two days. It will be perfectly safe after such treatment. If you move to another house, take care to find out if there have been any tuberculous inhabitants in it, and if so, whether it has been disinfected as above. Repapering, painting, varnishing, or calcimining the walls and ceiling are safe methods, but more expensive than the above measures.

Remarkable Progress. Hippocrates wrote more than twenty-two hundred years ago, "The disease which proved most dangerous and produced the

greatest number of deaths was consumption." And this statement held true until a year or so ago. A few years ago Dr. John H. Pryor said, "We must care for the consumptive in the right place, in the right way, and at the right time until he is cured; instead of, as now, in the wrong place, at the wrong time, in the wrong way until he is dead." These statements can no longer be made with entire truth and justice. No disease has responded more favorably to the meagre sanitary and preventive measures that have been partially and half-heartedly adopted than has tuberculosis.

United States. The death rate from tuberculosis in the United States in 1890 was 254.4 per 100,000 population; in 1900 201.2; in 1910 it was 160.3—a drop from one-seventh of all deaths in 1890 to one-tenth in 1910. And in 1922 the death rate was 97.0 per 100,000, a drop of 62% in 32 years, and tuberculosis has dropped from first place to third place as a cause of death. When we consider the history of tuberculosis for the past twenty-five hundred years this is a truly remarkable achievement for thirty years.

International Statistics. In contrast to these figures for the United States, Coni quotes some interesting international statistics in the *Journal of the American Medical Association,* April 27, 1918, which show the appalling results from tuberculosis in countries where little is done to prevent it. His

table shows the death rate to be: Spain, 500 per 100,000 population; France, 390; Austria, 270; and Italy 180.

England. In England the death rate from tuberculosis declined 54% between 1850 and 1916, following upon the establishment of dispensaries for the early diagnosis of cases, visiting nurses, notification of cases, establishment of sanatoria, and isolation of advanced cases.

Denmark. Denmark is in many respects a model which it would be well for other countries to follow. She has many excellent sanitary laws, including laws in regard to the control of tuberculous cattle. Her health authorities can inspect and condemn (when desirable) dwellings, slaughter houses, plans of construction, equipment, cleaning of school buildings, milk and meat supplies, etc. Disinfection of the house after the death of a tuberculous patient, the removal of a patient from his house, or the removal of children from their homes when they are exposed by careless parents, are within the discretion of the Department of Health. Notification of cases is compulsory. Spitting in public places, and overcrowding in factories and workshops are prevented by law. Educational matter on the dangers of infection and the means of prevention is widely distributed.

Cure. One hundred years ago Laennec, the great French clinician, said, "The cure of consump-

tion may be possible for nature, but it is not so for medicine." No doubt he was impelled to say this after reflecting on the measures then in vogue, which included purgatives, emetics, blisters, bleeding, and the inhalation of various gases, including the air of cow stables. Unfortunately many credulous souls still waste much time and money on medicines foisted upon the public by unscrupulous proprietors.

It is unanimously agreed that the most important factor in the cure of tuberculosis is adequate rest. Next in importance comes careful supervision by a competent doctor. Competent, in this case, includes not only knowledge and experience, but a personality that is able to make the patient cooperate. Indeed, this might be put ahead of number one, or at least might be considered as an essential preliminary, for adequate rest is not likely to be obtained without competent supervision. Diet, exercise, fresh air, climate, morale, tuberculin, and other special measures are important aids. Time is a factor that must not be overlooked or curtailed. Healing is a slow process, and we must make provision for an extended and variable period of "taking the cure."

There is no longer any reason for a fatalistic attitude toward tuberculosis. It is readily curable when taken in a reasonably early stage. It requires repeated exposure for the infection to gain

headway, and the disease develops slowly, as a rule, offering chances for arrestment if we would only take advantage of them early and persevere until a thorough arrestment is obtained. Advanced cases are by no means hopeless. While there is a tendency for the disease to be progressive after it has reached an advanced stage, still many arrests are obtained in such cases, and not infrequently in seemingly hopeless cases. The chances of cure are proportional to early treatment, and the earlier the treatment the better are the results, not only as regards the chances of securing an arrestment, but also as to the permanency of the results.

The "cure" in tuberculosis is not as complete as in pneumonia, for instance. Tubercle bacilli remain within the scar tissue which is formed around the foci of infection, and it must be remembered that relapse is always possible, even after many years. "Cure, then, is possible, and to maintain it requires not an invalid's life always scared of a relapse, but a constant remembrance of the facts learned and a denial of certain indulgences, both of pleasure and of work, which have been found to be unsafe for the recovered consumptive." *

The National Tuberculosis Association was formed in 1904, and among the several hundred present on this occasion more than one-third were "ex-t.b.'s"—robust proofs of the curability of tuberculosis.

* Pamphlet 106, National Tuberculosis Association.

VIII

CLIMATE AND ALTITUDE

"As soon as man finds himself spitting and hacking on arising in the morning, he should immediately take possession of a cow and go up into the mountains and live on the fruit of the cow."

—CELSUS (B.C. 25-A.D. 50).

Not Essential. It is, perhaps, well to say at the beginning of this chapter that climate and altitude are not essentials in the treatment of tuberculosis, but that they increase the chance of recovery is generally accepted by the best authorities on the subject today.

Belief. A belief in the beneficial effects of climate and altitude upon tuberculosis has existed from the earliest times in which descriptions of the disease unmistakably fit tuberculosis. Erroneous beliefs and mistakes in practice have crept into medicine from time to time, but none have survived the test of twenty centuries or more. It would seem then that this belief in climate must rest on firm foundations.

Exaggerated Importance. A few years ago cli-

mate was given first place in the treatment of tuberculosis. This idea became firmly established in the minds of the people. They went West, or were sent West, in all conditions and under all circumstances, and some of them regained their health a larger percentage probably than would have done so had they remained in their old environment. But many did not, and it was unquestionably bad advice, and a fatal mistake for many of them to come in the condition and under the circumstances in which they came. Such indiscriminate advice, fortunately, is rarely given by doctors today; but one still meets patients in the Southwest who were advised to "go West and rough it." This advice is always wrong in tuberculosis, and means failure in many cases that could have been saved at home under proper management and treatment.

Reaction. With the advent of sanatorium treatment and the marked improvement in the results obtained, not only in the good climates, but also in the bad ones, some physicians began to question the value of climate, and to assert that it was of no importance at all. On the other hand, some of the champions of climate (a few of the pseudo-specialists in the Southwest with more enthusiasm than information), began to seize upon each physiological change produced by altitude and to point to it as "the factor" which produced the favorable results, and to say that "clinical experience" had

proved it. As the value of "clinical experience" depends on the training and intelligence of the one "experiencing it" much of this experience was naturally erroneous and worthless, and so these poor advocates of a good cause did more harm than good for the cause. Dr. Alexius M. Forster* has suggested that if Bernard Shaw had chosen this subject for the plot of "The Doctor's Dilemma" he could have produced a much more amusing satire.

Scientific Basis. One may ask then is this belief in climate and altitude purely empirical, or is there also a scientific basis for it? Undoubtedly this basis has been established. It is beyond the scope of this little book to enter a discussion of the relative merits and demerits of the changes produced by altitude upon the lungs, the conformation of the chest, the heart, the blood, and metabolism—suffice it to say that it is a well-established law of nature that when the body processes are called upon to meet an increased demand, they respond with an over-production; and it is this over-production that brings about the benefit in suitable cases that are able to react sufficiently to the stimulating influence of high altitude. Patients with an acute active process with much softening and breaking down of tissue, organic heart lesions, arteriosclerosis, kidney trouble, emphysema, diabetes, toxic myocarditis,

*Transactions, National Tuberculosis Association Meeting, 1911, p. 212.

and vasomotor weakness should not go to high altitudes.

The important factors in high altitudes (over 4,000 feet) are the great amount of sunshine, low humidity, coolness, and pure atmosphere, with a marked stimulating effect on the organism, and increased appetite and activity of the metabolic processes. Lower altitudes (under 3,000 feet) are warmer, less stimulating, more humid, put less strain on the organism, and are more sedative in effects. Such altitudes are suitable for the class of patients mentioned above who should avoid altitudes over 2,500 to 3,000 feet.

When a change of environment is under consideration it is very important, therefore, to select the climate and altitude best suited for each individual case in accordance with the condition of the lungs and the general condition of the patient.

Statistics. Dr. E. S. Bullock * made a careful study of statistics based on three sanatoria in the Southwest at an altitude of approximately 6,000 feet and representing about three thousand patients, and of four sanatoria in the East with the same number of patients. Only those patients who obtained an arrestment of the disease were considered in these statistics. He found that the patients treated in the Southwest had better chances for ter chances.

* Journal Am. Med. Assoc., June 19, 1909.

obtaining an arrestment of the disease as follows: (a) Incipient class, 9% better; (b) Moderately advanced, 17% better; (c) Far advanced, 6% bet-

Essentials. It is agreed that the proper management and supervision of a patient is vastly more important than climate. Hence a patient should not leave his home in search of a better climate unless finances and temperament and family ties warrant it. Professor McSwain, formerly a professor at my Alma Mater, and a most intelligent and close observer, after many years of experience in various climates in "chasing the cure," sums up the situation in this incisive statement: "If a change of climate is to be decided upon, there are more important things not to be overlooked. It is not fair to the big-hearted people of the West, it is not fair to the sick man to send him here without means expecting him to make his own living and get well. This usually means that he will die a burden on the charity of strangers, his death hastened by hardship and privation. Climate is something, but rest, fresh air, good food, and freedom from care must be added if climate is to do its perfect work."

Finances and House-Keeping Cottages. The minimum cost of obtaining sanatorium treatment in a good institution in the Southwest is about one hundred dollars a month. The cost of obtaining adequate medical supervision and the proper hous-

ing and food outside of a sanatorium would average more than this. Some of the sanatoria are now providing house-keeping cottages for their patients. This offers a more economical plan for a relatively large class of patients and helps to solve the problems of temperament, nostalgia, and food.

A Good Climate. The elements which make up a good climate and which should be considered in selecting a climate are: (a) sunshine, (b) temperature, (c) humidity, (d) wind, (e) pure atmosphere. A maximum amount of sunshine is desirable. It sterilizes the atmosphere, has a favorable influence upon the physical feelings and mental attitude of the patient, and has some therapeutic value, especially in tuberculosis of the skin, joints, and bones. Extremes in temperature are undesirable. A wide variation (20 to 40 degrees) in the daily temperature has a favorable and stimulating effect. Cold dry air is a good tonic. Low humidity is favorable —here again extremes are not desirable. Damp, cold winds, and hot, dusty ones are to be avoided. A dry cold wind, if not continued long enough to "get on the nerves," is not harmful. An atmosphere free from dust, smoke, fogs, and gaseous and bacterial contamination is desirable. Altitudes of from four to six thousand feet possess climates which combine more of these good qualities than are to be found in climates of lower altitudes.

The mere "change of climate," scene, and con-

ditions, as a rule, has a favorable physiological effect on the patient, and the psychological effect is more pronounced and important. Every one is familiar with the effect of good weather on the mental attitude and the difference of feeling, ranging from depressing languor to exhilirating energy and optimism, with a change from bad to good weather. Dr. King* says in "The Battle With Tuberculosis," "Ask yourself the following questions: 'On which days am I more likely to follow the out-of-doors treatment—clear days or rainy days, calm days or stormy days?' 'On which days are my spirits the more buoyant—sunshiny days or cloudy and wet days?' 'On which days do I have the better appetite—when the perspiration trickles down my face or when I can appreciate a light wrap?' 'On which days do I most feel the joy of living—when the smoke turns a somersault over the side of the chimney, or when it rises like a fluffy pillar straight up into the blue of heaven?'—more sunshine and less cloud and rain, more calm and less storm, greater dryness and less humidity, and an equable barometric pressure offer obvious climatic advantages."

It is a significant fact that all of the workers in tuberculosis who are located in good climates are impressed with the value of climate. And it is fair

*King, D. McDougall, The Battle with Tuberculosis and How to Win It. J. B. Lippincott Co.

to say, I am sure, that a large majority of those located in bad climates admit the possibility of favorable influences in good climates.

Advice on Climate. To sum up the best advice on climate and altitude, I would repeat that they are not essentials in the treatment of tuberculosis. It is agreed that the proper management and supervision of a patient is vastly more important than climate. However, if one can avail himself of its favorable influence without too great a sacrifice of finances and too great a disturbance of his mental equilibrium consequent upon the separation from his family, friends, etc., and can be assured that he will be as carefully looked after in the new environment as in the old, it is certainly advisable for him to make the change.

I agree heartily with Dr. Francine when he says, "Without attempting to dogmatize upon the question of climate, one important fact stands out, *i. e.*, the sooner the general practitioner or internist ceases to advise change of climate promiscuously, the better it will be for consumptives in general and for those of small means in particular. Too often the physician out of thoughtlessness or from habit, and with self-complacent irresponsibility, advises a change of climate to those who can ill afford it, or who are not really proper cases from a medical point of view to send away. . . . Such advice cannot be too strongly condemned, both from a pro-

fessional and humanitarian standpoint. But the fact remains, I believe, that the change of climate in suitable cases . . . is of distinct advantage, provided always that the patient's financial resources are amply adequate."

I quote in conclusion the late Dr. Trudeau's * opinion: "My experience for the past twenty-five years has in no way altered my opinions as to the beneficial influence of climate in the treatment of pulmonary tuberculosis. . . . It is true that good results may be obtained without change of climate, but where a change of climate can be added to the other well-known factors which make up a favorable environment for the patient, better results can undoubtedly be obtained, and a judicious change from one climate to another will often turn the tide in a case which has ceased to improve and carry it to a successful issue."

* Transactions National Tuberculosis Association Meeting, 1911, p. 217

IX

HELPFUL SUGGESTIONS

" . . . forsan et haec olim meminisse iuvabit."

—VERGIL.

(*"Sometime, perhaps, it will be pleasing to remember these things."*)

Tuberculosis is a curable disease, and the largest part of the job lies with the patient. Close attention to detail and full co-operation are essential. Violation of these principles brings its own punishment by retarding your improvement and seriously jeopardizing your chances of recovery. A gloomy, worrying, fault-finding disposition is a big handicap in the fight. An optimistic, cheerful mood will aid greatly and hasten a favorable outcome.

Some patients are prone to worry over trivial symptoms and things which could easily be explained by the doctor if he only knew of them. You should feel perfectly free to tell your troubles and symptoms to the doctor.

Paper Bags and Napkins. Pin some paper napkins, cut into quarter size squares, on your bed

to use in covering your mouth and nose when you cough, etc. Also pin a paper bag on the bed to receive these squares after they have been used, and to receive toothpicks and other things that come in contact with your mouth.

Dry Heat. The most convenient and effective way of applying dry heat is simply to use your electric light. Get a tin shade long enough to come below the tip of the light bulb and put it on the light, and then place it over the spot you wish to treat. Put a layer of blanket around the shade in order to hold in the heat, and turn on the light. You will have constant heat as hot as you can stand it simply by turning on and off the light. I found this the most effective way to relieve pleurisy, excepting codeine or morphine, which one does not want to use on all occasions. It is much more agreeable than a mustard plaster and leaves no blister behind. It is a thousand times more efficient than antiphlogistine, much easier to apply, and more agreeable for the patient, and costs about one-thousandth as much. (*Note*—The American Medical Association after examining antiphlogistine reported that it was entirely inert.)

Appetite. Contrary to common belief a raw egg can often be taken without causing nausea when even the sight or smell of a cooked one produces it. I am not an advocate of raw eggs, except in the above circumstances, as it has been shown that

cooked eggs are twenty to thirty per cent more digestible than raw ones.

A little cold egg-bread, or cracker, crumbled in your sweet milk may enable you to take it when it seems impossible to take the plain milk.

I found Ovaltine (for sale at most drug stores), a powdered form of malted barley, milk and eggs, a palatable and nourishing drink when most other things seemed impossible.

Cough. Much unnecessary coughing is done by patients who do not realize that it is strenuous exercise and may cause much harm. A certain amount of coughing is unavoidable in patients who raise much sputum, but it is surprising how much control over your cough a determined will-power can have. For instance, in pleurisy one's cough is reduced to a mere aspirating grunt, if the pain is severe.

