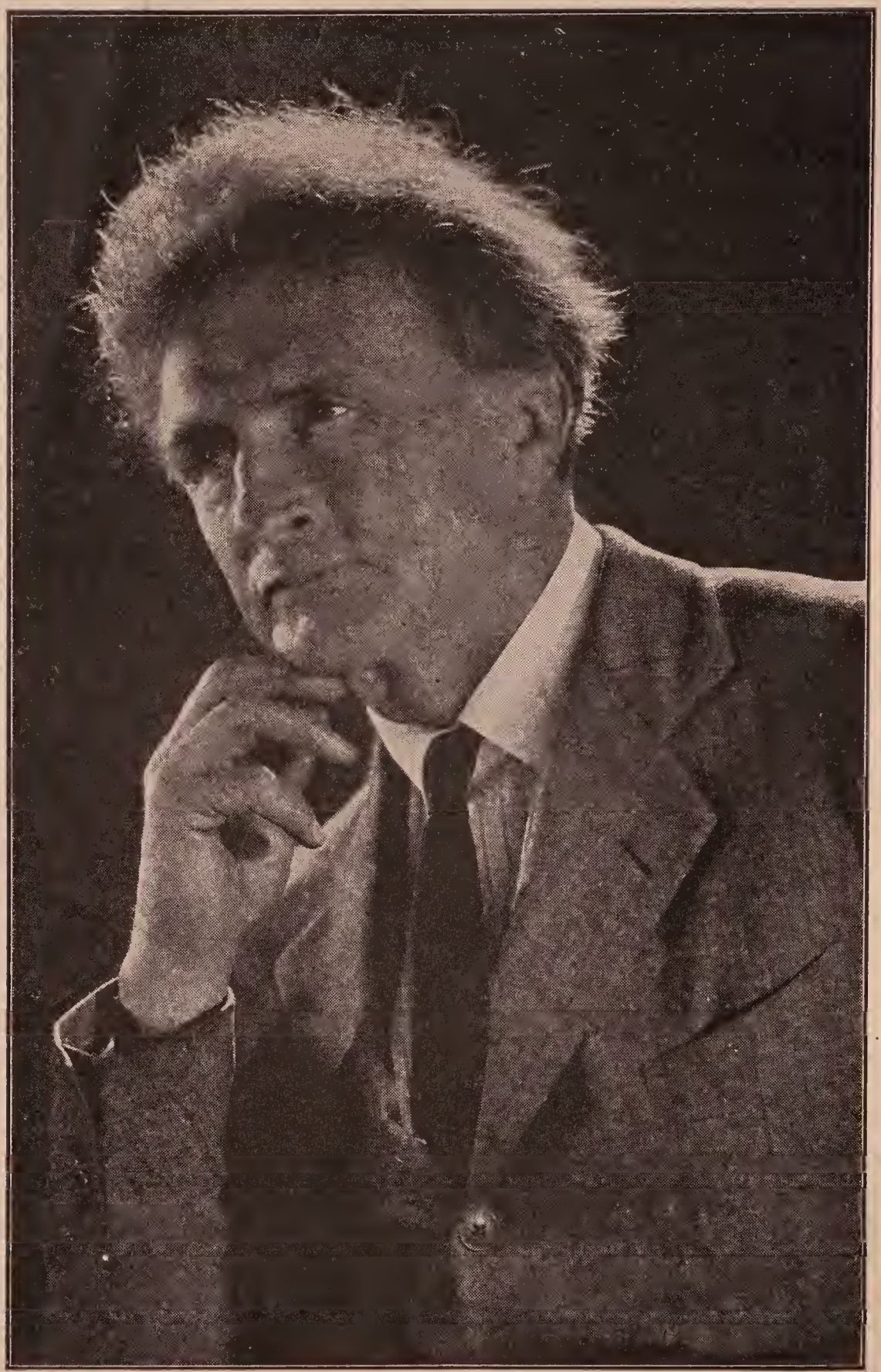
TUBERCULOSIS

Its Cause, Nature And Treatment

Charles Macfie Campbell



Portrait of the Author

TUBERCULOSIS

Its Cause, Nature and Treatment

BY

BERNARR MACFADDEN

Assisted by Staff of
Medical and Other Experts

AUTHOR OF MACFADDEN'S ENCYCLOPEDIA OF PHYSICAL CULTURE, STRENGTHENING THE NERVES, STRENGTHENING THE EYES, HAIR CULTURE, CONSTIPATION, TOOTH TROUBLES, MIRACLE OF MILK, DIABETES, HEADACHES, EATING FOR HEALTH AND STRENGTH, SKIN TROUBLES, DIGESTIVE TROUBLES AND OTHER WORKS ON HEALTH AND SEX.

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PREFACE

TUBERCULOSIS has been the Great White Plague for ages. It is now the black, red and yellow plague as well, for it affects all races. It has been known ever since man began to think about diseases, and is described in some of the first books ever written on health and lack of health. And yet in spite of the thousands of years it has existed only within comparatively recent times has a sensible and successful treatment obtained sufficient recognition to be used to any appreciable extent. And all because this disease and other diseases have been considered entities—enemy entities which must be fought—instead of friends in disguise whose warnings we should heed and thereby learn health wisdom. This imperfect conception of the true nature of disease has been one of the most important causes of the development of a great and foolish fear of tuberculosis. Another cause was the discovery of the tubercle bacillus, which gave the people something of which to be afraid, since this bacillus was given the entire blame for causing all the trouble.

Now there is no real reason for this unnecessary fear of the disease except ignorance; and it is part of the purpose of this book to dispel this ignorance so that tuberculosis will be seen in its true light and

the sufferer will be in a position to proceed confidently and hopefully with treatment and thus secure quicker and more satisfactory results.

It is high time that this was done, for tuberculosis takes an enormous toll of humanity every year. In the United States alone 100,000 die annually of this disease. And this number is only a small part of those afflicted. It is estimated that at least 500,000 are under regular treatment for tuberculosis and that at least a million are under treatment part of the time.

The greatest mortality occurs among the more primitive races, such as the blacks and the Indians after they have adopted civilized methods of living; and this, too, throws further light on causes. About nine-tenths of all cases of tuberculosis are lung cases. This should have pointed out the basis of treatment (fresh air) long ago, but it seems that humanity is often peculiarly dense mentally. The greatest mortality occurs between the ages of 15 and 35 or 40 years. However, cases among children are frequent enough, though children more often are affected in the glands, bones or joints, rather than in the lungs.

Tuberculosis was formerly considered a death warrant. No hope was held out for the unfortunate victim. In fact, less than one hundred years ago an eminent English divine proclaimed that it was blasphemous to try to cure a tuberculous patient because God himself had made the disease incurable. What a confession of ignorance! We can be thankful that the present generation, with all its short-

comings, is at least wise enough to realize that all things are possible. It has been only within the last fifty years, however, that tuberculosis has come to be considered a curable disease; and, consequently, most people still think of it as incurable, for it does take a long time to overcome inborn ideas. One reason for the present pessimistic attitude of the general public, however, is that the supposed authorities still hold out hope only for the lighter cases, giving the advanced cases the cold comfort of a promise that their lives can be at least prolonged if they do what is necessary. But I say and do proclaim in all sincerity and confidence that practically every case can be cured if the patient is sufficiently confident and persistent and uses the right methods of treatment.

So here again we come to the problem as to what treatment shall be used. The importance of prompt treatment is well realized, but it must be of the right kind. Prompt treatment of the wrong kind will be worse than none at all. Not a few people have died of treatment rather than of the disease, with which they were afflicted, and this applies particularly to tuberculosis. It has not been so long ago that such patients were shut up in closed rooms and carefully protected from all outside air, particularly during the night, with the idea of preventing any possible "exposure" to drafts, cold, and other such "terrible" conditions. A little further back patients were advised to live in a cow stable with the idea that the "emanations" would be bene-

ficial. Before this, bleeding and purging were the popular methods of treatment. One authority was quoted as saying that if anything would cure tuberculosis it would be bleeding and calomel. Another advised all tuberculous persons to "lose six ounces of blood per day for a fortnight." But most of them did not live that long. Even now there are many advertised "cures" for tuberculosis. But at least a part of the really effective treatment is so well established that there is not so much danger of the patient going wrong.

The thing to do is to use common sense. There is plenty of publicity at present on how to prevent tuberculosis, and if the people will realize that the same things which prevent will also cure they will not go far astray. Newspaper columns to the amount of half a mile every week are devoted to the subject of tuberculosis; and while all that is printed is by no means helpful there still is much that is good. If the reader will disregard the germ side of the matter and pay attention to the right habits of living which are advocated he need have no fear of the disease, and if he already has the disease he will be in a fair position to judge what is the best treatment.