It is very desirable to control your cough without drugs, for any drug that is efficient will upset your appetite and digestion when taken regularly every day. Hot water, or almost any hot drink, sipped along as necessary, is the best and simplest remedy. It may be necessary to stop talking and laughing, or to lie down, or even go to bed for a few days in order to subdue a persistent cough. If these measures fail, consult your doctor about drugs.

If you are troubled after eating by coughing until you vomit your meal, or part of it, the fol-

lowing will help you: Before meals drink a cup of hot water, change your position and try to clear your bronchi and cavities of all sputum which may have accumulated there. Take little liquid with your meal and rest in reclining position one-half to an hour after the meal. It is very important to retain what you eat.

If you are troubled with severe coughing spells on sitting up in bed in the morning, you can secure much relief by getting up by degrees. First, drink a cup of hot water, then raise up to about thirty degrees. At this stage you will cough a little; then wash face and hands, and then raise up a notch higher and eat breakfast. Rest a while after breakfast and then sit up to any position you like. In this way you can avoid the exhausting cough which comes on if you sit up straight all at once.

Fullness and Shortness of Breath on Eating. If you feel uncomfortably full and short of breath on eating, or immediately after, the following procedure will probably relieve you: Take four small meals a day, and very little liquid with your meal; five drops tincture nux vomica before meals (ask your doctor about this); confine your food to cereals (with little milk), bread and butter, fresh vegetables (except greens), eggs, little meat, honey, and stewed fruits.

Substitute for Bed-Pan. If you find the bed-

pan uncomfortable and difficult, the following substitute will probably be quite satisfactory: Put a chair that is several inches lower than the bed up against the bed, spread out several layers of newspaper from edge of bed to chair, turn on your side and allow buttox to extend well over edge of bed, flex your knees up toward chest so as to imitate sitting posture, and you will find results very satisfactory. Use ordinary urinal at same time.

Bowels. It is of great importance to keep the bowels well regulated—one or two normal movements a day being maintained. The patient should not rely on drugs for this purpose, but should accomplish this with a well-balanced diet, taking enough green vegetables, such as spinach and cabbage, stewed prunes, honey, bran-bread, and fresh fruits to accomplish this end. Mineral oil, night and morning, may be used to supplement this regimen if necessary. It is purely a lubricant and is not digested or absorbed. An occasional mild laxative, such as cascara, may be necessary; and castor oil, when occasion demands, has a wholesome effect.

It is a great help and highly important to have a regular time for this purpose, preferably just after breakfast each morning. The habit can be established usually within a week or two. The patient should go to stool at the same time each morning and sit for 15 or 20 minutes, and if there is no

movement he should then use a suppository or enema for a few times until the habit is established.

Water. The patient should have a pitcher of fresh water by his bed all the time and drink freely —six or eight glasses a day, unless he has a heart or kidney complication which would contraindicate this. About an hour after meals and before retiring are the best times for drinking. A large amount of water tends to dilute the poisons of the disease and to wash them out of the system, as well as being a great help to the bowels.

Mouth. "Mine own mouth shall condemn me," and yet the mouth is often the most neglected part of our anatomy. A foul mouth, pyorrhea, and decayed teeth not only have a very bad influence on the appetite and digestion, but may be the source of very serious infection in the heart or kidneys, and in "rheumatism." We should give careful attention daily to cleansing the teeth, brushing them after each meal, and using a good toothpaste once a day, preferably at night. The mouth harbors many bacteria, and often pathogenic ones. If the gums or teeth are in poor condition, it is well to use a potassium chlorate mouth wash several times a day, and to gargle with Dobell's solution morning and night, in addition to the care of the teeth as mentioned above.

Sleep. Some patients are inclined to worry un-

duly because they cannot sleep as much as they think they should—and the more they worry the less they sleep. If they would only leave off the worry, they would get all the rest they require, whether they sleep or not, for it is possible to rest without sleep if they lie in a perfectly relaxed condition physically and mentally. And, incidentally, such a relaxed attitude is the best soporific of which we know. Stop worrying a while and try and see if it doesn't work!

Amusements Amusements are often the cause of set-backs in tuberculosis—probably more often than work. The patient must realize that amusements, as well as work, count on his allotted exercise, and that when he has used up this amount in either work or play he cannot then go and indulge in the other with impunity. Pool and billiards are bad forms of exercise for the consumptive; and in addition to this the atmosphere of the room is often vitiated by smoke, dust, and poor ventilation. Games of chance, however small the stake, are too seductive and exciting for the "t. b.," and they, together with pool and billiards, should be postponed for at least two years after the "cure." A rubber of bridge, whist, solitaire, "42," etc., are not objectionable, if not overdone. Chess is too concentrating —I have seen temperature raised two degrees by a game of chess. It is much better to cultivate an outdoor hobby—an interest in plants, birds, land-

scape gardening, architecture, astronomy, etc., and such diversions will prove to be far more interesting and satisfying than those mentioned above.

Food. (See Appendix for table of food values and vitamins.) Wherever a number of people are gathered together in a boarding house, it is customary and popular to complain of the food. This habit is especially contagious among the sick. The situation is further complicated by the fact that the demands on metabolism are increased, while at the same time the appetite and digestion are very apt to be upset by the toxines of the disease. It behooves the cook, therefore, to make the food as tempting as possible, and the patient to do his best to eat it, and to imitate the ox and ass in the following lines:

"Does the ass bray when he hath grass?
Or loweth the ox over his fodder?"

Food is a most important factor in tuberculosis. It should be varied and savoury, but the use of strong condiments for this purpose is harmful. Milk, meat, eggs, bacon, butter, ripe olives, nuts, potatoes, peas, beans, spinach, cabbage, lettuce, tomatoes, honey, prunes, peaches, apricots, and fresh fruits, such as apples, bananas, grapes, and oranges make a good list to select from. Milk, meat, and eggs are the mainstays, and prunes and honey are excellent adjuvants both on account of their high food value and laxative qualities. Spinach and

cabbage are good fillers and aid the movement of the bowels by adding bulk to the intestinal contents.

When repugnance to food is marked, a liquid diet may be necessary. The following sample menu should be approved or modified by your doctor:

BREAKFAST (About 700 calories)

One cup Ovaltine (8 ounces), contains malted barley, eggs, and milk.

One glass milk (8 ounces), may use on cereal or crumble crackers or egg-bread in it.

One egg (raw if necessary).

One piece buttered toast.

DINNER (About 700 calories)

Thick soup (8 ounces), pea, tomato, potato, etc.

Scraped beef, or beef juice (2 ounces).

Prune souffle, or apple sauce, with or without cream.

One glass milk or buttermilk.

One egg.

SUPPER (About 850 calories)

Gruel (4 ounces) with butter or milk, or chicken broth and crackers.

Junket (4 ounces).

One cup Ovaltine.

Malted milk flip (*see below*).

LUNCH (4 p. m. or bedtime, about 230 calories)

One cup Ovaltine, or glass of milk and one egg.

A malted milk egg flip is very nourishing and may be taken once a day or every other day. It is prepared as follows: One egg, four ounces milk, two teaspoonfuls malted milk, vanilla flavoring, shake well, and then add large tablespoonful chocolate ice cream. If you have no shaker the egg may be whipped separately, the malted milk dissolved, and then mixed as above.

A piece or two of candy may be taken just after meals, but not between meals.

Proteins, Carbohydrates, and Fats. Foodstuffs are divided into three main classes, namely, proteins, carbohydrates, and fats. We get our supply of proteins chiefly from meat, milk, eggs, beans, and peas; carbohydrates from sugar, bread, potatoes, fruits, cereals, and milk; fats from bacon, butter, cream, oils, and nuts. Certain minerals are also necessary, chief of which are sodium, which we get in common table salt, and calcium and iron, which are found in meat, milk, eggs, and vegetables. Proteins are needed chiefly for the repair and growth of our tissue cells; carbohydrates and fats chiefly to furnish the fuel necessary for our energy. In recent years it has also been discovered that certain constituents of our food, known as vitamins, are essential to health.

The Calory. The unit for the measure of food values is called the calory, which is the amount of heat required to raise one liter of water (about one

quart) from 0 degrees C. to 1 degree C., or from 32 to 33.8 degrees F.

1 gram* of protein = 4 calories, approximately.

1 gram of carbohydrates = 4 calories, approximately.

1 gram of fat = 9 calories, approximately.

One should try to maintain about the normal weight for his age and height. (See Appendix for table of weights.) A few pounds under or over this is of no consequence; but marked under- or overweight (15 or 20 pounds) should be avoided when possible. The stuffing methods of a few years ago are unscientific and have wisely been abandoned. A marked gain in weight is not at all necessary for improvement, and by no means does it always indicate improvement in tuberculosis.

One should take an amount equal to 2,500 to 3,500 calories a day, divided about as follows: Protein, 500 or 600 calories (125 to 150 grams†); carbohydrate, 1,500 to 1,800 calories (375 to 450 grams); fat, 900 to 1,200 calories (100 to 125 grams); or roughly the equivalent of one-half pound meat, six glasses milk, two eggs, quarter pound potatoes, six slices bread, two saucers prunes, and three squares of butter a day. The tendency in tuberculosis is to eat too little, and one should

* 30 grams = 1 oz., approximately.
† lb. = 460 grams, approximately.
1 oz. = 30 grams, approximately.

see to it that one gets enough nourishing food to maintain one's weight. But remember that over-eating is as great an evil as under-eating. If you give an automobile too much gas you choke the engine. Dr. Brown well says, "To eat as little as will enable you to hold your weight and strength is the important thing."

X

MISCELLANEOUS

"Success lies not in achieving what you aim at, but in aiming at what you ought to achieve."

The Daily Routine. The following routine has been found to give the best results and this, or something similar, is in force in most sanatoria:

7:30 Awake. Take temperature. Glass of hot water, or hot milk if desired. Warm water for washing. Cold sponge if ordered.

8:00 Breakfast.

8:30 Evacuation of bowels.

8:45 Outdoors on chair, or in bed on porch.

10:00 Exercise when ordered.

10:30 Extra nourishment when ordered.

12:30 Rest, reclining on chair or in bed. Temperature.

1:00 Dinner.

2:00-4:00 Silent rest hour, lying flat in bed or on chair.

3:30 Extra nourishment when ordered.

4:00 Temperature. Exercises when ordered.

5:30 Rest, reclining on chair or in bed.

6:00 Supper.
6:30 Outside.
8:00 Temperature.
9:00 Extra nourishment when ordered.
9:30 Bed.

Once or twice a week hot bath followed by cold sponge.

Temperature. The temperature and pulse are the most convenient guides for the patient. Though by no means infallible indices of what is happening in the lung, still for practical purposes they are fairly safe advisers. It should be understood that their warnings come after some mischief has been started, but usually in time to prevent serious damage if they are heeded.

Normal Temperature. The normal temperature is usually given as 98.6, but this does not take into account the daily variation between morning and evening temperatures which is usually a degree to a degree and a half. In my experience the average morning temperature for afebrile patients is between 97.2 and 98, and the afternoon temperature between 97.8 and 98.6. Variations above and below these figures may, and do, occur in normal healthy individuals.

How Temperature Is Regulated. The temperature of the body is kept constant by the circulation of the blood which is controlled by a center in the

brain. In tuberculosis this brain-center is hypersensitive, or more easily irritated than in health, and hence does not regulate the body temperature as easily as in health. It is on this account that such things as good or bad news, games of chance, constipation or diarrhea, a slight cold, etc., may cause a sharp rise in temperature, which may worry the patient, but should not fool the doctor, as the curve of such temperatures differs from that caused by tuberculosis.

When to Take It. The temperature should be taken immediately on awakening in the morning before the mental and physical activities of the day are begun, in order to get the lowest point. A temperature of 98.6 at this time usually means as much fever as 99.4 in the afternoon does. It should be taken again at 12, 4, and 8. If you have been free from fever for some time it is not necessary to keep on taking your temperature every day. Once a week at 8, 12, 4, and 8 will do.

How to Take It. After exercise the patient should rest for half an hour before taking temperature or pulse. Do not take either cold or hot drinks shortly before taking the temperature, and do not take the thermometer out at frequent intervals to see what the mercury is doing. Keep thermometer under tongue for five minutes regardless of whether it be a one- or two-minute one. In cold weather, especially if wind is blowing and you have been

talking, keep mouth shut for fifteen minutes before taking temperature. Also, warm the thermometer on top of tongue before placing it under the tongue. In very cold weather, up North and East, mouth temperatures are not very reliable and the temperature should be taken per rectum. It should be remembered that rectal temperatures are normally 0.6 to 1 degree higher than mouth temperatures.

Something or Nothing? Before leaving the subject of temperature I should like to call attention to a very common mistake that most patients and many doctors make when they say, "I have a temperature," or "no temperature" when they mean "fever" or "no fever." Everybody and everything has a temperature, the atmosphere has a temperature, and hence it is incorrect to say "I have no temperature," and axiomatic to say "I have a temperature." In the words of Socrates, "Do I seem to say something, or nothing at all?"

Pulse. The pulse is a more sensitive indicator than the temperature, but also a more unreliable one, as it is more easily affected by other factors besides the disease. If you could take your pulse while asleep it would not tell any stories, but even the mere act of counting it often increases the rate, especially in nervous patients.

An instance. I recall how it defeated me on one occasion when attempting to cheat on my

friend, Bill L. Bill had a new stop watch and had collected a dime from most of his friends by betting them that they could not guess within ten seconds of a minute. When he made his proposition to me I thought how easy it would be just to count my pulse and collect his dime. But, alas, the excitement of this trick increased my pulse rate, and Bill increased his wealth. Don't bank on your pulse too much!

Normal Pulse. The pulse varies with age and with the individual. A fair average for normal is between 70 and 80. Women have a faster pulse than men. The smaller the animal the faster the pulse. The elephant's pulse is 26 and the mouse's 250 per minute.

Rest. Rest is recognized now as the most important factor in the treatment of tuberculosis. Prolonged rest in bed is the quickest and surest road to the arrestment of the disease. It is the best measure to combat the toxemia and the fever which is caused by it, the cough, the disturbances of digestion, and the increased demands on metabolism; and it allows the healing process in the lungs to take place more quickly and with less disturbance and danger of back-sets.

The popular notion that rest in bed will cause the patient to lose his appetite and weight and bring on constipation is an erroneous one. These things are caused by the toxines of the disease and

by the fever, and not by the rest. When fever is present and the toxines of the disease are being washed out into the blood, the demands on metabolism are greatly increased, while at the same time the digestive organs are upset and their efficiency lowered. All of which means more work for the heart and lungs, and under increased difficulties. Exercise in the face of these conditions is simply adding fuel to the fire.

The amount of extra work thrown upon the heart and lungs by the simple exertion of sitting up, and still more in standing up, is astonishing. The unit of measure of this work is called the foot-pound, i. e., the energy required to raise one pound one foot. The normal heart does about two and a half foot-pounds of work at each beat. The mere act of standing up will increase the patient's pulse usually ten beats or more per minute, or 600 beats per hour, which equals 1,500 foot-pounds of extra work, or about the equivalent of bringing in an armful of wood, a thing which the patient very wisely would not think of doing.

Exercise. After an adequate period of rest, which will vary with the individual case and the stage of the disease, there comes a time in the course of treatment when regulated exercise gradually and systematically taken is beneficial. Exercise is "dangerous medicine" in tuberculosis, and the patient should no more take upon himself the

responsibility of determining the time and amount of his exercise than he should of administering tuberculin to himself. One's feelings are a deceptive and dangerous guide on this point, as the damage from too much exercise may not become apparent to the patient until days, or even weeks, after it has been done.

For those patients on exercise the following rules are very important:

Exercise means walking. Special permission must be obtained for any other form of exercise.

(1) Never get tired. Always stop at the first symptoms of fatigue, physical or mental.

(2) None if you are uncomfortably short of breath, or if your pulse is fast. Ask the doctor if pulse is over 90.

(3) None if your afternoon temperature the day before was over 99.4, or if your morning temperature that day was over 98.6.

(4) None if there is any trace of blood in your sputum.

(5) None for one hour after meals.

(6) No hill or mountain climbing without special permission.

(7) If you are caught out in the rain, don't hurry; never run on any account. It won't hurt you to get wet if you keep on walking and change your clothes immediately when you get home, first

drying yourself carefully with a towel or taking an alcohol rub.

(8) Exercise regularly and systematically, rain or shine.

Tuberculin. Tuberculin is a two-edged sword which should be used only by a careful, experienced physician who is fully cognizant of its dangers and of its action, and who has a definite and intelligent conception of what he is trying to accomplish with it. The patient should be under the most careful observation during such treatment and an accurate record of his pulse, temperature, expectoration, appetite, and weight kept; also the focal reaction in the lung should be carefully observed. Only in this way can the patient be adequately safeguarded against the dangers of tuberculin. In some cases it undoubtedly causes marked benefit—chiefly in chronic cases that are at a standstill, and in early cases where the defensive mechanism of the body is capable of being stimulated to put forth a greater degree of resistance. It is also claimed by some authorities that the degree of immunity in children can be increased by tuberculin treatment.

The possibility of beneficial results from tuberculin are based on: (1) The inflammatory reaction which it produces around the tuberculous foci. If the right degree of inflammation is produced, it promotes the healing of the foci; too much inflammation causes harm; and too little has no ef-

fect. (2) The possibility of increasing one's resistance by stimulating cells which are capable of a greater response than they are giving to the stimulation which comes from the disease. (3) The possibility of increasing one's tolerance to the toxines of the disease.

If a physician is not prepared or willing to keep the accurate record mentioned above, and to observe carefully the focal reactions, he should not give tuberculin; nor should the patient take it from one who does not observe these precautions.

Artificial Pneumothorax. Artificial pneumothorax consists in injecting air, or gas, into the pleural cavity in order to collapse the lung. This brings about: (1) more or less complete rest of the lung, and allows the healing process to go on uninterrupted by its normal movements; (2) a marked slowing of the blood and lymph flow in the lung, with a diminished absorption of the toxic products of the disease; (3) a tendency to check the spread of the disease, and to prevent the aspiration of infectious material into the other lung. The effect on the temperature, amount of sputum, cough, and appetite is often very prompt and striking. This form of treatment sometimes brings about the arrestment of the disease in otherwise quite hopeless cases.

The inherent dangers of the treatment are very small, if careful technique is observed. The ob-

literation of the pleural cavity by the adhesion of the two pleurae, which frequently follows after the cessation of treatment, is an objectionable feature, and renders it impossible to use this form of treatment later on if it should become desirable to do so. It is better, therefore, to bring about the arrestment of the disease without a pneumothorax if possible, and reserve this measure for future emergencies. If, however, after several months of careful treatment the disease is steadily progressive, an artificial pneumothorax should be seriously considered and instituted, unless there are complications of the heart or of the other lung which forbid it.

Medicines. Up to the present time no medicine has been found that has anything more than an indirect effect in the treatment of tuberculosis, for the most part through allaying troublesome symptoms. The patient should not take any medicine unless it is prescribed by his physician, and any medicine that disturbs the appetite and digestion should be discontinued.

Alcohol. I take the following facts from "Alcohol: Its Action on the Human Organism," a recent Government Report by the committee of the Liquor Control Board of England. On the committee were Professor Cushny, a world-renowned authority on pharmacology (or the action of drugs); Professor Sherington, a well-known authority on physiology; and Professor McDougall,

of the Department of Psychology of Oxford University. There were other men, distinguished in business and politics, on the committee, but these three names guarantee the scientific and dispassionate nature of the report.

"There is no evidence of injurious action of moderate doses, well diluted, and taken at intervals long enough to eliminate the effects of the previous one; but bad effects follow when it is not so taken. It is devoid of any beneficial effects in any form whatever, except as a narcotic in certain abnormal states, as excessive fatigue from loss of appetite or inability to sleep.

"There is no mutual exclusion between the properties of a food and a drug (or poison)—alcohol is both. As a food it is oxidized completely, furnishing heat and energy for muscular work, but it cannot be stored as fats and carbohydrates are. On account of its drug action it can be used as a food only in a restricted sense—it is not a true food stuff. It has no accessory action on metabolism.

"Its chief action is on the nervous system. Even moderate doses involve some impairment of the higher nervous functions. It is purely a narcotic and not a stimulant—the feeling of well being is due to a blunting of the higher faculties, and general loss of control. Small doses have no appreciable effect on digestion or on the heart—larger

doses depress or paralyze them. The feeling of warmth is due to dilatation of the skin blood-vessels, but the actual result is a more rapid loss of heat."

In the light of these facts one must admit that it is much the safest policy to abstain entirely; since, (a) no possible good can come from it; (b) it is a potent factor for harm if abused, and its influence in this direction is subtle and hard to resist.

Tobacco. The effect of tobacco on the appetite and digestion, and on the heart and blood-vessels is unquestionably harmful. The importance of these effects, however slight, is magnified in tuberculosis when so much depends on the proper performance of these functions. The toxines of tuberculosis affect the heart, and the nicotine of tobacco is simply adding fuel to the fire. The sedative effect of tobacco is relatively slight as compared with that of morphin and alcohol, and the habit can be comparatively easily broken by the exercise of a little will-power, and it is advisable for the consumptive to do this. In able-bodied men smoking is associated with a loss of lung capacity of about ten per cent.

PART II

REFLECTIONS OF A DOCTOR-PATIENT

I

HISTORICAL

"The more attention you give to the tuberculosis problem the more it grows in size."
—TRUDEAU.

1600 B. C. Recent investigations by paleopathologists on Egyptian mummies indicate that tuberculosis was a flourishing disease as early as 1600 B. C. They advanced the interesting hypothesis that the Egyptians recognized the favorable influence of climatic resorts on this disease, basing this opinion on the fact that larger numbers of mummies showing tuberculous changes are found in certain localities with good climates than in other places, and assuming that these patients went to these places for the benefit of the climate.

Hippocrates. The first accurate description of the signs and symptoms of tuberculosis recorded is by Hippocrates (460-377 B. C.), known as the "Father of Medicine." The belief was held by the Greeks at this time that this disease was contagious. Hippocrates left numerous writings on medical subjects. The following aphorism by him gives an interesting light on his views on medicine:

"Quae medicamenta non sanant, ea ferrum sanat; quae ferrum non sanat, ea ignis sanat; quae vero ignis non sanat, ea insanabilia reputare oportet."

("What medicines do not cure, the knife cures; what the knife does not cure, fire cures; what, in truth, fire does not cure, it is proper to consider these things incurable.")

Barren Period. No advance over Hippocrates' ideas was made for several centuries. Galen (131-201 A. D.) recommended the high lands of Phrygia and a milk diet. Pliny's (23-79 A. D.) enthusiasm over the pine forests has a modern echo in the sanatoria located in the pine forests of North Carolina. Following this period there was a long barren age of about fourteen centuries during which no advance is recorded. In the seventeenth century Sylvius and Morton noted the connection of tuberculous nodules with tuberculosis. They also believed that it was hereditary and contagious.

Progress in Nineteenth Century. Bayle (1810) was the founder of the modern pathology of tuberculosis. He described accurately the stages of development, and recognized the miliary tubercle as the starting point.

Laennec (1819), a Frenchman, recognized the tuberculous nature of scrofula, and gave an accurate description of the transformation of tubercles toward ulceration. His greatest gift to medicine,

though, was the "art of auscultation" (the method of listening to the chest with a stethoscope, which is today the most reliable method of obtaining information of what is happening in the chest). He was the first to recognize pneumothorax in a living patient, and he described accurately its physical signs. He was one of the great masters of medicine, although he was taken off by an early death from tuberculosis.

In 1840 Dr. Bodington, an obscure practitioner living in Sutton Coldfield, England, published an essay on "The Cure of Pulmonary Consumption on Principles Natural, Rational, and Successful" in which he emphasized especially fresh air day and night, generous diet, and careful medical supervision. He stated that cold air is never too intensive for a consumptive, and that his apartment should be kept well aired. His views received very bitter and contemptuous opposition. He was regarded as a lunatic; his patients were driven from him, and by the irony of fate, he was compelled to turn his institution into an insane asylum.

Virchow (1847-50), a German, added valuable data on microscopic studies.

Villemin (1865-68), a Frenchman, established the transmissible and infectious character of the disease by a series of brilliant experiments on animals. He concluded that tuberculosis was trans-

mitted from man to man by a "virus" present in the sputum.

Koch and the Great Campaign for the Prevention and Cure of Tuberculosis. The greatest name in the history of tuberculosis is Robert Koch, a German, who discovered the tubercle bacillus in 1882, grew it on artificial media and stained it, and established the fact that it was the cause of tuberculosis. Dr. Trudeau said: "In 1882 Robert Koch announced to the world his discovery of the tubercle bacillus. His paper (probably the most far-reaching in its importance to the welfare of the human race of any original communication) at once threw a flood of light on the darkest page of medicine, a light which revealed the microscopic fungus which is the cause of tuberculosis, and gave a new impulse and opened a new horizon to medical thought."

From this information and stimulus began the great campaign for the prevention and cure of tuberculosis, with the establishment of dispensaries, sanatoria, national and international conferences, state and city laboratories where any patient can have his sputum examined free of charge, etc. The results of this campaign have been most encouraging indeed. The death rate from tuberculosis (all forms) in the United States Registration Area was 254.4 per 100,000 population in 1890. In 1910 it was 160.3 per 100,000; and in 1922 it was 97.0

per 100,000, and tuberculosis has dropped from first place to third place as a cause of death. (See chapter on Prevention and Cure.) Koch died in 1910, and has been honored by the erection of a statue to him in Berlin.

Cornet established the importance of dust from dried sputum as a source of infection.

Fluegge modified this air-borne view by showing that the moist droplets from cough spray and sneezing were a more important source than the dry dust.

Von Behring called attention to the alimentary tract as a source of infection from infected milk and food, especially in children.

Sanatoria. The sanatorium idea was originated by Brehmer. He established at Goebersdorf, Germany, in 1859, the first sanatorium. He located it in the mountains and laid out attractive paths for his patients to take regular walks—a regimen of graduated exercise after a fashion. His patients undoubtedly got more exercise than they should have, but this regulated open-air regimen produced so much better results than were being obtained otherwise that the plan, in spite of much opposition at first, gradually became popular and highly esteemed. His distinguished patient, Dr. Dettweiler, was impressed with the favorable influence that "rest" had upon the patients under these outdoor conditions and became one of the earliest

advocates of rest in the treatment of tuberculosis, which is recognized today as the most important factor in its treatment.

Dr. Trudeau. Dr. Trudeau, in our country, was among the first to break away from the "hot-house" treatment (the plan of keeping the patient in a room with all the windows and doors closed, and with a fire going, as he describes the treatment that his brother received in 1865), and to advocate the outdoor life and open-air treatment. This he did by personal example in going to the Adirondacks, where he later established the now famous Adirondack Cottage Sanitarium.* He also proved the advantages of outdoor life by the following interesting experiment. He infected ten rabbits with tuberculosis, five of which he placed in a cellar with damp, sunless atmosphere and poor food, and the other five he placed in a wire pen with access to the open air and sunshine. The results were very striking. The disease progressed very rapidly in the five rabbits in the cellar and four of them died within three months; while four of the five out in the open recovered.

*Now the Trudeau Sanatorium. The Trudeau School of Tuberculosis was established in connection with this sanatorium in 1917. Its purpose is to offer the opportunity to physicians to become more thoroughly acquainted with the best methods of diagnosis and treatment of tuberculosis, and to have a little personal experience in this line—features that have been entirely too much neglected by our medical schools in the past.

Other American Workers. Among other American workers in tuberculosis who deserve mention for their important studies and contributions are: Benjamin Rush, who contributed several papers of importance which were among the first to be published in America; Samuel G. Morton, a pupil of Laennec, published in 1834 a volume on Pulmonary Consumption which was the first issued in the United States; William W. Gerhardt added important studies on tuberculous meningitis; Henry I. Bowditch was interested in tuberculosis throughout his long and active life, and his labors in New England added important contributions to the disease; Austin Flint's contributions to the physical signs and symptoms of tuberculosis was a work of great merit and is still of value.

National Tuberculosis Association. The National Tuberculosis Association was formed in 1904. Its purpose is the study and prevention of tuberculosis. Dr. E. L. Trudeau was the first president, and such distinguished men as the late President Roosevelt and Sir William Osler have been numbered among its honorary vice-presidents. Anyone who is interested in the campaign against tuberculosis is eligible for membership, and the dues are five dollars a year. The address of the Association is 370 Seventh Avenue, New York.

The Association has promoted and stimulated the organized movement against tuberculosis in

every possible way. Some of the notable achievements are:

(1) Organized and conducted the Sixth International Congress of Tuberculosis at Washington in 1908.

(2) Started the first traveling tuberculosis exhibit, and continued it for eight years. This exhibit demonstrated the value of this method of education, and resulted in the creation of thousands of similar exhibits, large and small.

(3) Promoted the Tuberculosis Christmas Seal sale from a limited sale of 30,000,000 in 1910 to over 400,000,000 in 1923.

(4) Printed and distributed educational leaflets, posters, and booklets on tuberculosis aggregating several million copies.

(5) Established the *American Review of Tuberculosis,* the only strictly scientific journal on tuberculosis published in English in America.

(6) Established the Framingham Health and Tuberculosis Demonstration.

(7) Co-operated with the American Medical Association in exposing "fraudulent cures" for tuberculosis.

(8) Rendered valuable aid to the Government in handling the tuberculosis situation during the war.

(9) Organized state and local tuberculosis associations now covering every state and all the

large centers of population in the United States, approximately 1,400 in all.

(10) Expended through these national, state and local associations, $25,000,000 in education and organization, which in turn has resulted in the securing of appropriations from public funds amounting to $150,000,000 for the establishment of tuberculosis agencies with a total annual maintenance budget of over $30,000,000.

(11) Developed the idea of public health nursing from small beginnings to one of the most significant means of disease prevention today known. There are now about 12,000 public health nurses in the United States.

(12) Inaugurated and developed the first and most successful campaign for child health education through the public schools. This Modern Health Crusade has enrolled over 8,000,000 boys and girls.

(13) Promoted health as an individual and community asset throughout the country, resulting in the ever-increasing co-operation of public authorities to assume their rightful share of responsibility.

Tuberculin and Artificial Pneumothorax. In addition to the "rest-hygienic-dietetic-open-air" treatment which has been developed in the last twenty-five or thirty years, two other measures stand out above all other remedies that have been

tried during this time, namely, tuberculin and artificial pneumothorax. Koch discovered tuberculin in 1890 and there have been vigorous controversies as to its therapeutic value since then. The consensus of opinion of those who have studied tuberculin most carefully is that it is of definite value in certain selected cases when administered by one who thoroughly understands its limitations and dangers. As a diagnostic test it is of the greatest importance, both in human beings, and more especially in testing dairy cattle.

Forlanini, an Italian, first suggested the use of artificial pneumothorax in 1882, i. e., the method of injecting air into the pleural cavity in order to collapse the lung and give it absolute rest. He first tried it in 1892, and reported a case successfully treated in 1894. Dr. Murphy, of Chicago, in 1898 independently conceived the idea, and reported five cases so treated. Since that time many thousands of cases have been so treated, and many of them have received striking benefit and recovery.

Tuberculosis—Extent, Races, Animals. Tuberculosis has claimed the greatest total of victims of any disease, although in the last few years it has been reduced from first place to third place as the cause of death, and is still falling and will continue to fall as the methods of prevention become better known and universally adopted, and the earliest possible diagnosis and treatment instituted. It ex-

ists in all latitudes and altitudes and climates, but is most prevalent in temperate zones and lowlands. This is accounted for largely by the fact that the population is more dense in these regions, and consequently the environment more insanitary. All races are subject to it. The Indians, Negroes, Hawaiians, Australian Bushmen, and all primitive races seem more susceptible, or at least succumb more readily to it, than the white European races who have been associated with it many centuries, and have developed a relative racial immunity. It is practically unknown in wild animals and birds, because they are not in contact with the bacillus, but when they are kept in captivity they develop it. All domestic animals and birds are liable to infection. Dairy cattle and swine are the most susceptible, and investigations have found as high as 10 to 15% of dairy cattle infected in some regions. Sheep, goats, horses, dogs, cats, rats, and mice are more difficult to infect, and seem to have a fairly high degree of immunity.