Of course, sanitarium treatment is now always recommended by the orthodox doctor, but this is by no means necessary; and unless the right kind of a sanitarium is chosen—and there are very few of the right kind—more harm than good may result. If the patient stays at home, however, he

usually is under the necessity of choosing a doctor who can guide him in his efforts to recover his health or at least keep a check on his progress. Here again the average person is under a disadvantage, because there are relatively few of the right kind of doctors.

He must resort to self-education by means of books on the subject so that he can treat himself. Recovery from disease is always a matter of re-education of the patient anyhow, so books of the right kind are very necessary. The patient is sick because he has not lived rightly, and he must learn how to live before he can get well. His symptoms indicate that the body is making every effort to restore a normal condition; but unless the environment is changed it may not succeed. So education always goes hand in hand with treatment. Of course, there is always the objection that there is much disagreement in books and that what one recommends may be condemned by another. However, most of the books which advocate the wrong treatment are of little value anyhow, for they give little real information, contenting themselves with warnings to observe strict antisepsis to kill the germs and then to "follow the doctor's orders." Most of the books which advocate natural methods of treatment are fairly well agreed on the subject so that if the patient has any common sense he will get the fundamentals and be able to separate the wheat from the chaff.

However, the number of really instructive and

helpful books on tuberculosis is small; and it is with the sincere desire of being as helpful as possible that I offer this latest book on this tremendously important subject. I am recommending only those measures of prevention and treatment which have been proved of value through reason and experience. They will be found all-sufficient. It is always well to remember that it is the patient which must be treated and not the disease. When there is a choice of several measures the patient may respond to one when he will not to another. The healing forces of the body must be aroused as well as given a chance to operate; and the thing that will arouse these forces may vary in different cases. However, the fundamentals always apply. I have tried to make everything as plain as possible so that the patient will be able to select and apply his treatment without difficulty.

I bring hope to all, even to the most advanced cases, for practically no case is incurable as long as life lasts.

Bernarr Macfadden

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CHAPTER I

The Body in Health and Disease

EVERYONE should know something about his body and how it works. If this knowledge were more widespread there would be much less disease. It is especially important for the well person to understand his needs in order that he may remain well. But it is also very important for the sick person to have this information in order that he may find the road back to health. In finding the road, if he is wise, he will also have found the way to retain health when it has been secured. The sick person is under the additional necessity of knowing something about the needs of the body when it has broken down from abuse. Hence he requires an even wider knowledge than the fortunate individual in good health. There is no escaping this necessity for study. We cannot hire another to repair our bodies as we can to repair our houses and machines; we must do the work ourselves. The only assistance we can hire is a teacher who will instruct us in our work. The sooner people realize that man's greatest study is man the sooner will disease be eradicated.

The body is composed of cells and each cell is a

little "life" in itself. Some cells may function imperfectly without creating any noticeable effect upon the general health, but the effect is there just the same; and if any considerable number of cells is affected the individual will not long be left in doubt as to something being wrong.

Each cell is interested in the same functions in which the body as a whole is interested—that is, nutrition, elimination, and reproduction. The food we absorb ultimately becomes cells or is utilized by cells, and the waste products of the individual cells must ultimately be eliminated through some groups of cells known as organs, such as the kidneys, bowels, etc. Unless each cell reproduces as it should there will be degeneration and ultimate death, for the body is constantly changing and new cells must be constantly produced. The old and the new cells must be normal cells if health is to result. This continual tearing down and building up is known as metabolism.

It will readily be seen how important is food to metabolism and, hence, to the maintenance of health and the elimination of diseased conditions. But the importance of removing the waste products must not be lost sight of. Even with a perfect diet, if the elimination is not normally active a toxic condition would result. This is the underlying cause of all disease. Looking at the body as a whole, therefore, the digestive and eliminative organs are the important ones to consider in overcoming disease.

The mouth is the first part of the digestive tract,

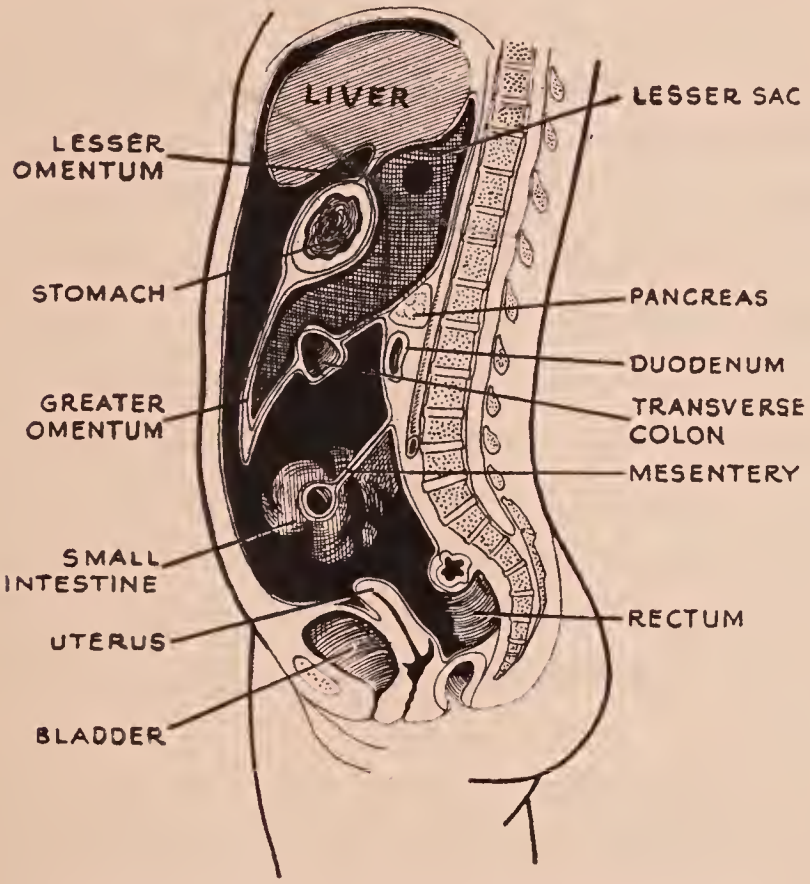
and as everybody is familiar with its appearance it will not be necessary to describe it. But two very important phases of digestion are accomplished in the mouth. These are mastication, which reduces the food to a pulp so that the digestive juices can reach all the elements, and the mixture of the food with saliva which serves the double purpose of moistening it and of changing much of the starch to sugar and the complex sugars to simpler forms. The latter function is produced by an enzyme in the saliva known as ptyalin. If this has little opportunity to act, owing to rapid eating and insufficient mastication, it will mean more work for the intestines and, hence, more cause for them to become weakened and susceptible to tuberculosis, and tuberculosis in the intestines is no picnic. The tube connecting the mouth with the stomach is known as the esophagus. It serves simply as a passageway for food and is seldom affected with tuberculosis.

The next organ is the stomach. This is a pouch-like receptacle for the food, located approximately in the center of the body just below the breast bone. The stomach is lined with mucous membrane, in which are the glands which secrete the gastric juice which contains two enzymes, pepsin and rennin, and the highly important hydrochloric acid which makes pepsin an efficient enzyme. The walls of the stomach are composed of muscles whose function it is to contract the organ with rhythmic motions so that the food is well mixed with the gastric juice. The function of the pepsin is to digest protein foods.

Contrary to the popular idea, there is not much digestion taking place in the stomach, the protein being the only element which is affected to any extent. The stomach is really more for storing the food, mixing it thoroughly, and getting it ready for the main work of digestion which takes place in the intestines. As the mouth prepares for the stomach, so the stomach prepares for the intestines. Nevertheless, the work of each is important, and if neglected or imperfectly performed it means trouble later on in the digestive tract—and in life, as well. The rennin, which is the other enzyme in the gastric juice, curdles milk. This is its sole function, but the curdling must be done before the milk can be digested. The persistence of the rennin throughout life is one proof that milk is a natural food for the adult and not a poison, as some misguided theorists claim. After the food has been thoroughly mixed by the stomach, partly digested and rendered acid in reaction by the gastric juice, it is ready to be passed on into the intestines. At this stage it is called chyme (from a Greek work for juice).

The normal chemical condition of the mouth fluid is alkaline, and the food should be alkaline when it reaches the stomach, as this stimulates the flow of the acid gastric juice. The normal state of the stomach secretions being acid, as soon as an alkali is injected there is a tendency for the stomach to secrete more acid in order to maintain the normal acidity. The acidity of the stomach contents, on passing into the intestines, stimulates the flow of

the intestinal digestive juices, since these latter are alkaline and the normal chemical condition of the intestines is alkaline. It will be seen from this that the use of chemical alkalies to overcome hyperacidity of the stomach only results in making the condition worse as the alkali stimulates the production of more acid. If the food is properly prepared in the mouth there will be little tendency toward hyperacidity of the stomach even if the diet is not all that it might be.



A cross-section of the female abdomen and pelvis. Any of the organs shown may be affected with tuberculosis but the intestine is most frequently attacked.

The intestines are the most complicated part of the digestive tract and as they are often affected with tuberculosis we will consider them in somewhat more detail. The intestine is a muscular tube about thirty feet in length, twenty-five feet of that length being the small intestine, so-called because it is only about an inch in diameter. The remaining five feet

make up the large intestine, which is not a digestive organ but an eliminative organ, and a very important one at that. The intestines are built like the stomach in that they have muscular walls and are lined with mucous membrane which (in the small intestines) contains glands. The muscles in the walls of the small intestines are chiefly arranged circularly and contract with a wave-like motion so that the food is gradually forced along the tract. In the large intestine there are more developed longitudinal muscles, which by contracting help to hold back the food so that it will not move along so rapidly and will have time to dry out to some extent, thereby producing a semisolid material for evacuation. All these muscles must be in good working order if we are to avoid constipation with its long train of ills. Constipation is a strong predisposing factor to tuberculosis, as it is to all other diseases.

As most of the digestion has to take place in the intestines three digestive juices are found there, the bile, pancreatic juice, and the intestinal juice. The bile has other functions also, the most important of which are to keep the food from decomposing in the warm, moist intestine, and to stimulate the wave-like motions of the intestine, known as peristalsis. The pancreatic juice is secreted by the pancreas. This secretion has to do the most work of all. It contains three enzymes, trypsin, amylopsin, and steapsin, which digest proteins, starches, and fats respectively. The digestion of the starches

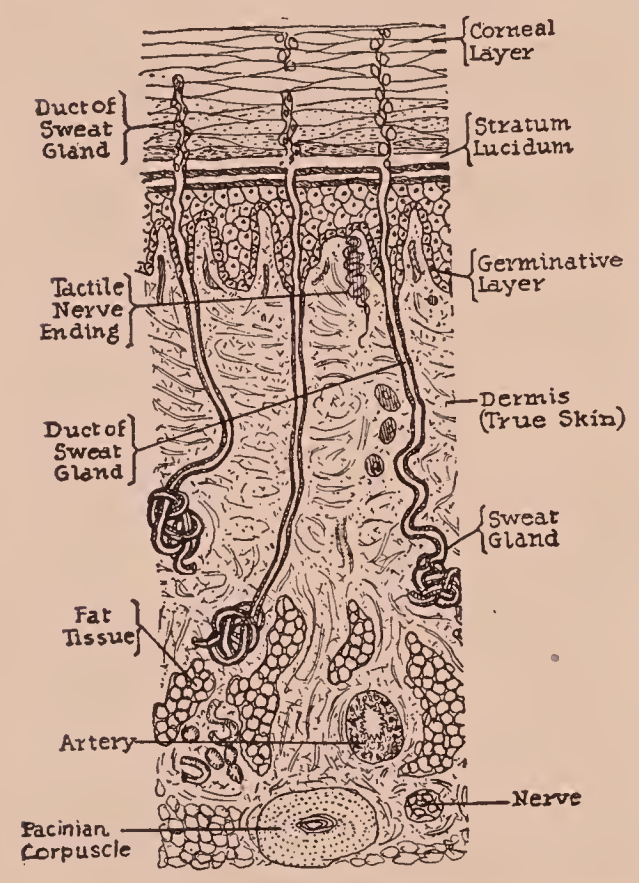
starts in the mouth and is finished in the intestines. The digestion of the proteins starts in the stomach and is finished by the pancreatic juice, assisted by the intestinal juice (succus entericus). The latter juice is secreted by glands in the walls of the intestines, and has its action mostly on the less complex protein material.

It will be noted that nothing has been said about the digestion of the mineral salts and vitamins which are receiving so much attention at present and which are without doubt even more important than the proteins, fats, and carbohydrates (starches and sugars). This is because as far as we know now they require no digestion but are directly absorbed the same as water—an extremely wise provision of Nature. These are absorbed partly from the stomach but mostly from the intestines. The other food elements are all absorbed from the intestines.

After the food elements have been removed by absorption, the residue is passed on into the large intestine where some more of the water is absorbed and the remaining solid material ejected during defecation. If this refuse is not promptly and regularly removed it soon undergoes fermentation and putrefaction, with the production of injurious gases and other toxins which will be absorbed into the blood stream and cause trouble of some kind, greater or less according to several factors.

Let us now proceed to a consideration of the eliminative organs. We have seen how food gets into the body, what happens to it and how the residue

is eliminated by one of the depurating organs—the bowels. But we also take water and air into the body and some of this must be eliminated. Then, too, there are other forms of waste material produced by muscular and organic action which must be disposed of, not to mention the many foreign articles we are continually putting into the body, such as dust, dirt, bacteria, drugs and medicines of all kinds, tea, coffee, spices, tobacco, alcohol, synthetic soft drinks, etc. All these must be thrown out of the body by the skin, kidneys, bowels, and lungs. All too often they have a tremendous amount of work to do, and while they can stand much abuse they will break down sooner or later if not given a rest. When they do break down they may become tuberculous.



A greatly magnified cross-section of the skin, showing its marvelous and complicated structure.

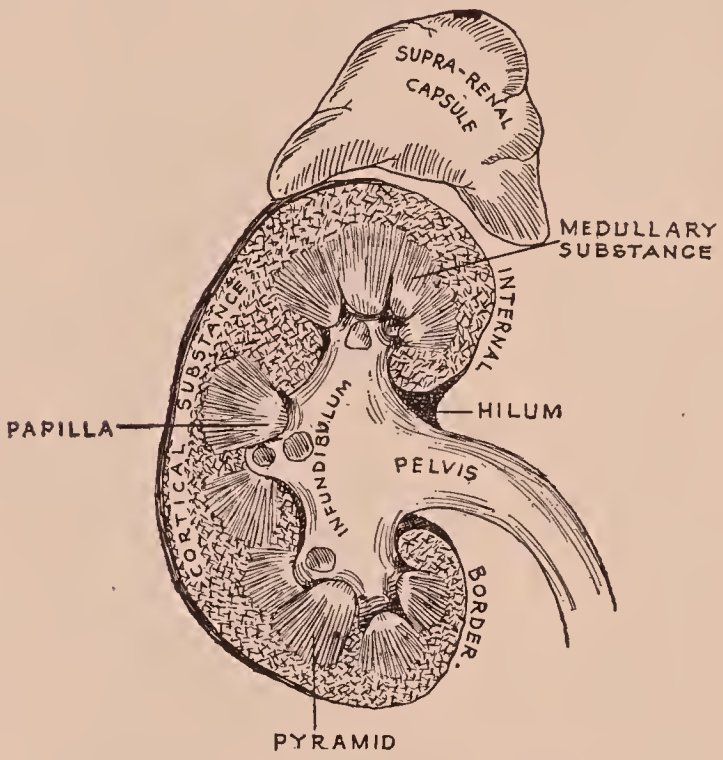
The skin has other functions to perform besides that of elimination. It is the protecting surface of the body, being composed of several layers of cells, the outer ones quite tough and resistant, yet elastic. The outer layer of the skin, whose chief function

is protective, is called the epidermis. The next layer, which contains the tiny muscles which move the skin, the blood vessels which feed it and the nerve endings of the sense of touch, as well as the oil glands, is called the derma or true skin. Underneath this is the subcutaneous layer, which is composed of connective tissue for joining the skin to the underlying tissues. It also contains fat cells and the sweat glands. The ducts of the sweat glands pass up through the derma and open onto the free surface of the epidermis. The sebaceous or oil glands also open onto the surface of the epidermis. These latter secrete an oil which serves to keep the skin soft and pliable and also acts as an additional protective agent the same as oil minimizes wear in an engine by taking up friction. The primary function of the sweat glands is to regulate the temperature of the body by producing perspiration when the body or external temperature becomes too hot. The evaporation of this perspiration causes cooling of the body. Certain waste products are eliminated in the sweat, also, and when the body is very toxic, considerable amounts of these impurities may thus be thrown off. This is why a sweat bath or the sweat resulting from exercise helps to cleanse the body. In addition to these duties the skin also breathes to a certain extent, thus assisting the lungs in their function, which will be explained later.