Types of bacilli. Three types of tubercle bacilli are distinguished: human, bovine, and avian. The human type is the most virulent for human beings; the bovine type most virulent for other mammals; it is difficult to infect mammals with the avian type.

II

PHYSICIAN AND PATIENT

" . . . The secret springs of action
Which lie between the surface and the show
Are disregarded; with self-satisfaction
We judge our neighbors, and they often go not understood."

"When thou feelest sick call upon God, and bring the physician; for a prudent man scorneth not the remedies of the earth." The same author, a contemporary of Hippocrates (about 400 B. C.), also says, "The skill of a physician shall lift up his head, and in the sight of great men he shall be in admiration."

Physicians at this time seem to have been held in high esteem. They were required to sign the Hippocratic Oath, which indicates an effort to maintain a high standard in the profession, and to exclude charlatans and quacks who seem to have been numerous in those days, and are still with us owing to the laxness of our laws in regard to such parasites. The oath is partly as follows: "I swear by Apollo . . . and by Aesculapius . . . that I will follow that system of regimen which,

according to my judgment, I consider for the benefit of my patients; and abstain from whatever is deleterious and mischievous; . . . With purity and with holiness I will pass my life and practise my art. . . . Whatever . . . I see or hear I will not divulge, as reckoning that all such things should be kept secret. . . . " An excellent motto for today, and some physicians still adhere to it.

Qualifications of Physician. The important thing for the patient is to secure a competent physician. The one who undertakes to treat tuberculosis should have not only a comprehensive knowledge of the disease, but also a thorough understanding of human psychology. He must remember that he is dealing with human beings, and not with experimental rabbits. And above all he must have firmness and personality enough to make the patient and attendants co-operate in the treatment. Mutual interest, sympathy, and kindness is a much more satisfactory policy than compulsion. But some few patients have the attitude of the Irishman toward volunteering, who, when asked why he did not volunteer for the army, said: "Sure it's me who would go willingly if they would only compel me."

When other things are equal, the more optimistic and enthusiastic the physician and patient are, the better will be the results. In such a tedious

and chronic disease as tuberculosis, patience, courage, and character are large factors in the outcome. Since there is as yet no specific remedy, such as quinine in malaria or serum in diphtheria, we must make use of every possible aid however small it may seem, and indifference must be replaced by interest and hope.

Mutual Understanding. I quote the verse at the head of the chapter to show the relationship which should not exist between physician and patient. If the best results are to be obtained in any given case there must be a mutual and sympathetic understanding and interest between physician and patient, and perfect candor in all matters. It is very easy for the patient to mislead the physician by giving him false information, or by withholding information, but such a course works harm only to the patient. I have seen patients do things which they knew they should not do, and then put down on their charts a normal temperature and pulse when they had fever and an increased pulse rate, in order that the physician might not suspect that they had disobeyed instructions. If they could fool the disease as well as the physician by such a course, it would be well and good, but they should not be deceived, the disease is not mocked, and they will have to reap what they sow. Success depends on thorough co-operation of physician and patient, and a larger share of the responsibility

rests with the patient, for if he does not carry out faithfully his instructions, the best advice is only wasted on him.

Confidence Necessary. Full confidence in the physician is necessary if the best results are to be obtained. If this is not possible, it is an injustice both to the physician and to the patient to remain under his care. It is therefore better to go to another physician in whom you have complete confidence and with whom you will co-operate fully.

Co-operation. Proper and successful co-operation depends on intelligence, close attention to details, and individualization. The patient should have a definite idea of why he is called upon to forego certain apparently harmless pleasures, to endure privations and hardships, and to adhere to a certain regimen of treatment. The physician should not ask or expect him to carry out measures faithfully for which he can give no adequate explanation. There are no grounds for secrecy in this disease, and the "take this medicine and ask no questions" attitude is a relic of supernaturalism and savors of quackery. The patient should be acquainted with the course of the disease, and prepared for the ups and downs that are sure to come if the disease is advanced. These periods of activity should not be called by misleading and euphemistic names, but should be explained on a physiological and pathological basis, and the pa-

tient should know that they are often unavoidable and not incompatible with a satisfactory progress toward recovery. His doubts and fears should be met in a sensible manner by the physician, and not left to the false explanations and meddlesome advice of his neighbors.

Candor. The dealings between physician and patient should be marked by perfect candor. The patient should know the truth, and be prepared to receive it and carry out instructions. Anxious friends and relatives sometimes request the doctor not to tell the patient if he finds evidence of tuberculosis. And later when the patient finds it out, he says with regretful tone, "How differently I would have acted if I had only known." The patient should know that in early cases several months of treatment are necessary, followed by many months of careful living; and in advanced cases many months of treatment will probably be necessary. He should know that it is a preventable, communicable, and curable disease.

Dr. F. M. Pottenger, who has had over twenty years' experience in treating tuberculosis, says: "I have never yet seen a patient who was seriously injured by telling him, in a proper and humane way, that he had tuberculosis. Imagine a physician telling his patient with appendicitis that he has 'cramps' or 'colic'. Imagine what his surgeon friends would say! Yet many of these same sur-

geons are informing their tuberculous patients that they have 'weak lungs,' 'throat trouble,' and other equally deceptive conditions. It is not sparing the patient to withhold from him the diagnosis of early tuberculosis and allow him to progress to an advanced condition. The patient's interests, as well as those of his associates, demand that the truth be known."

Caveat, Doctor. As a physician who has been in the pew of a patient for five years, let me beseech some of my former colleagues to be more considerate about adding unnecessary expense to the patient's already overburdened budget. The time is past for prescribing useless drugs merely to make the patient think that something is being done. Explanation and education are better and much cheaper. Consider! twenty dollars worth of antiphlogistine prescribed in one month by a well-known "specialist" for a patient who was making heavy financial sacrifices to remain under his care (this happened to my next-door neighbor)—caveat, doctor, the layman is becoming educated!

III

PHTHISIOPHOBIA AND THE CARELESS CONSUMPTIVE

"O wad some power the giftie gie us
To see oursel's as others see us!
It wad frae monie a blunder free us,
And foolish notion."

—BURNS.

Ignorance and Selfishness. Phthisiophobia, or an unreasonable fear of tuberculosis, is based on ignorance and selfishness, and is responsible for much undignified conduct and inhumanity towards careful and conscientious consumptives. It may be taken as a partial index of general ignorance concerning tuberculosis. Such an attitude has caused some patients to become unduly sensitive about taking the necessary precautions against the spread of the disease, and it has induced others, less scrupulous, to attempt to conceal their disease by failing to observe any precautions which might attract attention to themselves. The remedy for these unnecessary evils is an intelligent and humane attitude both on the part of the public and on the part of the consumptive. We need a cam-

paign of education that will protect the cleanly consumptive from prejudice and ostracize the careless man—not only consumptive, but also the careless and promiscuous spitter, and the individual who coughs and sneezes in the presence of others without covering his mouth and nose when he has a cold, bronchitis, or other respiratory infections which are much more easily contracted than tuberculosis.

No Danger to Adults. Adults have a marked resistance to tuberculosis, and their disease probably always comes from old foci acquired in childhood, and not from ordinary contact with consumptives. There is certainly no danger to the adult from a careful, cleanly, conscientious consumptive. The last war has offered unprecedented opportunities to observe the effects of the close association of tuberculous soldiers with healthy ones. Colonel Bushnell says: "Here is an experiment on a large scale; thousands of consumptives were put in closest contact with millions of healthy soldiers, and the result after four years is that it cannot be shown that such proximity did the well men any harm."

Children. For infants and children, however, there is real danger, and no precautions are too great for them. They should be most carefully protected from repeated and massive infections, and should live under the best hygienic conditions pos-

sible, as regards fresh air, sunlight, and good food, in order that they may be able to convert any slight infections which they may get into beneficent vaccinations which will increase their immunity to the disease. These precautions for children, however, in no way justify healthy adults in inconsiderate selfishness for their own safety (which is not in danger) and in social and business ostracism which is sometimes practiced. I quote the following from a pamphlet issued by the National Tuberculosis Association: "The best preventive measures against infection for those around the patient are healthy bodies and cheerful minds. . . . There need be absolutely no danger to anyone living with him, . . . and it is entirely unnecessary as well as very cruel to treat these patients, as is so often done, as though they had small-pox and could infect you at once."

Inconsiderate and Ignorant Fears. I mention the following absolutely unnecessary inconvenience and additional expense to which I was subjected by college students (not primitive, superstitious individuals, mind you, but inconsiderate, ignorant college students in the year of our Lord 1918). I sent for the college barber (about two blocks distant from my home) to cut my hair, and he sent word that personally he was not afraid to cut my hair, but that the students had told him that if he did they would not patronize him any more. And

so I had to send into the city (six miles) for a barber.

In 1803 Chateaubriand wrote in Rome: "I am in great difficulty; I had hoped to get two thousand crowns for my carriages, but, by a law of the time of the Goths, consumption is declared in Rome a contagious disease and as Madame de Beaumont drove two or three times in my carriages nobody is willing to buy them."

George Sand wrote in 1839 of Chopin, with whom she was traveling: "Poor Chopin, who had had a cough since he left Paris, became worse. We sent for a doctor—two doctors—three doctors—each more stupid than the other, who started to spread the news in the island that the sick man was a consumptive in the last stages. . . . We were regarded as plague-infected; and, furthermore, as heathen, as we did not go to mass. The owner of the little house which we had rented turned us out brutally . . . at Barcelona the landlord demanded to be paid for the bed on which Chopin had slept, on the pretext that it must be burned." (Chopin did not die until ten years later.)

No Mental and Moral Perversion. Dr. Knopf has called attention to the unjust criticism that consumptives are afflicted with mental and moral aberrations, and so deserve social ostracism on this ground. He quotes the opinion of the leading physicians who have had large experience with con-

sumptives, and it is hardly necessary to add that they all deny these charges. Dr. Osler said: "I have never noticed among consumptives any greater tendency to immorality or crime than in other individuals. I should rather say the contrary. . . . I should say emphatically that the average consumptive is neither inclined to brute selfishness nor any special distortion of the ethical perceptions." Dr. Trudeau said: "I have seen all the finer traits of human nature developed to the fullest extent by the burdens which chronic and fatal illness, often slow in its progress, adds to the sum total of what men and women usually have to endure in life. I have seen certainly more patience, courage, self-denial, and unselfish devotion to others in consumptives than I have noticed in the majority of healthy human beings. . . . History is full of instances which prove that tuberculosis does not interfere with the development to the highest degree of the intellectual, the moral, and the ethical sides of man's nature."

Stupid Prejudice. One often meets insane prejudice and near-sighted opposition to the establishment of a sanatorium on the part of town and village boards. And yet it has been proven over and over that sanatoria are a great help for a community instead of a danger. In the two German villages of Goebersdorf and Falkenstein, where the first sanatoria were established, and where five of

the most flourishing institutions have existed for fifty years or more, the mortality from tuberculosis among the inhabitants has decreased by one-third. This is due to the fact that the villagers voluntarily imitate the hygienic precautions which are in force in the sanatoria. And Saranac Lake has become a flourishing locality since Dr. Trudeau established the Adirondack Cottage Sanitarium there, increasing from a tiny village with a saw mill, a small hotel for guides, and a few scattered houses, when he went there, to a modern health resort of about 6,000 inhabitants.

Saranac Lake. In a recent careful survey of Saranac Lake, where 20% of the population have tuberculosis, Mr. Forrest B. Ames has shown that outside of tuberculosis families the infection of the resident population is less than in the average community. And he says: "Educational influence emanating from near-by sanatoria, and locally the 'open door' for the tuberculous into unrestricted industrial and social activities have done much to remove fear and ignorance and to create an intelligent public mind toward the disease. With this sane attitude existent the problems connected with the control of tuberculosis are becoming less and less difficult of solution." *

*A Tuberculosis Survey of the Residents of Saranac Lake, N. Y.—*American Review of Tuberculosis,* June, 1918.

Summary of Evils. The Swedish National Anti-Tuberculosis League has summarized the evils of phthisiophobia as follows:

Phthisiophobia

—paralyzes the struggle against tuberculosis.

—renders all measures against tuberculosis more difficult.

—facilitates the spread of infection.

—causes us to overlook the real danger.

—is a sign of shameful cowardice.

—causes cruel behaviour to consumptives.

—is an enemy to society that must be opposed.

The Careless Consumptive. The habitually careless, incorrigible, and vicious consumptives should not be tolerated. They are public nuisances and dangers to the community and should be forcibly segregated. The International Congress on Tuberculosis held in Washington in 1908 unanimously agreed that *the one great essential* for the prevention of tuberculosis is proper control of all open cases (*i.e.,* cases with bacilli in sputum), including forcible segregation of those who cannot be kept under proper control in their homes. And yet only seven of our states have passed any special laws looking toward the segregation of the criminally careless consumptive—New Jersey in 1911, and New York, Wisconsin, Minnesota in 1913, . . . Virginia in 1916, Rhode Island in 1917 and Iowa in 1919.

Dr. David R. Lyman in an excellent article on "The Control of the Careless Consumptive" in the March, 1918, number of the *American Review of Tuberculosis* cites a number of cases in point.

"*Case 7.* Married man with wife and two young children; man positive case, and no precautions whatever taken by patient or any of family. Patient refused any kind of treatment. All four *slept in same bed.*

"*Case 2.* Married woman; open case; refused sanatorium treatment, and refused to observe ordinary rules of cleanliness—spits on floor, etc. The visiting nurse stated, "Her two children had the measles when I called, and the little boy was in bed with his mother."

"*Case 10.* Girl; open case; immoral character; refuses sanatorium treatment; and other children in family, probably tuberculous, not allowed to be examined. It is easy to see what a menace she is to any community.

"*Case 3.* Peter ———, man who bums around town, spitting any and everywhere; was at a sanatorium, but was discharged on account of his intolerable conduct; now roams around and does as he pleases."

And he asks, "what is the use of continuing to close the stable after the horse has gone? Why spend our taxes caring for the developed active case in the adult and permit this continued inex-

cusable infection of children to go on? . . . we must begin at once to work for the provision of quarters where these cases can be committed by the health officer for such time as he decides the safety of the public demands."

We know that it is such cases as these mentioned above that are infecting helpless children every day; and we know that it is necessary to control by force such cases if we are to prevent the spread of tuberculosis, and ultimately eradicate this preventable disease. The cost of enforcing necessary preventive measures, and of maintaining institutions for the segregation of the careless, or homes for the proper care of exposed children, would be no more than the present cost of caring for indigent consumptives. And it would be a gradually diminishing cost, instead of a gradually increasing one as it is now. But we still lack the public sentiment and legislation necessary for the accomplishment of these ends. Can anyone continue to claim, with the least shadow of justice, that the right of the adult to do as he pleases is greater than the right of the child, who cannot determine its environment, to be protected from this adult—even though it be his parent?

IV

HEALTH VS. PATENT MEDICINES, CHARLATANS, AND CHRISTIAN SCIENCE

"Give me health and a day, and I will make the pomp of emperors ridiculous."

—EMERSON.

"The American people like to be frazzle-dazzled."

—BARNUM.

Health is the foundation of success and the keystone in the arch of happiness. The bloom and buoyancy of health aid greatly in camouflaging physiognomic and mental defects, and render contagious the good fellowship and contentment of its possessor. It is passing strange that most of us take no thought of such a vital factor and have no intelligent plan for conserving this most valuable asset.