The skin may be affected with tuberculosis, but only if it is under the necessity of eliminating a lot of toxins so that there is plenty of food material

for the germs. Of course, if the skin is not kept clean it will be more susceptible to tuberculosis.

Closely associated with the skin in the work of elimination are the kidneys. These are two bean-shaped organs located slightly above the so-called "small of the back." The right kidney is somewhat lower than the left, but the lower edge of each is approximately two inches above the upper edges of the hip bones. The kidneys are connected by tubes called ureters with the bladder, located in the lower front of the pelvis. The bladder is connected with the outside of the body by another tube called the urethra. The kidneys themselves are composed of many tiny tubes or tubules surrounded by blood-vessels. All these tubes converge to empty into the ureters.



A cross-section of the kidney showing its various parts. This organ may be affected with tuberculosis, producing serious complications.

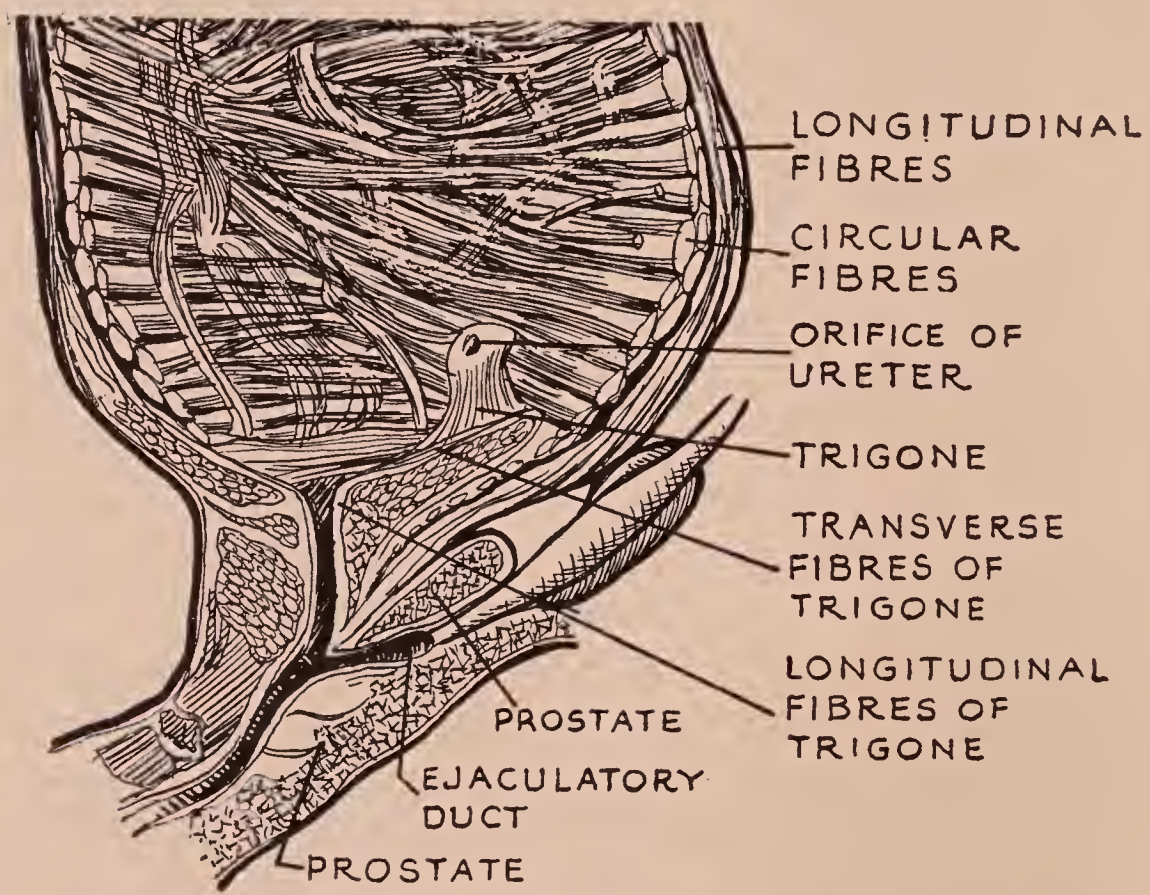
As probably everyone knows, the function of the kidneys is to secrete urine. Urine is composed largely of water, but there are also considerable

amounts of solid waste materials, most of which come from the end-products of protein digestion or from the destruction of tissue cells occasioned by the activities of the body. These waste materials are brought by the blood to the kidneys, and here they are collected in the little tubules of the kidneys through a process somewhat resembling filtration. This collection, in dilution, flows into the bladder through the ureters as rapidly as formed. It is then stored in the bladder until this is fairly full, when there will be a call to urinate and pass it out of the body. The normal amount of urine is about three pints per day, but this varies considerably with the quantity of liquids taken in the diet and the amount of perspiration.

The functions of the skin and kidneys are closely related, as the process of secreting sweat does not vary greatly in its fundamentals from that of the secretion of urine. When we perspire freely there will be less urine, but when we perspire very little there will be more urine. This is a normal relationship between kidneys and skin and their excretions. It is even more pronounced in abnormal conditions. In other words, if the skin is not normally active the kidneys will have more work to do, and *vice versa*. In fact, all the eliminative organs are thus connected. If one fails to any extent more work is thrown on the rest.

Through overwork occasioned by improper diet and the resulting necessity for eliminating an excess of solid materials, the kidneys may become irritated

or actually inflamed. When in this condition they furnish soil for the tubercle bacillus and many an unlucky patient has had his kidney removed because it was tuberculous. Not that there is any necessity for doing this, but such usually is the medical procedure. It is possible to live with only one kidney,

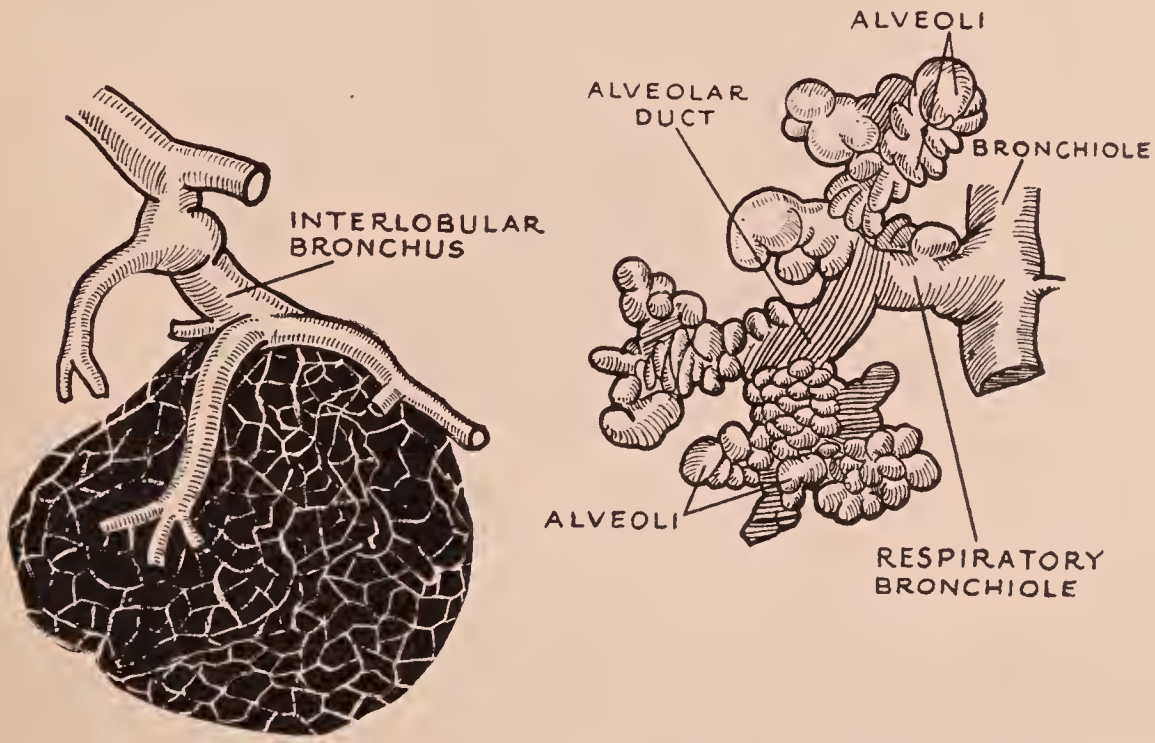


A magnified cross-section of the bladder, showing the openings for both the urethra, which goes to the kidney, and the urethra, which connects the bladder with the surface of the body. The prostate gland is also shown.

but much care will be necessary to avoid overwork and destruction of the one organ. We should keep both our kidneys as long as possible, and if given proper care they will last indefinitely.

We now come to a consideration of the lungs,

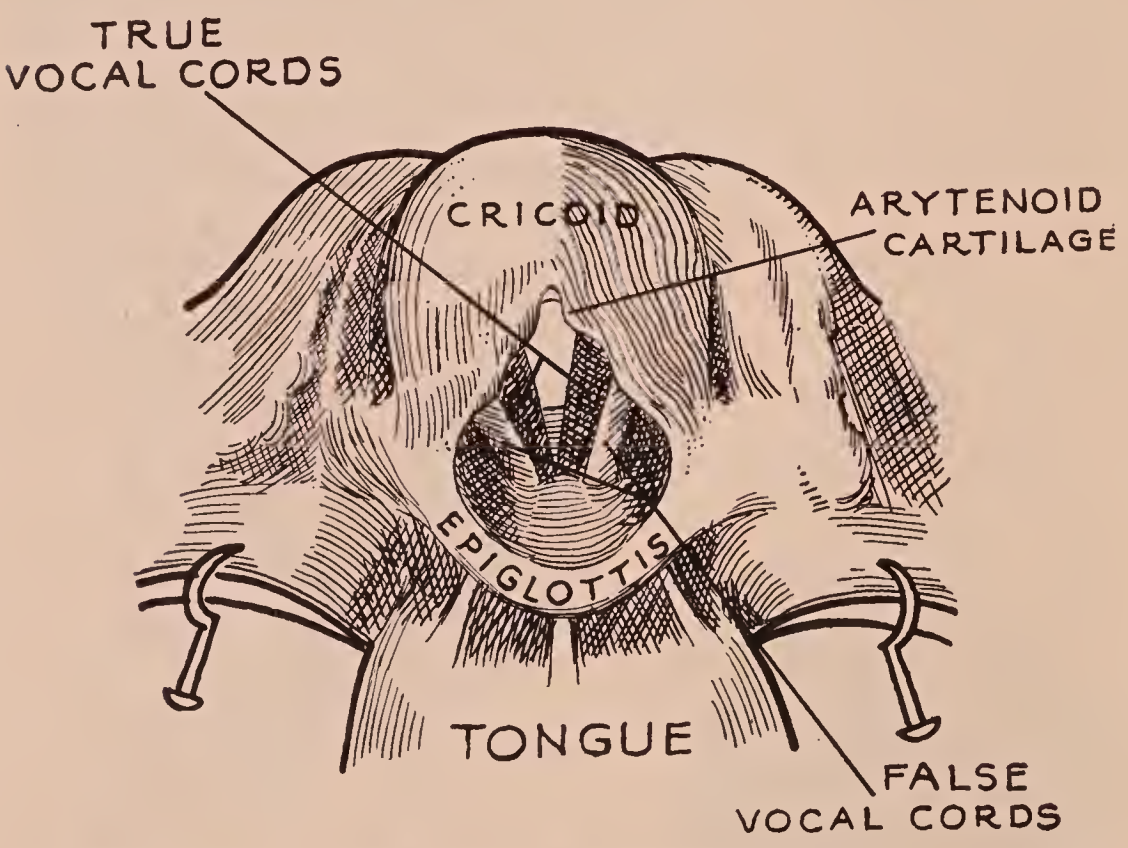
those unfortunate organs which are so often afflicted with tuberculosis. We will not consider the reason for this here but will discuss it later. For the present let us look at their structure and function, a knowledge of which will be necessary for a proper understanding of the various matters to be taken up later in this book. Every one should know about the lungs anyway, for they are vitally important, this being demonstrated by the fact that there are few things which will bring about death sooner than failure of the lungs to act. If you doubt it, try having



A magnified view of a globule of the lung and of a group of air-cells (alveoli) and their connecting ducts and bronchioles. A lobule is made up of a great number of alveoli.

someone choke you or see how long you can hold your head under water. The average person will become unconscious in about two minutes if his air supply is cut off.

The air enters the lungs through the nose, mouth, larynx and trachea, or windpipe. In a single day the lungs handle on an average of 105 barrels of air. All are familiar with the mouth and nose, but most people know little about the larynx. This is really the voice-box, as it is here that the vocal cords are located and it is through the contraction



A view of the larynx, looking down upon its top so that the vocal cords are seen. Any of the parts shown may be affected with tuberculosis, producing a very painful and serious condition.

and relaxation of these cords that sounds are produced. The larynx is a box-like structure composed chiefly of cartilage, though it has both extrinsic and intrinsic muscles attached for moving it and the vocal cords. The front cartilage is the chief one

and is called the thyroid cartilage. It is the familiar "Adam's apple." Below and behind this is the cricoid cartilage. Above the back of the cricoid and forming the back of the larynx are the two arytenoid cartilages. The top of the larynx is closed with another cartilage called the epiglottis. This is hinged and moves up and down so as to open the larynx when breathing and close it when swallowing food, as the food has to pass over the larynx on its way to the stomach. When the larynx is affected with tuberculosis it often becomes ulcerated and swollen, especially about the epiglottis and arytenoid cartilages; and this interferes greatly with swallowing and breathing, often leading to serious results. The vocal cords also may be affected, producing hoarseness or loss of voice. These cords are in two sets. The upper set is known as the false cords and the lower as the true cords. They are small ligamentous bands passing from the front to the back of the larynx with an opening between. By contracting or relaxing the cords this opening may be enlarged or closed. When closed, either naturally or because of swelling, no air can pass.

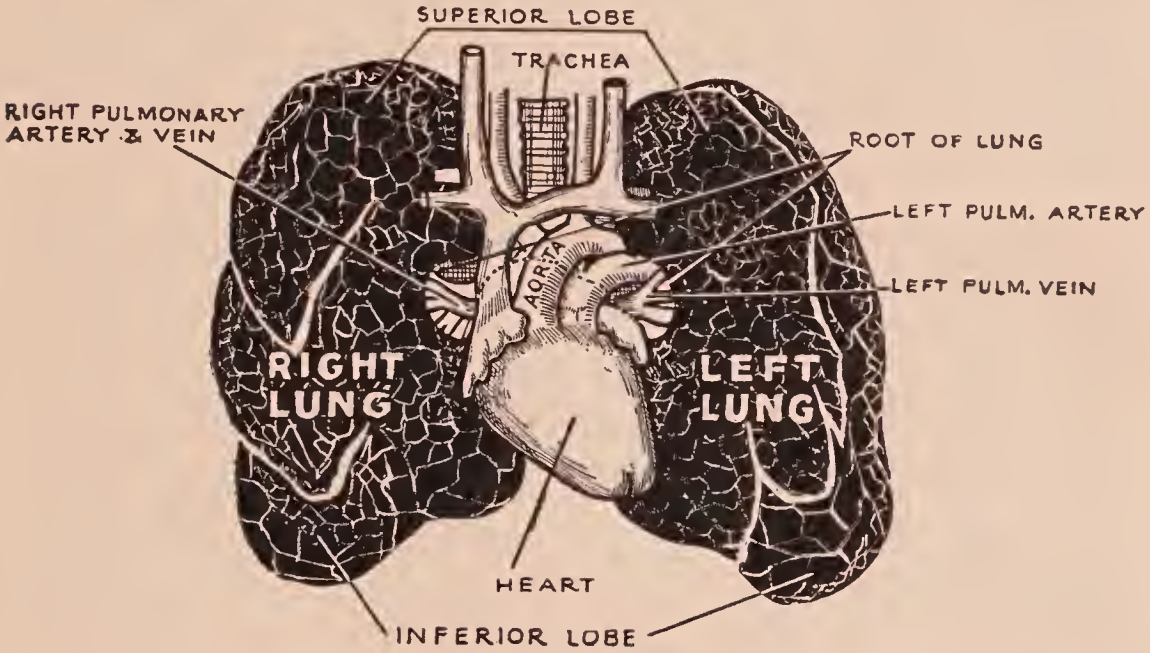
The trachea or windpipe is a tube composed of cartilage, muscle, and mucous membrane which leads from the larynx down through the chest to where it divides into two branches called the bronchi. One bronchus goes to the right lung, the other to the left lung. Each bronchus divides and subdivides, much like the branches of a tree (only inverted), so that a very large number of small tubes are formed,

called bronchioles. On the end of each bronchiole there is a membranous sac, the air-cell. It is these bronchial tubes and air-cells, together with blood vessels, nerves, and connective tissue, which make up the substance of the lungs.