In the matter of investing a hundred dollars, or in a conflict with the law, we seek the advice of one qualified by special training and experience to give an intelligent opinion; but when signs of failing health appear we are willing to take the advice of a

deluded ignoramus whose vacant countenance and grateful smile beam upon us from above an advertisement and assure us that Tanlac has cured his stomach trouble, or that Sarsaparilla keeps his blood so pure that no malicious germs can obtain board and lodging in his tissues. Nuxated Iron enabled Jess Willard to lick Jack Johnson, and so steadied Ty Cobb's nerves that he reached the dizzy heights of leading the American League batting average. (Query: What enabled Ty to lead the batting average for about ten consecutive years before Nuxated Iron discovered him? And why did it fail Jess so miserably in his encounter with Jack Dempsey?) It is worth noting that the *Journal of the American Medical Association* has collected and published at least three testimonials on Tanlac which were published after the patient had died from the disease of which the testimonial states that Tanlac has completely relieved him.

Patent Medicines. Patent medicines all have practically the same ingredients, namely, a narcotic, a laxative, and a bitter. These three "stand-bys" are advertised to cure everything, and especially "incurable diseases." The following story which sheds real light on the morals and sincerity of at least two opulent harpies of the trade came to light several years ago. One of them proposed a bet with the other that he could first prepare a medicine and then obtain testimonials (without pay)

stating that the medicine had cured any disease which the party of the second part might be pleased to name. Large stakes were put up, the "medicine" was advertised, and the testimonials gathered in—and in addition to winning the bet the medicine was a financial success.

The chief effects of patent medicine upon the patient are due to the psychic element which is stimulated by the extravagant claims, fraudulent advertising, and testimonials emanating from deluded ignorance and well-greased palms. But, of

TANLAC

Holyoke Daily Transcript

HOLYOKE DAILY TRANSCRIPT, FRIDAY, MAY 11, 1917—20 PAGES

THREE IN ONE FAMILY MAKES UNUSUAL CASE

South Hadley Falls Man Relieved of Stomach Trouble Since Taking "Tanlac," the National Tonic.

I HAVE GAINED 10 POUNDS

Says Fred Wick, and My Wife and Son are Also Taking Tanlac and Have Been Greatly Benefited

FUNERALS

WICK—The Funeral of Fred Wick was held this morning from his home, Granby Road, South Hadley Falls.

Two clippings from the *same paper!*

One says "Tanlac" relieved Mr. Wick of " Stomach trouble."

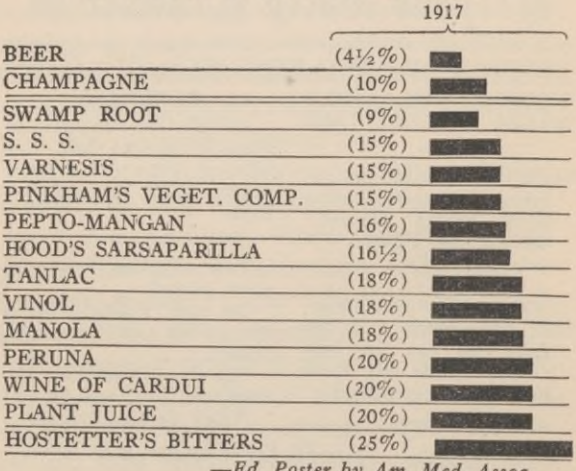
The other shows that Mr. Wick *was dead and buried!*

Which do you believe?

—Ed. Poster by Am. Med. Assoc.

course, these effects are only temporary if the patient has real organic trouble. Dr. Martin demonstrated this psychic effect in a well-known experiment on some of his tuberculous patients. He led them to believe that a wonderful serum for the cure of tuberculosis had been discovered, and then injected them with a common salt solution. A marked improvement in subjective symptoms and feelings was noted, and when the injections were discontinued a return of the old status appeared. It is this psychological element which makes consumptives pitifully easy victims for those parasites who advertise worthless consumption cures.

ALCOHOL COMPARISONS



—Ed. Poster by Am. Med. Assoc.

The patent-medicine fraternity have shown themselves to be absolutely unscrupulous in their methods and conscienceless exaggerators and prevaricators in their advertisements. Several hundred "cures" are being exploited for diseases which are absolutely beyond the reach of drugs. Our trademark laws give these proprietors a perpetual monopoly which makes extensive advertising profitable, and leads to the great abuses which make patent medicines a menace to public health. Modern advertising methods seek to make the well man believe that he needs a "purifier" or stimulant, to cause those suffering from trivial ailments to dose themselves unnecessarily, and to make the sick believe that these medicines are panaceas for whatever ails the public. No one has the moral right, nor should he have the legal right, to sell products

TESTIMONIALS ARE WORTHLESS

The subjects of these testimonials for a "consumption cure" *all died of consumption.* (Original poster shows five photos with testimonials.)

These testimonials were honestly given. The consumptive optimistic over a new treatment believes he has been benefited. Then the testimonial is secured. The *victim dies* but his *testimonial lives on!*

Quacks and nostrum exploiters find no difficulty in getting chemist's certificates—of a kind! Here is the kind furnished by W. H. Morse for cures for consumption, epilepsy, blindness, etc.

"F. S. Sc. (Lord)" after one's name looks imposing. It costs $5.00.

—Modified from Ed. Poster by Am. Med. Assoc.

under grossly exaggerated and false claims, so as to induce the public to magnify imaginary and trivial ailments and dose itself unnecessarily and indiscriminately. Medicines for self-treatment should not be secret preparations, should contain no dangerous or habit-forming drugs, and should not be recommended for diseases that are obviously too serious for self-treatment. Yet these very things furnished the life-blood of the obnoxious business. (Such remedies for home use are included in the U. S. Pharmacopeia and are available for the public if they only knew it and would call for them.)

If all patent medicines were abolished not only would the general health be improved, but the people would be saved over $100,000,000 annually, and, most important of all, those suffering from serious troubles would not reduce their chances of recovery by delaying proper treatment through trying out worthless medicines first. True, the newspapers would lose $40,000,000 or more per annum in advertisements, but their gain in self-respect should be more than worth it.

Charlatans. Where the qualified physician is compelled by knowledge and truthfulness to be conservative and indefinite as to promises of cure, the quacks are most cocksure in their false assurances. As proof of their claims they offer the testimonial of some vain woman who received a bonus of a few photographs for sending one along with her testi-

mony, or that of a renegade doctor who is well paid for his lies. The patient should not be misled by these, but should recognize as sure signs of quackery any display of testimonials, claims of a new discovery or "special methods," form letters, and special and reduced rates.

When such different agents as a dose of medicine, a massage, an electric magnet, a blest handkerchief, or Christian Science are supposed to relieve the same malady, it should be evident that none of them has a specific effect on the malady, but that it is relieved by natural methods in due course of time. About eighty-five per cent of people will recover from their troubles regardless of what is done for them, and so this gives the quacks, patent medicine vendors, faith and mental healers a pretty good percentage to point to as "their cures." But in every serious organic trouble such as tuberculosis, nephritis, cancer, heart and blood-vessel diseases, etc., patent medicines and quacks are positively harmful, and Christian Science becomes harmful in keeping such patients away from the proper medical advice and treatment.

The guardian and adviser on matters of health should have a minimum training of four years high school, two years college, four years medical school, and one year hospital experience, and should not be bound by the narrow tenets and practices of any system such as Osteopathy, Christian Science, Chi-

ropractic, et al., but should have an unprejudiced mind toward any measure that might prove helpful. Only such a qualified adviser should decide whether the patient needs a dose of medicine, an Osteopathic rub, Christian Science gas, an operation, or any definite regimen of treatment.

Christian Science. Mrs. Eddy, a firm believer in malicious animal magnetism (sometimes known as witchcraft), suffering from delusions of persecution, discharging and bringing suit in turn against three of her associates for "wishing evil" on her, sued by her own son on grounds of insanity, too busy to save her husband's life who, according to her own written statement, died from absorbing evil thoughts aimed at her by her enemies, was the human paragon chosen by God to reveal His methods of healing to mankind—methods which Christ used, but forgot to impart to His disciples, as one would infer from the preface to "Science and Health."

Just why He waited over eighteen hundred years to correct this oversight, and until she was well past middle age and had been an irascible neurasthenic for several years and a patient of Dr. Quimby's, who used "mental suggestion" in treating her, she does not say. Anyway, after her association with and treatment by Dr. Quimby, who used hypnotism and mental suggestion in treating many of his patients, the "light" dawned upon her, and she was

quick to capitalize credulity and hope by bolstering it up with a religion.

"E'en ministers they hae been kenn'd
In holy rapture,
A rousing whid at times to vend,
And nail't wi' scripture."

Dr. William J. Mayo says, "Among all peoples in all times, the prevailing religion has been successful in relieving sickness, so far as mental suggestion could give comfort or indirectly affect the physical condition. Christian Science has capitalized and commercialized the mentally healing virtues of Christianity."

If their healers would acknowledge their limitations and confine their attempts to the benefits that come from mental suggestion, and not try to treat serious organic troubles, except under the direction of a qualified physician, their efforts would be laudable. The benefits of Christian Science are explainable on physiological grounds, and not on the basis of being in "perfect attunement" with the Divine "Spirit." The beneficial influence of the mind (cheerfulness, hope, courage) has long been recognized in medicine, and used before Mrs. Eddy "borrowed" the idea from Dr. Quimby.

The situation is stated tersely by Drs. Fisher and Fisk*: "They sometimes succeed in the 'real

* Fisher and Fisk: How to Live, Funk & Wagnalls Co., 1915.

cure of imaginary ailments,' and the 'imaginary cure of real ailments.' In the latter case the mental contentment lasts only until the real ailment becomes too aggressive to be ignored." It is in such cases that their meddlesome interference and unfortunate influence is harmful. It is criminal to withhold operation, or radium or x-ray for cancer at the earliest stage possible; to tell a consumptive in the early stages of the disease that his trouble is all in his mind and have him go about his work as usual and thus reduce his chances of securing an arrest of the diseases to almost nothing; to give a diabetic or nephritic any and everything he may want to eat, etc., *ad mortem.*

Even more pernicious is the opposition of Christian Scientists to measure against preventable diseases and hygienic living. In truth, if they had their way, we would have a return of the scourges of the dark ages. Smallpox, plague, malaria, typhoid, typhus, dysentery, etc., would rage and flourish unopposed, while they sat by and impotently read "Science and Health" to the victims—or probably fled to distant parts and gave "absent treatment." Such procedure is not essentially different from that of the "medicine man" of savage tribes who decorates himself in frightful garb and beats upon his tom-tom to drive away the evil spirits, except that the noise of the tom-tom is replaced by the vaporous verbiage of "Science and Health."

Signs of the Time. It is encouraging to turn from these small groups of misguided, credulous, and essentially ignorant faddists who are opposing progress toward the goal of public health, "On which rests the happiness of the people and the power of a country," and read the signs of the time in the increasing popularity of sleeping porches and hygienic living and working quarters; the pure food laws, and demand for uncontaminated water supply, certified milk and inspected meat; and to note the enlightened opinion behind the organized campaign to protect the youth from contagious diseases.

Temperance, good food, regular bowels, avoidance of prolonged physical and mental over-strain, proper amount of rest, recreation, fresh air, and a cheerful and serene disposition, together with periodic physical examinations, are the chief preventive measures against disease and old age.

V

TEMPERAMENTS AND TUBERCULOSIS

"I like the man who faces what he must
With step triumphant and a heart of cheer,
Who fights the daily battle without fear,
Sees his hopes fail, yet keeps unfaltering trust."

Varying Reactions to Tuberculosis. The chief difference between human machines and other awe-inspiring mechanisms created by the genius of man lies in their reacting power. No two human temperaments will react alike to any given stimulus, and the same individual will vary according to circumstances. It is not surprising then that such a spectre as tuberculosis should cause all manner of reactions exemplifying those immortal words, "What fools ye mortals be."

Fear seizes one; a vision passes before his eyes, and he is ready to give up the ghost. Folly persuades another to take "one last fling," which may add many months to his period of "chasing the cure." Shortsightedness tells one he can't afford to stop now, but fails to add that it will take ten times as much time and money if he waits for the breakdown to come. Discouragement beclouds

good judgment, and adds, "What's the use, I don't care what happens." Wisdom lingers with a few and says, "It's bad enough to lose your health; don't make the situation worse by losing your head."

If recovery depended upon doing some big and spectacular task we would bend every energy to the contest; but, since success depends chiefly on renunciation and apparently doing nothing, many are confounded and defeated by the very simplicity and tediousness of the task. They are like Naaman the Syrian, who, when Elisha told him to wash seven times in Jordan, said: "Are not the rivers of Damascus better than all the waters of Israel? Could I not have washed in them and been clean? Behold, I thought he would surely come out to me and stand and call on the name of the Lord his God, and wave his hand over the place and heal the leprosy." So he turned away in a rage, but his servants besought him saying, "If the prophet had bid thee do some great thing wouldst thou not have done it? How much rather then when he saith to thee, 'Wash and be clean.' "

Worry is almost inevitable in the early reactions. It is no use telling a patient not to worry. He must achieve that state of mind by practice and discipline of his will-power, and not until he accomplishes it does he put himself in the fair way to recovery. The chief business now is to get well. All other considerations must stand aside if he is to put up

his best fight. "Drag your thoughts away from your troubles . . . by the ear, by the heels, or any other way so you manage it."

Alice Freeman Palmer. The case of Alice Freeman Palmer is very instructive. Her busy, successful and interesting life may be briefly summarized as follows:

Born on a farm in an obscure border village.

She learned to read at three; went to school at four; and at five looked after the three younger children in the family.

She determined that she would secure the best education open to women in her day, "if it took fifty years to do it." She decided on the University of Michigan, and ended with the degrees of Ph.D., D.Litt., and LL.D.

At twenty-two she was principal of a high school in Michigan; at twenty-four professor of history at Wellesley; at twenty-six president of Wellesley. At thirty-two she resigned the presidency to marry Professor Palmer of Harvard. Four years later at the urgent request of President Harper she served as Dean of Women in the University of Chicago for four years.

At the 1920 election of "Immortals" for the Hall of Fame at the University of New York she was the only woman elected.

At the age of twenty-five she developed tuberculosis. Dr. Bowditch of Boston told her that she

must give up her work, and advised a trip to Southern France, warning her that unless great precautions were observed she would have only a few more months to live. On her way home she consulted Dr. Willard Parker in New York and recorded this note, "Dr. Parker tells me I can live if I have character and courage enough." She devoted herself entirely to the task of getting well, and after several months of rest cure at home made a good recovery, and never had any further trouble from tuberculosis. It was said of her, "She seldom hurried, never worried, admitted no regrets for the past or anxieties for the future."

The Metal of the Patient. We do not fully appreciate the value of health until we have lost it. The mental reaction which then ensues reveals the metal of the patient. Some poor souls thereupon pine away by dwelling on the mistakes of the past and blaming others unduly for their share and influence in them, while the more philosophic and successful realize the folly of crying over "spilt milk" and at once set about to regain the lost treasure. The stern philosophy of Marcus Aurelius should prove helpful for some:

"Look on every man who evinces pain or dissatisfaction at any event as on a level with the pig that is led out to sacrifice kicking and squealing. . . . The healthy mind will cheerfully accept all vicissitudes of fortune, while that which repines, 'O let me

live,' or, 'Let all men praise my doings,' is on the level with the eye that will see nought but green, or the teeth which accept only the tenderest morsel, which is nought but a token of disease."

I recall a woman who used to go about the sanatorium in her rustling silks and pour forth her woes and "beg" for sympathy as if she were the only person that ever had her plans and pleasures interrupted by tuberculosis. In contrast there was another patient, extremely ill, and although he realized there was little hope, yet his face was always bright, he had a word of encouragement for everyone, he radiated cheer and optimism, he was putting up the best fight he could. Other patients liked to visit him, because they felt that their storage batteries of courage and hope had been freshly charged when they left.

Some are inclined to look upon the period of cure as a barren waste, as time irreparably lost. This will depend on the attitude and reaction of the patient. He can make it a period of profit, a period of reading, practice in self-control, and emerge a better citizen and neighbor, with keener appreciation of altruism, more self-reliant, and less dependent on others for the things that furnish the joy of living. Mark Twain offers a good example:

"I have been sick a-bed, the first time in twenty-one years. How little confirmed invalids appreciate their advantages. I was able to read the English

edition of the Greville Memoirs throughout without interruption, take my meals in bed, neglect all business without a pang, and smoke eighteen cigars a day."