The lungs are pyramidal in shape, being held in this form by the chest cavity and by a fibrous covering called the pleura. The chest cavity is lined with a similar membrane and the very small space between these two layers of pleura is filled with lubricating fluid so that the movements of the lungs will not cause friction. Each lung is partly divided into sections called lobes, the right lung having three lobes, the left lung only two lobes in order to make room for the heart, which lies between the lungs.

During breathing the lungs expand as the air enters, and contract, because of their elasticity, as the air leaves. Inspiration is a muscular effort which raises the ribs and lowers the diaphragm (the muscle forming the base of the chest cavity) so that the size of the chest cavity is increased and the air rushes in because of the difference in the inside and outside air pressures. Expiration, during quiet breathing, is simply a relaxing of the muscles so that the ribs are allowed to descend and the diaphragm to ascend, thus decreasing the size of the chest cavity and forcing the air out. It is because of these different movements that pain and various other symptoms are produced when the lungs or pleura become affected with tuberculosis, and when adhesions form as a result of this trouble.

The purpose of breathing is to bring the fresh air containing a good supply of oxygen into approximation with the blood so that it can absorb oxygen and throw off carbon dioxide, which is then breathed out during exhalation. This interchange



A view of the lungs showing the circulation to and from the heart. All the blood must pass from the heart to the lungs to be purified before it is returned to the heart to be distributed to the rest of the body

of gases takes place in the air-cells above mentioned. These cells are surrounded by many fine blood-vessels, and the membranes forming the walls in each case are so thin that the gases can pass through, but solids and liquids are held back. Thus the blood is prevented from escaping into the lungs, and the air as a whole is prevented from entering the blood-vessels, also any foreign material which may be contained in the air. Such foreign matter may remain in the air cells or bronchial tubes, however, and cause much trouble.

A plentiful supply of oxygen is extremely necessary at all times, for it is used to support metabolism, which I shall explain presently. Oxygen also enters into all the tissues so that the body would almost evaporate without it. The body is three-fourths water and water is one-third oxygen. An ample supply of oxygen at all times, not only in the lungs but in the tissues, is one of the best preventives of tuberculosis.

Now what is metabolism? It is the breaking down and building up of tissue. As the body is used, certain of the older cells in all parts wear out, die, and must be replaced. The cells use oxygen in their functions and when they die they must either be consumed (burned) by oxygen or eliminated from the body in some other manner. If they are allowed to remain they interfere with normal functions. In building up new cells, oxygen is necessary for combining with food materials to form the cells and to furnish food material for the cells. Thus you see further the importance of oxygen and why tuberculosis, through interfering with the function of the lungs, brings about such serious general symptoms as it does.

This breaking down and building up of tissues must be balanced if we are to have health. If more cells die than are replaced we will naturally deteriorate. If more cells are produced than are used up we will grow in some way. During childhood it is very important that more cells be built in order to produce growth. Metabolism is therefore more

rapid in the child than in the adult. The child becomes sick more quickly if the environment is bad, but it also gets well more quickly under the proper treatment. When a person has not been living rightly this normal interchange of tissue may be perverted in many ways and this is responsible for the many varying symptoms which we call disease, but which in reality are merely different manifestations from the same causes.

If toxins of any kind are allowed to accumulate in the body, whether their source be from the outside or from the inside, the effect is to place obstacles in the way of this building up of tissue and to produce a greater breaking down of tissue. The body could not long exist under these circumstances, and must do something about it. What we call disease, therefore, is only Nature's effort at removing these obstacles or toxins. The eliminative functions of the body are greatly accelerated and this gives rise to many symptoms such as fever or the discharge of mucus, etc., which are called abnormal. As a matter of fact, however, they are normal under the circumstances. They are abnormal only because the conditions are abnormal.

What we ordinarily call disease—and this includes tuberculosis—is therefore only a physiological process which is produced by the guiding intelligence within the body for the best interests of the body in order to clean out the excess of toxins and to warn us to discontinue the wrong habits of living which are producing the toxins. Therefore

we should look upon so-called disease as a friend. By so doing we will lose our fear of disease and thus be in a better position to profit by a correction of the habits of living. For even perfect habits will not produce perfect health if fear is allowed to inhibit and alter all the functions of the body. Of course, fear is itself a bad habit.

From the description here given you should be able to visualize fairly well the normal functioning of the organs most often affected by tuberculosis. If you will visualize all the organs functioning normally as here described, and especially any which may be diseased, it will help much to accelerate your progress toward health. More of this hereinafter. For the present, try to remember what I have told you of the different parts of the body and how they work, for it will help you much in understanding and utilizing the suggestions that will be given in the subsequent pages.

CHAPTER II

Nature of Tuberculosis

EVER since the bacillus tuberculosis was discovered by Koch in 1882 the medical doctors have claimed that this was the cause of the disease and that the nature of the symptoms was determined entirely by the type of germ and its activities. They maintain that the prevalence and destructiveness of the disease are due to the numbers and virulence of the germs. They have long laid great stress upon hunting out and exterminating the bacillus. People were so impressed with the fear of the "bugs," as they were familiarly called, that they were afraid to go within a mile of any one having tuberculosis. Often the patient's own family would desert him.

The truth of the matter is that tuberculosis is essentially a filth disease—that is, internal filth. The germs are necessary as scavengers; and if tuberculosis did not develop, something else would develop, because the body could not continue to exist when overloaded with toxins. Of course, external filth is also a factor, because it does to some extent interfere with internal cleanliness.

The disease is most prevalent among the poorer classes, especially in the cities, where the living conditions are the worst and the struggle for existence the most severe. Denatured, partly decomposed,

and artificially preserved foods are used because of their cheapness; but they produce many toxins in the body, and lower vitality through failing to fully nourish. Ventilation is very poor and sometimes wholly absent in the dwellings of these poor people, and elimination is checked.

However, rich people also are affected by tuberculosis. They may suffer just as much from malnutrition as the poor, because they are inclined to buy the fancy foods which appeal to the taste and sight but which have had the life principle removed by manufacturing processes. On the other hand, they may be overfed, and this, too, leads to toxemia. Many times they suffer nearly as much from lack of fresh air as do the poor, not because they cannot get it but because they are too lazy to go out and get it, or coddle themselves in overheated rooms or shut their windows and draw the curtains to protect their valuable furnishings from the dust and sunlight. The rich are almost always enervated from overindulgence in all the pleasures of sense. Thus they may become as lacking in vitality as may the poor. Nevertheless, though many cases occur among the rich, they are not so frequently affected as are the poor. They do have better opportunities for keeping themselves in good condition, and in the main they take advantage of them.

It will be seen from these facts that the real nature of tuberculosis is that of an eliminative crisis which is brought about by the body in its efforts to remove the accumulated toxins generated as a result

of wrong habits of living—plus starvation resulting from a deficient diet and deficient sunlight and fresh air.

This is true of both the acute and chronic forms. The chronic form perhaps can not be called a crisis; but it is an eliminative effort—retarded because of deficiency of necessary elements and of vitality. The acute form is generally a result of a rapid accumulation of toxins so that the germs find very favorable conditions for simultaneous development in all parts of the body. There is also a rapid lessening of the vitality, usually from dissipation but sometimes from other diseases, which prevents the body from eliminating as it should and from resisting the germ development as it ordinarily would. The chronic form of the disease usually follows a long period of only moderately wrong habits of living, and the accumulation of toxins is gradual. There has not been such a rapid lowering of vitality, hence the body has been continually resisting destructive influences, and many of the toxins and germs which have developed from time to time have been killed or eliminated before general symptoms developed. Finally, however, resistance is broken down and so many toxins accumulate that a more powerful eliminative effort is required. Definite general symptoms then appear.

It matters not which part of the body is affected, the nature of the disease is the same and the fundamental causes are the same. Thus all forms of the disease are related other than by the germ.

The disease may appear in more than one part of the body at the same time or at different times. The particular part of the body affected depends on which part happens to be weakest at the time. There are many factors which govern this. These will be taken up more fully when considering susceptibility in the next chapter. From the medical standpoint the part affected dpends on whether the germ is inhaled, swallowed, or enters the body in some other way. But many people imbibe considerable numbers of the germs in various ways yet never have the disease. Other people may have it who apparently have never come in contact with the bacillus, at least from an active case of tuberculosis. There is considerable reason for believing that *the germ may develop from some other form when the environment is favorable for such change.* The germ, because of its nature and the toxins given off during its life processes, may determine the symptoms to a considerable extent; but the food material on which it feeds—that is, the toxins—also determines to a considerable extent what form the germ will take. So no matter how you look at it, it is the accumulated filth in the body which determines the nature of tuberculosis.

This disease is technically called phthisis and popularly called consumption, especially when the lungs are affected. However, the most commonly employed term is tuberculosis. Tuberculosis means a disease of tubercles or the process of the formation of tubercles. The tubercle is the characteristic

lesion. Its nature is supposed to be due to the nature of the germ. Perhaps it is partly; but its characteristics are really a result of the particular reaction or the particular form of offensive presented by the body in fighting the germ and the toxins. The bacillus, of course, does have certain characteristics of its own which differentiate it from other bacteria.

The *bacillus tuberculosis* is a short, rod-shaped non-motile bacterium from 3 to 4 microns in length and beaded in appearance. It belongs to the vegetable kingdom, and reproduces itself by division. It does not grow and multiply to any appreciable extent outside the body, for it does not find the necessary nourishment; but it will remain alive and ready to develop for considerable periods of time if the environment is favorable, especially in dark, damp, dirty places. It requires dampness and darkness in its habitat. It may be killed in one hour by direct sunlight and in eight to twelve hours by diffuse sunlight. It is one of the easiest killed of all germs when not protected by the capsule, which forms around it, as described below.

The typical lesion produced by the body in its efforts to destroy the toxins and the germs is called the *tubercle*. This is a small, grayish, translucent nodule, firmly imbedded in the tissues, and is formed of the bacilli, and giant cells surrounded by a layer of spindle-shaped connective tissue cells called epithelioid cells. These are produced by the body in an effort to wall off the germ and thus prevent

it from multiplying and extending its activities. Outside the epithelioid cells is a layer of lymphoid cells, which are leucocytes or white blood cells. These are the policemen of the blood, whose business it is to kill or absorb germs and other toxins which may gain entrance to the body or which may be developed within the body. They are outside the epithelioid cells to be ready for any germs which may escape this surrounding or incapsulating wall. The germs are found chiefly in the giant cells at the center of the tubercle, and in and between the epithelioid cells; but in the later stages they are also found in the lymphoid cells. No blood vessels are formed in the tubercle, since it is not a natural part of the body. The tubercles vary considerably in size, some of them being microscopic and others quite large. The larger ones are the older ones which have been growing in spite of the body's efforts. Sometimes a number of the smaller tubercles which may be close together will coalesce and form a larger one.

The tubercle bacillus as seen under the microscope. The usual rodlike form is sometimes curved. This bacterium belongs to the vegetable kingdom and reproduces by division.

When the germ first enters or is developed within the body it starts to grow and reproduce itself, if there is food (toxins) for it; however, without food it naturally will die. If it does start to de-

velop a tubercle is formed. The bacillus, then being shut off from its food supply, will die or at least remain dormant. If, however, there is sufficient food material present for the germs to develop and multiply while the wall is forming the wall may fail to develop completely or may be broken down, with the result that the germs spread and start other tubercles. When the protecting wall is not properly formed the tubercle undergoes degeneration, a process called caseation, because a cheesy substance is formed. This process is somewhat akin to the formation of pus following an ordinary infection. If a number of tubercles coalesce and then undergo caseation a cavity may be formed. If this is near a blood-vessel the vessel walls may be involved so that a hemorrhage is produced. When the tubercle is near the surface of the body an ulcer may be formed. At any time, however, that the body develops enough resistance to build the protecting wall about the spot of inflammation, progress of the "disease" will be checked. This increase in resistance may be brought about by a correction of the habits of living; and if, at the same time, the causative toxins are removed by eliminative treatment, recovery will soon result.

The extent of the disease depends not on the number of germs with which one may come in contact, but on the amount of toxic material in the body to serve as food for the germs, and on the amount of individual vitality and resistance. Most

people have had active tuberculosis germs in their body at some time, but they have been successfully walled off and rendered impotent so that the person never knew that they were present. On the other hand, others have so little resistance and so many toxins that the disease continues to spread until very marked symptoms develop. If proper treatment is not instituted the body's efforts to cleanse itself may fail; and being then in no condition to continue living, the community life will depart and the germs will reduce the individual cells to the original elements from which they came, to be used again in building other forms of life.

Always remember, however, that the body is continually fighting to maintain its existence and if given half a chance it will do so. Healing of tuberculosis is difficult only because proper measures usually are not adopted until the disease is considerably advanced and the vitality greatly reduced. Incipient cases are readily cured, even by only partially correct treatment. However, even these cases may be difficult because people are very unready to give up their wrong habits of living until or unless death is just around the corner; and sometimes the afflicted person's environment is very unfavorable and yet very difficult to change. Recovery depends entirely upon cleansing the body of the accumulated toxins which form the soil and food for the germs, and upon increasing the vitality so that the fighting forces of the body may throw up a strong protecting wall about the germs or about

any cavities which may have been formed. In the case of a cavity in the lung, if one takes the proper care of himself, the space is gradually filled in with firm connective tissue forming a scar. Normal lung tissue will not grow again and the capacity of the lungs will be somewhat reduced on that account. But as one can live in reasonable health with only one lung or even less than one lung, there seldom is sufficient destruction of tissue but what good health can be restored.

So do not think of tuberculosis as such a terribly desperate and fatal disease, but merely as a temporary condition, necessary for the time being, but which can be removed by removing its causes.

CHAPTER III

Susceptibility to Tuberculosis

SUSCEPTIBILITY, or that particular state which renders a person liable to the development of a certain disease, is usually blamed chiefly on heredity; but the habits of living are much more responsible. Authorities are fairly well agreed that tuberculosis is not directly inherited; that is, a child born of a tuberculous mother seldom if ever has the disease at birth. Tuberculosis in the father does not seem to make any difference in this respect, either. Yet tuberculous parents should not have children, not only because of their own welfare, but because the children will not be as strong and healthy as they should be; and while it may not immediately show signs of the disease it will be more likely to develop it if the habits of living are not right. In other words, while a child does not inherit the disease it may inherit the susceptibility to it.

An inherited susceptibility consists of weakness of certain organs and what might be called organic habits, as well as mental habits. We all are products of the reactions of our ancestors to their environments as well as of our own reactions to our past and present environments. There may have been factors in the lives of our ancestors which placed a particular strain on certain organs so that they were weakened or diseased. Nature always

attempts to take care of the child, and most children are born healthy. But when these weakening influences have continued for a number of generations the children will begin to manifest an enfeeblement of the same organs that were weak in their parents. The lungs, the glands, the intestines, etc., therefore may be lacking in normal resistance and be susceptible to further abnormalities.

Then, again, these same weakening influences have called for a certain reaction from the organism, and when these reactions are repeated for generation after generation organic habits of reaction are developed. In this way some people may be inclined to acute reactions and others to chronic reactions; some may be inclined to inflammations and others to degenerations; some may be inclined to headaches and others to skin eruptions. So, some people are inclined to the production of the symptoms known as tuberculosis when their bodies become overloaded with toxins, while others may react with pneumonia, or kidney disease, or cancer, etc. The lungs most often are affected with tuberculosis, because the mucous membranes of the respiratory passages are generally the first to be called upon for extra elimination. This has been going on for generations, so that an organic habit has been developed; and most individuals during their lives give the body every opportunity to perpetuate this habit by continually creating cause for extra elimination. In this way the lungs are gradually weakened. Of course, the particular condi-

tions present at the time when a reaction of some kind becomes necessary will also determine to a large extent just what form the symptoms will take. This is where the mental habits and the germs enter the picture.

Mental habits develop the same as organic habits; in fact, organic habits are, fundamentally, mental habits. However, by mental habits I refer here to the habits of mental expression. Some people when hurt or angered will react with a violent outburst of temper, while others will react with sulks, or with suppression of the feelings so that there are no visible outward manifestations. The first named group is more inclined to the purely physical disease, while the last two are more inclined to the nervous and mental disease. Another factor which enters here is the dread of a certain disease, which may be born in people because their ancestors have dreaded it for generations or it may be impressed during childhood. Some member of the family may have had a disease, such as tuberculosis, and perhaps died of it because of improper treatment, and all the other members of the family thereby developed a dread of it and may have taught that dread to their children.

An inherited susceptibility, therefore, may be an inherited weakness of certain organs or tissues or inherited habits of mental and physical reaction, or both. None of us can wholly escape these influences, and all too often they will work out into manifestation in a person's life. They do not al-

ways do so, however, because all persons in a family that may be inclined toward tuberculosis or some other disease do not suffer from that disease. What is it, then, that perpetuates and develops this susceptibility to such an extent that the disease finally develops? Briefly, wrong habits of living.

A person who is clean internally and externally need never fear tuberculosis or any other disease. It is those persons who insist on living wrongly, so that they are filthy inside, who need to watch out for tuberculosis. I do not say they need to fear it—they should not; but they should realize that they are making themselves susceptible to it.