Professor Phelps said of Robert Louis Stevenson, a sufferer from tuberculosis for twenty-two years, "Prone in bed, when his attention was not diverted by a haemorrhage, he lived amid the pageantry of gorgeous day dreams, presented on the stage of his brain." His joy in and love of life are expressed in the following aphorisms by him: "There is no duty we so much underrate as the duty of being happy"; "To travel hopefully is better than to arrive—the true success is in labor"; and, "Keep your fears to yourself, but share your courage with others."

A Chance for Mental Activity. If our physical activities are limited, our mental faculties have a better chance to flourish. As Cephalus said to Socrates, "As the pleasures respecting the body become insipid, the desire and pleasure of conversation increase," or, as Mark Twain put it, "The chief pleasure consists in the wagging of the gladsome jaw and flapping of the sympathetic ear." No wonder that many patients fall into boredom when separated from business and professional duties, because they have never thought of anything else, never read what others have thought and said about subjects that have interested brilliant minds. "Books are true levelers. They give to all who

faithfully use them the society of the best and greatest of our race." Don't lock your mind in "solid ivory" when such questions as, "If a man die shall he live again?" knock for entrance. And I am inclined to believe that there are few who will not revise their philosophy of life and greatly improve their future conduct by such a period of trial, of study, and reflection.

Everybody admires a cheerful loser. Our cherished dreams may be rudely broken up, and some by delay, some by folly make recovery impossible, and some have to fight a losing battle from the start; but we can display fortitude, and spiritual victory is possible for all. Dr. Trudeau has expressed in a nutshell the kernel of "t. b." philosophy, "To cease to rebel and struggle and to learn to be content with part of a loaf when we cannot have a whole loaf, though a hard lesson to learn, is good philosophy for the tuberculous invalid; and to his astonishment he often finds that what he considered the half loaf, when acquiesced in, proves most satisfying."

The story of Sidney Lanier and his battle with tuberculosis and poverty, and of how he preserved his passion for music and poetry and scholarship, is one of the most heroic and inspiring in the annals of men. He was always hopeful and buoyant. In 1872 he wrote to his father from San Antonio where he was "chasing the cure," "I feel today as if I

had been a dry leather carcass of a man into whom someone had pumped strong currents of fresh blood, of abounding life, and of vigorous strength. I cannot remember when I have felt so crisp, so springy, and so gloriously unconscious of lungs."

It is of no consequence whether we live or not, but it is of the greatest importance to practice virtue while we do live. But do not give up the ghost at every crisis. You may feel like Job when he said, "Why did I not give up the ghost when I came out of the belly? Hast Thou not poured me out as milk, and curdled me like cheese? Yea, he hath taken me by the neck and dashed me to pieces." But remember that, "After this Job lived an hundred and forty years, and had 14,000 sheep, 6,000 camels, 1,000 yoke of oxen, and also seven sons and three daughters." And remember that Dr. Trudeau, after eight years of "chasing the cure," much of the time in bed, and after many apparently hopeless periods, did his greatest work.

The remarkable case of John Burns, reported in the *Journal of the Outdoor Life,* is another most encouraging example. "The first seven years are the worst," said Mr. Burns, when asked for particulars about his case.

The first year was spent literally in chasing the cure, from climate to climate and from doctor to sanatorium. He returned home and continued to get worse. After a few weeks he entered a local

sanatorium and for six years lay on his back, unable even to attend to his toilet, and often having to be fed. During these six years he had five hundred haemorrhages.

"Smiling and uncomplaining, he kept on, patiently following the doctor's advice, until now, after eight years, he has achieved what is termed 'full exercise' and is able to visit his home for a few days now and then. He has regained his normal weight and is a very healthy looking specimen of the genus homo. There is no need for anyone to despair—think of John Burns, smile and get well."

"It's the plugging away that will win you the day,
So don't be a piker, old pard!
Just draw on your grit; it's so easy to quit:
It's the keeping your chin up that's hard."

VI

DISTINGUISHED "T. B'S."

"He alone is great
Who, by a life heroic, conquers fate."
—BOLTON.

"We are part of all we have met"—certainly no one has been introduced to tuberculosis and come off an unchanged man! The lessons of patience, courage, endurance, and hope turn out some truly noble and purged souls—souls attuned to the broadest and most sympathetic interests of mankind, and skilled in surmounting obstacles and overcoming handicaps. It is my purpose, and pleasure, to present a few of these characters for the encouragement and guidance of those who are apt to become a little scorched, instead of purified, in the fiery furnace. "If thou find aught in the life of man more excellent than a mind at peace with itself . . . , and at peace with destiny in the lot she assigns thee without thy choice . . . if," says Marcus Aurelius, "thou canst behold aught more excellent than this, turn to it with all thy soul and enjoy the highest to the utmost."

Trudeau. No one can qualify with higher marks

for this chapter than the late Dr. Edward Livingston Trudeau (1848-1915). His experience with tuberculosis began in 1865 when he nursed his brother through an acute and fatal attack of the disease. He said, "It was my first great sorrow,—and I have never ceased to feel its influence. In after years it developed in me an unquenchable sympathy for all tuberculous patients—a sympathy which I hope has grown no less through a lifetime spent in trying to express it practically." Indeed, this was only the beginning of many great sorrows and trials which filled his cup of life. A few years later the same disease that had taken off his brother so quickly banished him from a most promising practice in New York to the Adirondack wilds. Three of his four children were taken from him; one in infancy, and two at the threshold of maturity—one with tuberculosis, and the other with pneumonia. His labors were frequently interrupted by relapses of tuberculosis, causing long periods of invalidism. Truly it can be said that "he was a man of sorrows, and acquainted with grief," but it never broke his indomitable spirit, and only deepened his symapthy and interest in his fellow sufferers, and strengthened his desire and determination to serve them.

His ancestors for several generations had been physicians, and he finally decided to study medicine, after drifting a while with his pleasure-loving

companions. When he announced this decision to his club mates one of them offered to bet $500 that he would never graduate—and "no one was found to take the bet," says Dr. Trudeau. "This was the turning point between an easy life of pleasure to one of work and responsibility. After this my evenings were generally spent in the little hall bedroom with my anatomy instead of at the club with my boon companions."

The teaching on tuberculosis at this time (1868) was very meagre. The tubercle bacillus had not been discovered, and tuberculosis was considered a hopeless disease. He tells of his experience in going down to New York from Saranac twelve years later in order to learn how to stain the tubercle bacillus which Koch had discovered in 1882. Even for several years after this "leading" physicians did not take much stock in germs, and the tubercle bacillus in particular. When he returned from this trip he found a Harvard student at Saranac who had come to consult Dr. Loomis, a distinguished New York physician, who was on a hunting trip there at this time. In the meantime Dr. Trudeau examined the patient's sputum by his newly learned staining method, and found tubercle bacilli in it. This convinced him that the patient had tuberculosis in spite of the fact that the physical signs were slight and indefinite. When Dr. Loomis returned from his hunting trip, he examined the patient and found no

definite signs. Dr. Trudeau then told him about finding the bacilli in the sputum. But Dr. Loomis only smiled, and said that he didn't have much faith in germs anyway. He sent the patient back to Harvard, and four months later he had a profuse haemorrhage, which convinced Dr. Loomis that Dr. Trudeau was right. Dr. Loomis was afterwards one of Dr. Trudeau's strongest supporters.

Adirondack Cottage Sanitarium. When Dr. Trudeau discovered that he had tuberculosis his love of the woods and hunting drove him up to the Adirondacks in spite of the protests of his friends and physicians. This life in the open and on the lake, where he spent the first five years of his illness, brought about an arrestment of his disease. He was then anxious that other patients should have the advantages of this open-air life and mountainous climate which had done so much for him. He was also favorably impressed with the sanatorium idea which Brehmer and Dettweiler had tried with such marked success in Germany, and decided to try it there at Saranac. Accordingly the Adirondack Cottage Sanitarium was started in 1884 with a very humble and meagre beginning. This was the pioneer institution in this country and he fully demonstrated and established its value in the treatment of tuberculosis. His magnetic personality and unbounded sympathy and interest in his fellow sufferers attracted all classes of patients to these moun-

tains, and now Saranac Lake is the most flourishing tuberculosis resort in the country.

He determined that the poor, as well as the rich, should have the advantages of this sanatorium, and accordingly he gave his services to the institution entirely free, and charged for board, etc., far less than the cost. This deficit, amounting to from $12,000 to $25,000 a year, he made up by begging subscriptions from his friends for a period of twenty years or more, until in 1914 he had accumulated a productive endowment of over $600,000 for the sanatorium, in addition to the thoroughly equipped laboratory and adequate buildings and grounds—truly a great monument to his ceaseless efforts and unflagging zeal!

In the early years of the sanatorium he devoted much time and work to research in his laboratory. A characteristic light is shed on his ideals in the following statement about Robert Louis Stevenson, his distinguished patient: "He could not, as I could, look over and beyond these painful associations with which I lived in daily contact at the Sanatorium and the Laboratory, and see, as I did in my ideals, the glorious hope of future relief to humanity from sickness, suffering and death which lay in the study of disease at the bedside, and of infection and germs and sick animals in the Laboratory. This was the light which was so bright to me that I never noticed the smell of oil which overcame Stevenson."

Dr. Trudeau lived to see the fruits of his labors at Saranac returning an hundred fold, and to receive the highest honors his colleagues could bestow upon him. He was the first President of the National Tuberculosis Association; President for the United States of the International Congress on Tuberculosis held in Washington in 1908; and President of the American Congress of Physicians in 1910. No one was ever held in higher esteem by his patients and colleagues. His autobiography, from which I take the above incidents, is a most encouraging and interesting account of a busy, successful, and highly useful life handicapped by intermittently active tuberculosis for over forty years.

Grancher. Professor Jacques Joseph Grancher (1843-1907), of Paris, taught and practiced among consumptives for twenty-five years, when he was taken off by an untimely death from tuberculosis. The French have been the pioneers in protecting children from tuberculous infection, and it is due to Dr. Grancher's clear perception and strong conviction of the importance of this measure. He realized clearly that by far the most successful point at which to attack tuberculosis was in preventing the infection of children. He founded the Grancher Society whose purpose is to find homes for children of poor tuberculous families among healthy peasant families, and thus remove these helpless children from the danger of infection from their ignorant,

careless, and often helpless parents. These children are returned to their families at the age of thirteen if the parent has been cured or has died, and the danger of infection thus removed. At the outbreak of the War this Society had 810 children under its supervision—only a small proportion of the thousands who need such help, to be sure; but it is pointing the way, and enlarging its activities as rapidly as it can obtain the co-operation and financial help required. At the time of his death Dr. Grancher had planned and was working for the establishment of a "Sanatorium School" for children with latent tuberculosis, where they could have "double rations" of fresh air, rest, good food; and a "half ration" of work. The need and usefulness of such institutions is now apparent to all—only the public interest and funds are lacking!"

Dettweiler. Dr. Peter Dettweiler (1832-1904) was an army surgeon in 1870 when he developed tuberculosis and went to Dr. Brehmer's sanatorium at Goebersdorf, Germany (the first one established), where he recovered his health. He became Dr. Brehmer's assistant, and after six years established his own sanatorium at Falkenstein, which has been since its establishment "the Mecca for students of tuberculosis all over the world." He was the first to recognize fully the importance of rest in the treatment of tuberculosis, and he introduced the "open-air rest cure on the reclining chair." He

founded the first sanatorium for the consumptive poor, and it is to his initiative that Germany is indebted for her many institutions of this sort. Dr. Knopf said of him, "He was a charitable man, of unusual cordiality and kindness and strong personality—a friend, confessor, and physician to his patients." Dr. Baldwin said, "He began life as a tuberculous invalid, and in consequence of ill health was considerably deprived of advantages; but his delicate frame was animated by a determination and spirit that surely carries its lesson to those who look forward with doubts weighing heavily upon them."

Laennec. René Théophile Hyacinthe Laennec (1781-1826) was the most important and distinguished internist of the early French school, although an early victim of tuberculosis. His invention of the stethoscope in 1819 opened up the possibility of accurate diagnosis of diseases of the heart and lungs, and at the same time made his name immortal. He was the first to recognize pneumothorax in a living patient, and described accurately its signs; the first to discover and describe the "anatomical tubercle"; the first to recognize bronchiectasis, haemorrhagic pleurisy, gangrene and emphysema of the lungs; and he was the author of many terms which are now used in describing the physical signs in the chest. He was slight in stature, generous, tolerant, modest about his work,

and stands out as one of the greatest clinicians of all ages.

The medical profession contains many names that are worthy of a place in this chapter, but the size and scope of this little book permits the selection of a few only. This is also true of the field of literature; and the following names selected from the various walks of life.

Lanier. Sidney Lanier (1842-1881) was a son of the Old South, reared in a cultured and prosperous family according to the principles of chivalry and sociability which were in vogue in the South before the War. He graduated from Oglethorpe College, Milledgeville, Georgia, at the head of his class in July, 1860, and spent the rest of the summer on the estate of his grandfather at Montvale Springs in the mountains of East Tennessee. A glimpse into the life of that time is expressed in the following extract from one of his letters: "I have up here in the mountains,—kinsfolk, men friends, women friends, books, music, wine, hunting, fishing, billiards, tenpins, chess, eating, mosquitoless sleeping, mountain scenery, and a month of idleness."

In the fall of the same year he returned to his Alma Mater as a tutor. He describes himself at this time as "a spare-built boy, of average height and under-weight, mostly addicted to hard study, long reveries, and exhausting smokes with a German

pipe." The question uppermost in his mind at this time was that of a vocation. He had inherited the musical genius which was a marked trait in the Lanier family—Pepys mentions the "music-loving Laniers" in his diary. He had a decided bent and extraordinary talent for music and poetry, but they were not considered a "man's job" in his day and locality.

His dreams of scholarship, music and poetry, however, were interrupted by the War from which he emerged broken in health and with the property of his family entirely swept away.

At home, at college, in war, and in prison he entertained and charmed his friends and associates with his flute. A fellow prisoner of war said, "Many a stern eye moistened to hear him, many a homesick heart for a time forgot its captivity." He secured his release from prison through some gold which a friend smuggled into prison in his mouth. Extremely emaciated and weak he was rescued from death on board the ship in which he was sailing for Fortress Monroe by an old friend who chanced to be present. She relates the incident as follows: "There in that horrible place dear Sidney Lanier lay wrapped in an old quilt his thin hands tightly clinched, his face drawn and pinched, his eyes fixed and staring. . . . At last he turned his eyes slowly about until he saw Lilla, and he murmured: 'Am I dead? Is this Lilla? Is this heaven?' . . . We

gave him some hot soup and more brandy, and he lay quiet until after midnight. Then he asked for his flute and began to play. As he played the first few notes you should have heard the yell of joy that came up from the shivering wretches down below, who knew that their comrade was alive. And there we sat entranced about him, the colonel and his wife, Lilla and I, weeping at the tender music as the tones of new warmth and color and hope came like liquid melody from his magic flute."

After the War he was a clerk and teacher in Alabama for a while, and then he studied and practiced law with his father in Macon, Georgia, until 1873. His passion for music and poetry finally prevailed and he went to Baltimore where he played the first flute in the Peabody Symphony Orchestra. In 1879 he was made lecturer on English Literature at the Johns Hopkins University. His health during these years was very poor, and he made frequent trips to Florida and North Carolina in the effort to build up his waning health—spasmodic attempts at "chasing the cure." In spite of his poor health he made most rapid progress and remarkable achievements for such a short time in the field of literature. He was a brilliant exponent of music in poetry as "The Marshes of Glynn" and "The Song of the Chattahooche" attest, and second only to Poe in the art of onomatopoeia.

"His personality is one of the rarest and finest

yet produced in America," says Professor Mims. And Dr. Gilman, President of Johns Hopkins, said of him, "He always preserved his sweetness of disposition, his cheerfulness, his courtesy, his industry, his hope, his ambition. . . ."

Stevenson. Robert Louis Stevenson (1850-1894) was a peripatetic chaser of the cure, trying Davos, Bournemouth, Riviera, the Adirondacks, California, and finally Samoa, where he established his home in 1890—not a very wise course for a consumptive to pursue! "Where is Samoa?" asked a friend. "Go out of the Golden Gate and take the first turn to the left," replied Stevenson.

His sensitive and idealistic nature made him far from a model patient. Dr. Trudeau said of him when he was a patient at Saranac: "His view was to ignore or avoid as much as possible unpleasant facts, and live in a beautiful, strenuous, and ideal world of fancy. He did not care to go to the sanatorium with me, or to see the laboratory, because to him these were unpleasant things." One day, however, Dr. Trudeau got him into the laboratory from which he escaped at the first opportunity with the words, "Trudeau, your light may be very bright to you, but to me it smells of oil like the Devil!"

He was a native of Scotland; developed tuberculosis at the age of twenty-one; four years later he was admitted to the bar, but his literary talents far outshone his legal lights, and he finally devoted

himself entirely to literature and "chasing the cure." Success first came with the publication of "Treasure Island," in 1882, followed by the masterpieces "Dr. Jekyll and Mr. Hyde," "The Master of Ballantrae," "Kidnapped," etc.

Schiller. Johann Christoph Friedrich von Schiller (1759-1805) was Germany's greatest dramatic poet, if indeed, not her greatest litterateur among a field of formidable competitors. He desired to become a clergyman, but was "kindly kidnapped" by Duke Karl of Wuertemberg for his military academy in 1773. However, in 1775, he began the study of medicine, and in 1780 was a regimental surgeon, but he found both his dress and duties galling. In 1781, he published "Die Rauber," which was a vigorous protest against existing political conditions of which he had been a victim. He was thereupon forbidden to publish anything except medical treatises. However, his literary genius was too great to be stifled by any such autocratic and bigoted order, and Germany was not deprived of her greatest dramas which he later produced, "Wallenstein's Tod" and "Wilhelm Tell." They made a deep and enduring impression on the German mind.

Democracy never had a more eloquent champion and her principles were never more clearly set forth than in his "History of the Revolt of the Netherlands," in which he defends Queen Elizabeth of

England for having taken Holland's part against the cruelties and oppression of Spain. Whether the tubercle bacilli had anything to do with purging his mind of modern Prussian bigotry and cruelty I won't say, but surely nothing was ever written that strikes the present ex-German Emperor more squarely in the face than the following quotations from "The Revolt of the Netherlands."

"Policy and humanity demand that a wrong perpetrated against a nation should be taken note of on all hands and punished. The interests of society at large clearly demand that the fundamental laws of states be not violated with impunity; society must not remain passive in face of the deliberate provocation of a blind and outrageous tyrant. The common interests of mankind must direct the impulses of political bodies: European society has no other essential purpose. What? A whole nation should look on with indifference when the blood of her neighbors is spilt by the absurd and barbaric whim of a despot?—all values revert back to the original conception of right to claim support and generous help for an oppressed people —the primeval and holy right of unhappy peoples."

After the publication of "Wilhelm Tell" in 1804 Schiller was invited to Berlin and "royally" welcomed. On his return from this trip, he was prostrated by illness and died in 1805—having suffered from tuberculosis since 1790.

Molière. Molière (1622-1673) holds the same place in French literature that Schiller does in German—the greatest dramatist of France, if not her greatest literary genius. Shakespeare should have had tuberculosis in order to make it unanimous—he is the exception which proves the rule that tuberculosis produces the world's greatest dramatists!

The physician in the time of Molière, to quote Dr. Garrison, "had become a sterile pedant and coxcomb, long-robed, big-wigged, square-bonneted, pompous, making a vain parade of his Latin, and attempting to overawe his patients by long tirades of technical drivel, which only concealed his ignorance of what he supposed to be their diseases." It is not strange then that the great dramatist had no use for the medical profession, whose ridiculous side drew forth his derision in five comedies aimed at the doctors. He seems also to have had a personal prejudice against them because they could not cure his malady (tuberculosis), and because he thought that they had killed his only son with their "eternal antimony."

In "Le Malade Imaginaire" occurs the following choice bit of satire on the pompous ceremonies of medical graduation (which was accompanied and followed by several days of feasting on the part of the examiners at the expense of the candidate). The first doctor asks the question, "Why does opium produce sleep?" To which the candidate replies:

Quia est in eo
Virtus Dormitiva.
(Because there is in it a sleep-giving quality.)

which is greeted by the obligato chorus:

Bene, bene, bene, bene respondere
Dignus, dignus est intrare
In nostra docto corpore!
(Well, well, well, well answered, worthy he is worthy to enter into our learned body!)

He is then plied with various questions, and his answer to each one is greeted by the chorus, *"Bene, bene, etc."*

Molière met his death on the stage while he was playing the rôle of the hypochondriac invalid in the above comedy. During the play he had a severe coughing spell which brought on a profuse haemorrhage from which he died in half an hour.

Artemus Ward. Charles Farrar Browne (1834-1867) gained the pen name of "Artemus Ward" by publishing in the Cleveland *Plain Dealer* the very humorous and atrociously spelled "sayings of Artemus Ward." In 1860 he moved to New York and took a position on the editorial staff of *Vanity Fair.* However, he soon entered upon the lecture platform as a humorous lecturer. He developed tuberculosis in 1864. In 1866 he undertook a lecture tour in England against the advice of his phy-

sicians, and lectured almost to the time of his death in 1867. Just before his death his friend Robertson tried to get him to take a nauseous draught, and when he refused saying that he could not take the nasty stuff, Robertson urged him saying, "Come, now, you know I would do anything for you," to which Ward replied, "Then you take it."

Colonel Henry Watterson, who saw him frequently at the time Artemus Ward was lecturing in London, says of him: "I find from notes jotted down at the time, that the last I saw of him was the evening of the 21st of December, 1866. He had dined with my wife and myself, and, accompanied by Arthur Sketchley, who had dropped in after dinner, he bade good-bye and went for his nightly grind, as he called it. . . . He was too feeble to walk alone. . . . His surgeon had forbidden the use of wine or liquor of any sort. Instead he drank quantities of water, eating little, and taking no exercise at all. Nevertheless, he stuck to his lecture and contrived to keep up appearances before the crowds that flocked to hear him, and even in London his critical state of health was not suspected.

"His was one of those receptive natures which enjoy whatever is bright and sunny. . . . He poured out the wine of life in limpid stream and was possessed of rare individuality. It may be fairly said that he did much to give permanency and respectability to the style of literature of which he

was at once a brilliant illustrator and illustration."

Wright. Harold Bell Wright, painter, preacher, author, "t. b." is said to be the only novelist who ever made a million dollars from his books. "It is an ill wind that blows nobody good," and no doubt the tubercle bacilli are largely responsible for his "windfall" when they blew him from the pulpit to the press.

Wesley. John Wesley, founder of the Methodist Church, and probably the most incessant worker that has ever inhabited our globe, is another most encouraging example. At the age of fifty he suffered an acute and severe attack of tuberculosis. He said in his diary, "I caught cold and developed pain in my left chest, a violent cough, and a slow fever." And, he adds, "Dr. Fothergill told me, 'If anything does thee good it must be the country air, with rest, asses' milk, and riding daily.'" (Excellent advice, with the exception of the daily rides, according to present knowledge. This was in 1753.) His brother Charles, the great hymn writer, visited him at this time and wrote, "He is still in imminent danger, being far gone, and very suddenly, in a consumption." It is evident that Wesley did not expect to survive this severe illness, as he wrote his own very interesting epitaph, as follows:

Here lieth the Body
of
John Wesley,
A Brand plucked from the burning;
Who died of a Consumption in the Fifty-first Year
of his Age,
not leaving, after his Debts are paid,
Ten Pounds behind him:
Praying,
God be merciful to me, an unprofitable servant!

His expectations, however, were not realized. He made a good recovery and obtained a permanent arrestment of his disease, and lived to the ripe old age of eighty-eight years. It is estimated that during his fifty years of itinerant ministry he traveled 250,000 miles, preached over 40,000 sermons, and wrote more than two hundred books and pamphlets.

Mrs. "A" desires that her name be withheld, but her example is eminently worthy of record in this chapter, and I give it that others may follow suit.

"Man's inhumanity to man
Makes countless thousands mourn."

But Mrs. "A's" humanity and thoughtful kindness during her stay in the New Mexico Cottage Sanatorium made many of her fellow patients rejoice. She not only contributed many valuable books to the library, but carried them around to different

patients who were not able to go for them, and thus aroused the interest of many in good literature. She sent her victrola with a large selection of the best records to various patients to be kept for a few days, and only at rare intervals would it get back to her cottage, when new records would be tried and added to the collection, and then it would go out for another round of cheer. She sent flowers to the sickest ones, and was a source of comfort and encouragement to all. Indeed, more than one patient shed tears over her departure—a testimony of gratitude beyond the pale of words—because they felt her genuine interest in them, and because she truly fulfilled the ideal in the lines:

"Who gives himself with his alms feeds three,—
Himself, his hungering neighbor and Me."

If the reader desires further encouragement from the lives of distinguished "t. b's," he can find it in John Paul Jones, Andrew Jackson, Bichat, Keats, Stern, Heine, Thoreau, Spinoza, Raphael, Chopin, Bastien le Page, John Sterling, Henry Timrod, Alice Freeman Palmer, Anton Lang, Kerensky, Roger Babson, and many others who achieved fame and usefulness in spite of tuberculosis.

APPENDIX

WEIGHT ACCORDING TO AGE AND HEIGHT

MEN

Inches / Age	62	63	64	65	66	67	68	69	70	71	72	73	74
15-19...	116	120	124	128	132	136	140	144	148	153	158	163	168
20-24...	123	127	131	135	139	142	146	150	154	158	163	168	173
25-29...	126	130	134	138	142	146	150	154	158	163	169	175	181
30-34...	129	133	137	141	145	149	154	158	163	168	174	180	186
35-39...	132	136	140	144	148	152	157	162	167	172	178	184	190
40-44...	134	138	142	146	150	154	159	164	169	175	181	187	193
45-49...	136	140	144	148	152	156	161	166	171	177	183	190	196
50-54...	137	141	145	149	153	157	162	167	172	178	184	191	198

WOMEN

Inches / Age	60	61	62	63	64	65	66	67	68	69	70	71	72
15-19...	109	113	117	120	123	126	130	134	138	141	145	150	155
20-24...	112	116	120	123	126	129	133	137	141	145	149	153	158
25-29...	114	118	122	125	129	132	136	140	144	148	152	155	159
30-34...	117	121	125	128	132	136	140	144	148	152	155	158	160
35-39...	121	125	129	132	136	140	144	148	152	156	159	162	165
40-44...	127	129	133	136	139	143	147	151	155	159	162	166	170
45-49...	128	132	136	139	142	146	151	155	159	163	166	170	174
50-54...	130	134	138	141	144	148	152	157	162	166	170	174	178

VITAMINS

Vitamins are constituents of our food that are essential to health.

It is not necessary to buy "patent medicine" vitamins in tablet form.

A diet containing all the vitamins necessary can easily be selected from our every-day foods.

Three vitamins are known at present: A, B, and C.

A deficiency of "A" in the diet may result in symptoms of rickets.

A deficiency of "B" may result in loss of appetite and symptoms of the disease beriberi.

A deficiency in "C" may result in symptoms of scurvy.

A deficiency of any of the vitamins in the diet of children will result in impaired growth.

—Ed. Poster by Am. Med. Assoc.

APPENDIX

VITAMINS IN FOODS

Bread—	A	B	C
White (Water)...	?	*	‡
White (Milk).....	*	*	?
W. Wheat (Water)	*	**	?
W. Wheat (Milk).	**	**	?
Barley (Whole)	*	**	‡
Corn, Yellow	*	**	‡
Oats	*	**	‡
Beef Fat	*	‡	‡
Mutton Fat	*	‡	‡
Pig Kidney Fat.....	**	‡	‡
Oleomargarine	*	‡	‡
Liver	**	**	*
Kidney	**	**	*?
Brains	*	**	*?
Sweetbreads	*	**	*?
Fish, Lean	‡	*	§
Fish, Fat	*	*	§
Fish, Roe	*	**	*?
Milk, Fresh	†	**	*¶
Milk, Condensed ...	†	**	*¶
Milk, Dried (Whole)	†	**	*¶
Milk, Skimmed	*	**	*¶
Buttermilk	*	**	*¶
Cream	†	**	*¶
Cheese	**	§	§
Cottage Cheese	*	§	§
Eggs	**	*	*?
Almonds	*	*	†
Cocoanut	*	**	†
Hickory Nuts	§	**	†
Peanuts	*	**	†
Pecans	§	*	†
Walnuts	§	**	†
Tomatoes (Raw or Canned)	**	†	†

	A	B	C
Beans, Kidney	§	†	§
Beans, Navy	§	†	‡
Beans, String (Fresh)	**	**	**
Cabbage, Fresh, Raw	*	†	*?
Cabbage, Cooked ...	*	**	*?
Carrots, Fresh Raw..	**	**	**
Carrots, Cooked	**	*	*
Cauliflower	*	**	*
Celery	§	*	§
Cucumber	§	*	§
Dandelion Greens ...	**	**	*
Eggplant, Dried	§	**	§
Lettuce	*	**	†
Onions	§	**	**
Parsnip	‡?	**	§
Peas	**	**	*?
Potatoes (15 min.)..	§	**	*?
Potatoes (1 hr.).....	§	**	*?
Potatoes (Baked) ...	§	**	*
Sweet Potatoes	*	*	§
Radish	§	*	§
Rutabaga	‡?	**	†?
Spinach, Fresh	†	†	§
Spinach, Dried	†	**	§
Squash, Hubbard ...	**	§	§
Turnips	‡?	**	§
Apples	*	*	§
Bananas	*?	*?	*
Grape Juice	§	*	*
Grapefruit	§	**	**
Lemon Juice	§	**	†
Orange Juice	§	**	†
Prunes	§	*	‡
Raspberries (Fresh or Canned)	§	§	†

** Good source of the Vitamin.

* Contains the Vitamin.

‡ No appreciable amount of the Vitamin.

† Excellent source of the Vitamin.

? Doubt as to presence or relative amount.

§ Evidence lacking or insufficient.

¶ Variable.

—*Ed. Poster by Amer. Med. Assoc.*

APPENDIX

COMMON FOODS CLASSIFIED*

	Poor in Fat	Rich in Fat	Very Rich in Fat
Very high in Protein	White of Eggs Cod Fish Lean Beef Chicken Veal		
High in Proteir	Shell-fish Skim Milk Lentils Peas Beans	Most Fish Most Meats Most Fowl Whole Egg Cheese	
Moderate or Deficient in Protein	Most Vegetables Bread Potatoes Fruits Sugar	Peanuts Milk Cream Soups Most Pies Doughnuts	Fat Meats Yolk of Eggs Most Nuts Cream Butter

* This table and the following tables on food values are from "How to Live," by Drs. Fisher and Fisk, 15th edition, published by Funk and Wagnalls.

APPENDIX

TABLE OF FOOD VALUES**

NAME OF FOOD	Wgt. of 100 Calories Ounces	Per cent of		
		Protein	Fat	Carbohydrate
Vegetables				
Artichokes, as purchased, average, canned	15.	14	0	86
*Asparagus, as purchased, average, canned	19.	33	5	62
*Asparagus, as purchased, average, cooked	7.19	18	63	19
*Beans, baked, canned	2.66	21	18	61
*Beans, Lima, canned	4.44	21	4	75
*Beans, string, cooked	16.66	15	48	37
*Beets, edible portion, cooked	8.7	2	23	75
*Cabbage, edible portion	17.	20	8	72
Carrots, edible portion, average, fresh	7.6	10	8	82
Carrots, cooked	5.81	10	34	56
*Cauliflower, as purchased, average	11.	23	15	62
*Celery, edible portion, average	19.	24	5	71
Corn, sweet, cooked	3.5	13	10	77
*Cucumbers, edible portion, average	20.	18	10	72
*Egg plant, edible portion, average	12.	17	10	73
Lentils, cooked	3.15	27	1	72
*Lettuce, edible portion, average	18.	25	14	61
*Mushrooms, as purchased, average	7.6	31	8	61
*Onions, fresh, edible portion, average	7.1	13	5	82
*Onions, cooked	8.4	12	40	48
*Pasnips, edible portion, average	5.3	10	7	83
Parsnips, cooked	5.74	10	34	56
*Peas, green, canned	6.3	25	3	72
*Peas, green, cooked	3.	23	27	50
Potatoes, baked	3.05	11	1	88
*Potatoes, boiled	3.62	11	1	88
*Potatoes, mashed (creamed)	3.14	10	25	65
*Potatoes, steamed	3.57	11	1	88
*Potatoes, chips	.6	4	63	33
*Potatoes, sweet, cooked	1.7	6	9	85
*Pumpkins, edible portion, average	13.	15	4	81
Radishes, as purchased	17.	18	3	79
Rhubarb, edible portion, average	15.	10	27	63
*Spinach, cooked, as purchased	6.1	15	66	19
*Squash, edible portion, average	7.4	12	10	78
*Succotash, canned, as purchased, average	3.5	15	9	76
*Tomatoes, fresh, as purchased, average	15.	15	16	69
*Tomatoes, canned	15.2	21	7	72
*Turnips, edible portion, average	8.7	13	4	83
Vegetable oysters	9.62	10	51	39
*Apples, as purchased	7.3	3	7	90
Apples, baked	3.3	2	5	93
Apples, sauce	3.9	2	5	93
*Apricots, edible portion, average	5.92	8	0	92
Apricots, cooked	4.61	6	0	94
*Bananas, yellow, edible portion, average	3.5	5	5	90
*Blackberries, as purchased, average	5.9	9	16	75

TABLE OF FOOD VALUES—Continued

Blueberries	4.6	3	8	89
*Blueberries, canned, as purchased	5.8	4	9	87
Cantaloupe	8.6	6	0	94
*Cherries, edible portion, average	4.4	5	10	85
*Cranberries, as purchased, average	7.5	3	12	85
*Grapes, as purchased, average	4.8	5	15	80
Grapefruit	7.57	7	4	89
Grape juice	4.2	0	0	100
Gooseberries	9.2	5	0	95
*Lemons	7.57	9	14	77
Lemon juice	8.77	0	0	100
Nectarines	5.18	4	0	96
Olives, ripe	1.31	2	91	7
*Oranges, as purchased, average	9.4	6	3	91
Oranges, juice	6.62	0	0	100
*Peaches, as purchased, average	10.	7	2	91
Peaches, sauce	4.78	4	2	94
Peaches, juice	4.80	0	0	100
*Pears	5.40	4	7	89
Pears, sauce	3.98	3	4	93
*Pineapples, edible portion, average	8.	4	6	90
Raspberries, black	5.18	10	14	76
Raspberries, red	6.29	8	0	92
*Strawberries, as purchased, average	9.1	10	15	75
*Watermelon, as purchased, average	27.	6	6	88
Fruits (Dried)				
*Apples, as purchased, average	1.2	3	7	90
Apricots, as purchased, average	1.24	7	3	90
*Dates, edible portion, average	.99	2	7	91
*Dates, as purchased	1.1	2	7	91
*Figs, edible portion, average	1.1	5	0	95
*Prunes, edible portion, average	1.14	3	0	97
*Prunes, as purchased	1.35	3	0	97
*Raisins, edible portion, average	1.	3	9	88
*Raisins, as purchased	1.1	3	9	88
Cooked Meats				
†Beef, round, boiled (fat), 1099‡	1.3	40	60	00
†Beef, round, boiled (lean), 1206‡	2.2	90	10	00
†Beef, round, boiled (med.), 1188‡	1.6	60	40	00
†Beef, 5th right rib, roasted, 1538‡	.65	12	88	00
†Beef, 5th right rib, roasted, 1616‡	1.2	25	75	00
†Beef, 5th right rib, roasted, 1615‡	.88	18	82	00
†Beef, ribs, boiled, 1169‡	1.1	27	73	00
†Beef, ribs, boiled, 1170‡	.87	21	79	00
*Calves foot jelly, as purchased	4.	19	00	81
*Chicken, as purchased, canned	.96	23	77	00
*Lamb chops, boiled, edible portion, average	.96	24	76	00
*Lamb, leg, roast	1.8	40	60	00
†Mutton, leg, boiled, 1184‡	1.2	35	65	00
†Pork, ham, boiled (fat), 1174‡	.73	14	86	00
†Pork, ham, boiled, 1192‡	1.1	28	72	00
†Pork, ham, roasted (fat), 1484‡	.96	19	81	00
†Pork, ham, roasted (lean), 1511‡	1.2	33	67	00
*Turkey, as purchased, canned	.99	23	77	00
†Veal, leg, boiled, 1182‡	2.4	73	27	00

TABLE OF FOOD VALUES—Continued

Cakes, Pastry, Pudding and Desserts					
*Cake, chocolate layer, as purchased		.98	7	22	71
*Cake, gingerbread, as purchased		.96	6	23	71
*Cake, sponge, as purchased		.89	7	25	68
Custard, caramel		2.51	19	10	71
Custard, milk		4.29	26	56	18
Custard, tapioca		2.45	9	12	79
*Doughnuts, as purchased		.8	6	45	49
*Lady fingers, as purchased		.95	10	12	78
*Macaroons, as purchased		.82	6	33	61
Pie, apple, as purchased		1.3	5	32	63
*Pie, cream, as purchased		1.1	5	32	63
*Pie, custard, as purchased		1.9	9	32	59
*Pie, lemon, as purchased		1.35	6	36	58
*Pie, mince, as purchased		1.2	8	38	54
*Pie, squash, as purchased		1.9	10	42	48
Pudding, apple sago		3.02	6	3	91
Pudding, brown betty		2.	7	12	81
Pudding, cream, rice		2.65	8	13	79
Pudding, Indian meal		2.	12	25	63
Pudding, apple tapioca		2.8	1	1	98
Tapioca, cooked		3.85	1	1	98
Cereals					
*Bread, brown, as purchased, average		1.5	9	7	84
*Bread, corn (johnnycake), as purchased, avg.		1.3	12	16	72
*Bread, white, home made, as purchased		1.3	13	6	81
Corn flakes, toasted		.97	11	1	88
*Corn meal, granular, average		.96	10	5	85
*Corn meal, unbolted, edible portion, average		.92	9	11	80
*Crackers, graham, as purchased		.82	9	20	71
*Crackers, oatmeal, as purchased		.81	11	24	65
*Hominy, cooked		4.2	11	2	87
*Macaroni, average		.96	15	2	83
*Macaroni, average, cooked		3.85	14	15	71
*Oatmeal, average, boiled		5.6	18	7	75
*Popcorn, average		.86	11	11	78
*Rice, uncooked		.98	9	1	90
*Rice, boiled, average		3.1	10	1	89
*Rice, flakes		.94	8	1	91
*Rolls, Vienna, as purchased, average		1.2	12	7	81
*Shredded wheat		.94	13	4.5	82.5
*Spaghetti, average		.97	12	1	87
*Wheat flour, entire wheat, average		.96	15	5	80
*Wheat flour, graham, average		.96	15	5	80
*Wheat flour, patent roller process, family and straight grade spring wheat average		.97	12	3	85
*Zwieback		.81	9	21	70
*Butter, as purchased	.44	.5	99.5	00	
*Buttermilk, as purchased	9.7	34	12	54	
*Cheese, American, pale, as purchased	.77	25	73	2	
*Cheese, cottage, as purchased	3.12	76	8	16	
*Cheese, full cream, as purchased	.82	25	73	2	
*Cheese, Neufchatel, as purchased	1.05	22	76	2	
*Cheese, Swiss, as purchased	.8	25	74	1	

APPENDIX

TABLE OF FOOD VALUES—Continued

Dairy Products				
*Cheese, pineapple, as purchased....	.72	25	73	2
*Cream	1.7	5	86	9
*Kumyss	6.7	21	37	42
*Milk, condensed, sweetened, as purchased	1.06	10	23	67
*Milk, condensed, unsweetened (evap. cream), as purchased	2.05	24	50	26
*Milk, skimmed, as purchased.....	9.4	37	7	56
*Milk, whole, as purchased	4.9	19	52	29
*Whey, as purchased	13.	15	10	75
Sweets and Pickles				
*Catsup, tomato, as purchased, average	6.	10	3	87
*Honey, as purchased	1.05	1	0	99
*Marmalade (orange peel)	1	.5	2.5	97
*Molasses, cane	1.2	.5	0	99.5
*Olives, green, edible portion.....	1.1	1	84	15
*Olives, ripe, edible portion	1.3	2	91	7
*Pickles, mixed, as purchased.....	14.6	18	15	67
*Sugar, granulated	.86	0	0	100
*Sugar, maple	1.03	0	0	100
*Syrup, maple	1.2	0	0	100
Nuts				
*Almonds, edible portion, average....	.53	13	77	10
*Beechnuts	.52	13	79	8
*Brazil nuts, edible portion.....	.49	10	86	4
*Butternuts	.50	16	82	2
*Cocoanuts	.57	4	77	19
*Chestnuts, fresh, edible portion avg...	1.4	10	20	70
*Filberts, edible portion, average.....	.48	9	84	7
*Hickory nuts	.47	9	85	6
*Peanuts, edible portion, average.....	.62	20	63	17
*Pecans, polished, edible portion.....	.46	6	87	7
*Pine nuts (pignolias), edible portion	.56	22	74	4
*Walnuts, California, edible portion..	.48	10	83	7
Miscellaneous				
*Eggs, hen's, boiled	2.1	32	68	00
*Eggs, hen's, whites	6.4	100	0	00
*Eggs, hen's, yolks	.94	17	83	00
*Omelet	3.3	34	60	6
*Soup, beef, as purchased, average....	13	69	14	17
*Soup, bean, as purchased, average....	5.4	20	20	60
*Soup, cream of celery, as purchased, average	6.3	16	47	37
*Consomme, as purchased	29	85	00	15
*Clam chowder, as purchased.....	8.25	17	18	65

** Abstracted from A Graphic Method of Practical Dietetics, Irving Fisher, Journal of A.M.A., Vol. xlviii, pp. 1316-1324.

* Chemical Composition of American Food Materials. Atwater and Bryant. U. S. Department of Agriculture Bulletin, No. 28, office of Experiment Stations.

† Experiments on Losses in Cooking Meats (1900-03). Grindley. U. S. Department of Agriculture Bulletin, No. 141, office of Experiment Stations.

‡ Laboratory number of specimens, as per Experiments on Losses in Cooking Meat.

BOOKS FOR TUBERCULOSIS PATIENTS

BROWN, LAWRASON, M.D.
Rules for Recovery from Pulmonary Tuberculosis. *Lea & Febiger*, 1923, 217 *pp.* $1.50
This little book now in the 4th edition has been written to help patients avoid blunders which are easily made.

CABOT, R. C.
What Men Live By. *Houghton Mifflin*, 1924, 341 *pp.* $2.50.
Work, play, love, and religion are the dominant forces in man's life. Dr. Cabot analyzes these forces and shows their influences in one's life.

FISHER, IRVING, and FISK, EUGENE LYMAN
How to Live. *Funk & Wagnalls Co.*, 1919, 461 *pp.* $1.50.
The title is a good index of the contents—rules for health living based on modern science. Air, food, clothing, poisons, alcohol, tobacco, hygiene, work, play, rest and every phase of life are considered.

FRENCH, ROY L.
Home Care of Consumptives. *G. P. Putnam's Sons*, 1916, 224 *pp.* $1.50.
This book was written by a social worker from personal experience with tuberculosis. Designed especially for patients and their families.

GALBREATH, T. C.
T. B. Playing the Lone Game Consumption. *Journal of the Outdoor Life*, 1918, 74 *pp.* Paper, $.25; Cloth, $.50.
In this autobiography the author tells how he won his fight and shows how any tuberculosis patient may profit by his methods. It is a human, soul-stirring and inspiring story, one to encourage a faint-hearted patient.

HAWES, JOHN B., 2nd, M.D.
Consumption, What It Is and What To Do About It. *Small, Maynard Co.*, 1915. 107 *pp.* $1.25.
A popular book on tuberculosis by a recognized authority who treats of the nature of the disease, home and institutional treatment, marriage and consumption, tuberculosis in childhood, and a host of other topics laymen should know about.

KING, D. MACDOUGALL, M.D., M.B.
The Battle with Tuberculosis and How to Win It. *J. B. Lippincott Co.*, 1917, 258 *pp.* $2.50.
Employing the analogy of the tubercle bacillus as an attacking enemy and the patient as defender, the author conveys a vast amount of information about home and sanatorium care in very readable form.

APPENDIX

MINOR, CHARLES L., M.D.
Hints and Helps for Tuberculosis Patients. *National Tuberculosis Association,* 1921, 16 *pp.* $.10.
In compact form this invaluable little pamphlet gives the most practical and necessary information for patients or those who are caring for them.

Nostrums and Quackery. *American Medical Association,* 535 N. Dearborn St., Chicago, Ill., 1921. $2.00.
Complete exposure of patent medicines, quack, "consumption cures," etc.

POTTENGER, F.M., M.D.
Tuberculosis and How to Combat It. *C. V. Mosby Co.,* 1921. 273 *pp.* $2.00.
The book is the result of the author's experience and talks with his patients during a good many years.

Sleeping and Sitting in the Open Air. *National Tuberculosis Association,* 370 Seventh Avenue, New York City, 1917, revised 1922, 16 *pp.* Single copies, $.10.
Simple directions for making the patient comfortable while he is taking the cure.

TUBERCULOSIS DIRECTORY
Published by the National Tuberculosis Association, 1923, 126 *pp.* $1.00.
The Tuberculosis Directory lists approximately 700 tuberculosis hospitals and sanatoria in the United States. Information is given under each institution regarding date of opening, rates, class of cases admitted, names of superintendents and medical directors and methods of application.

TRUDEAU, EDWARD L., M.D.
An Autobiography. *Doubleday, Page Co.,* 1915, 322 *pp.* $4.00.
Dr. Trudeau wove into this book in simple, direct and fascinating style all of the essential incidents and experiences of his life. It is at once a history of and an inspiration to great achievement.

WEBB, GERALD B., M.D., and RYDER, CHARLES T., M.D.
Recovery Record for Use in Tuberculosis. *Paul B. Hoeber, Inc.,* 1923. 191 *pp.* $2.00.
The volume contains about 100 pages of splendid descriptive text, and in addition daily charts sufficient for two years for recording such features as temperature, pulse and general condition.

WHAT YOU SHOULD KNOW ABOUT TUBERCULOSIS
National Tuberculosis Association, 370 Seventh Avenue, New York City, revised 1922, 30 *pp.* Single copies, $.10.
A pamphlet prepared by a committee of tuberculosis specialists and containing useful facts for the tuberculous and those living with them.

APPENDIX

WILLIAMS, HELENA LORENZ
The Comeback of Christy Mathewson. *Reprinted by permission from the Survey Graphic, Dec.*, 1923, *by the National Tuberculosis Association*, 370 Seventh Avenue, New York City, 1924, 16 *pp.* Single copies, $.10.
The story of how the famous ball player is taking the cure.

WILLIAMS, LINSLY R., M.D.
Tuberculosis—Nature, Treatment and Prevention (National Health Series). *Funk & Wagnalls Co.*, 1924. 79 *pp.* $.30.
This is a comprehensive treatise on the subject suitable for tuberculosis patients and others who wish to know more about tuberculosis. The author is the Managing Director of the National Tuberculosis Association.

WITTICH, F. W., M.D.
Information for the Tuberculous. *C. V. Mosby Co.*, 1918. 150 *pp.* $1.50.
The author, a successful physician as well as a patient, has written this book primarily for laymen. It deals with the perplexing problems of rest, exercise, food, temperature, pulse, drugs, etc., that come in the routine treatment.

JOURNAL OF THE OUTDOOR LIFE
National Tuberculosis Association, 370 Seventh Avenue, New York City.
A monthly journal devoted to the interests of tuberculous patients. $2.00 per year.