If you wish to know whether you are susceptible to tuberculosis do not look so much at your heredity, your age, your sex, or your chances of exposure to the germ, but at your habits of living. Do you live according to the laws of Nature, or according to your own sweet or contrary whim? Are you indulging in all sorts of destructive habits, or do you follow a regular plan of healthful living? Even a person who has a marked inherited susceptibility to tuberculosis may avoid all manifestations of the disease by right living. This is proved by the excellent results secured in caring for pretubercular children—where tuberculosis seems to threaten, but where no lesions yet have developed. Fresh air, proper food, balanced exercise and rest soon build up their vitality to the point where they are able to resist any number of germs. A high vitality is proof against any disease. While a high or a

low vitality can be inherited, the state of vitality of any individual from day to day depends chiefly upon his habits of living. A high vitality may be wasted so that disease is always imminent, while on the other hand a low vitality may be conserved so that health is constant. The low vitality can also be increased, as is proved by the many people who recover from tuberculosis.

There is every reason, therefore, to assert with confidence that the healthy person can avoid tuberculosis and the person already affected can recover if each is willing to do what is necessary. Even cases which have been given up to die by more than one doctor have lived to see those doctors placed in their graves. So in reading further in this book I want you to put ideas of susceptibility in the background, and to concentrate on learning the real causes of tuberculosis and how to avoid them and how to remove the effects of those causes if the causes have been permitted to be active.

CHAPTER IV

Causes of Tuberculosis

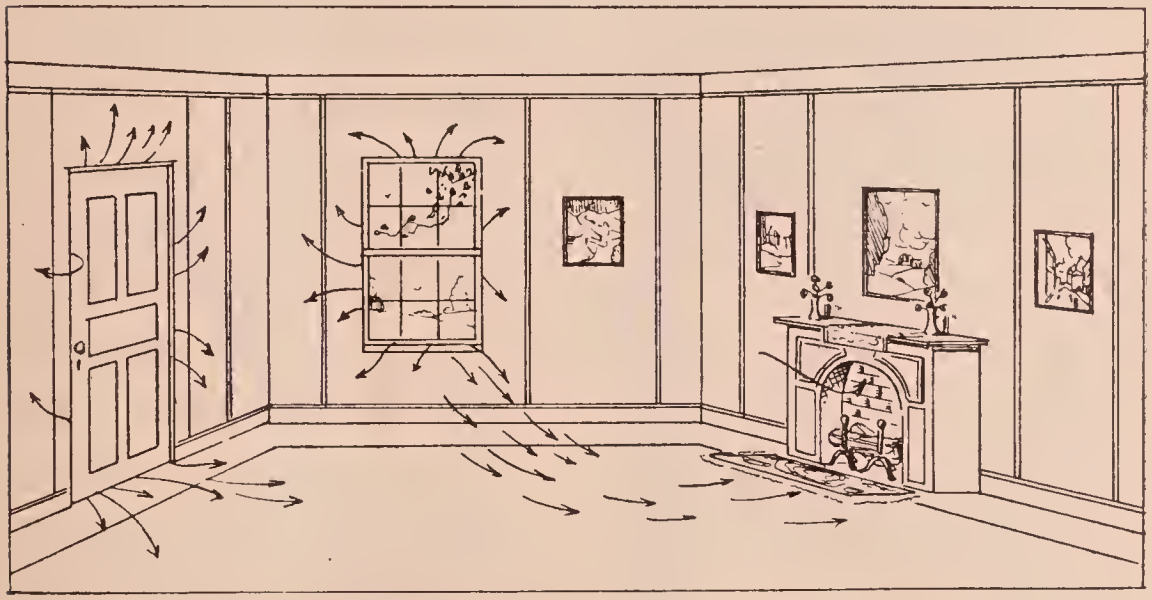
IN 1882 Dr. Robert Koch, of Germany, discovered a germ which was always present in cases of tuberculosis, and which produced tuberculosis or tubercles when injected into animals along with food for the germs in the form of the germ culture. This he called the *tubercle bacillus;* and ever since all the medical men and books have stated that the cause of tuberculosis is this bacillus of Koch. They have eulogized the man and anathematized the germ. For a long time they bent all their energies toward killing the germ and tried all kinds of medicines and antitoxins for this purpose, all of which failed. Finally they had to admit that the germ is causative only when the soil is favorable. Hence, we do not need to be afraid of the germ, but should concentrate on keeping free from "soil." As long as the doctors bent all their energies toward killing the germ they failed to cure the disease; but when they began to concentrate on building up the vitality through natural methods of treatment, *letting the body take care of the germs,* they began to be more successful. Now, while they still cling to various nefarious practises, they at least use fresh air and sunlight.

The real cause of tuberculosis, therefore, is not the tubercle bacillus, but anything which reduces

the vitality or creates "soil." But what is "soil"? Chiefly, by-products of normal and abnormal metabolism and digestion; but, also, poisons introduced directly into the body in the form of tea, coffee, tobacco, alcohol, drugs, serums, vaccines, etc. Tissues which are low in resistance and, therefore, abnormal to some extent in composition and function are soil also for the germs. All this soil is created through wrong habits of living. By this I mean not especially robbery, murder, drunkenness, drug addiction, and dissipation, which most people think of as wrong habits of living; but also improper diet, lack of exercise, poor posture, wrong thinking, and many such things which the ordinary person never thinks of as habits at all, wrong or otherwise. As a matter of fact, these bad habits are more likely to produce tuberculosis than the ones first mentioned, because they lower the vitality and produce toxins slowly and insidiously so that the patient hardly realizes his condition. Then, too, these bad habits are much more prevalent; hence they cause a greater number of cases. Do not think of wrong habits of living as including only the well known "sins"; but as anything which interferes with the normal functions of the body, if it be no more than failing to respond to the call of Nature to evacuate the bowels or bladder. There is only one way to live and that is the right way; halfway measures are seldom sufficient.

Nothing is more likely to cause tuberculosis than lack of fresh air, yet this same lack may not be suffi-

cient in itself always to produce the disease. It generally requires a combination of causes; but lack of fresh air will undermine the entire organism so that other causes have a more powerful effect. A full supply of pure air is absolutely necessary to the purification of the blood stream and the main-

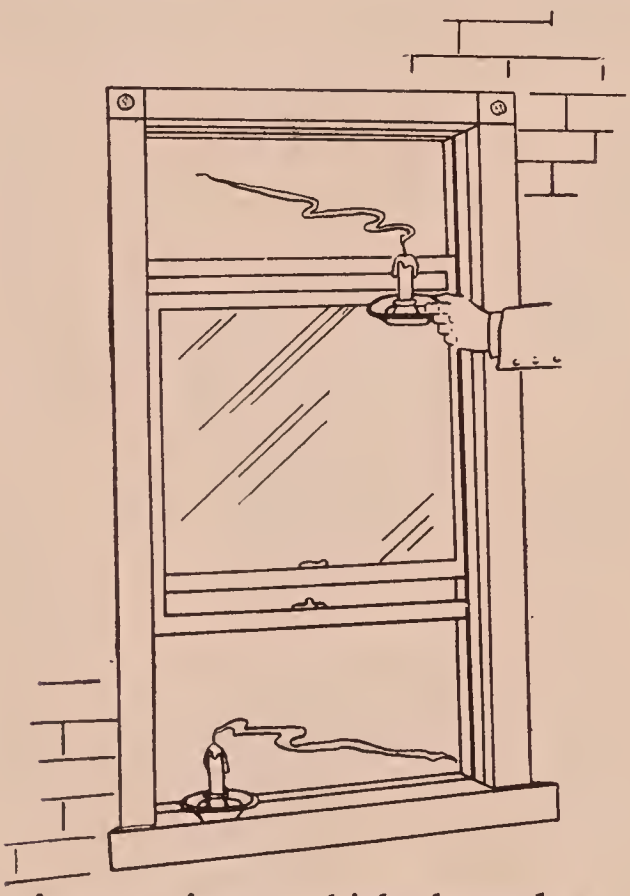


Showing the circulation of air in a closed room where there is a fireplace. A fireplace is a valuable adjunct to a room but one should not depend entirely upon it. The window should be opened so as to get the maximum of fresh air.

tenance of nervous energy, the two things upon which health chiefly depends. Pure air is necessary because any impurities of a solid nature, such as dust, lint, etc., will clog the respiratory passages and interfere with breathing, while impurities of a gaseous nature will enter the blood stream and poison it in spite of the purifying effect of the oxygen.

Oxygen is to us the most necessary part of the air, for it is the most essential food of which we

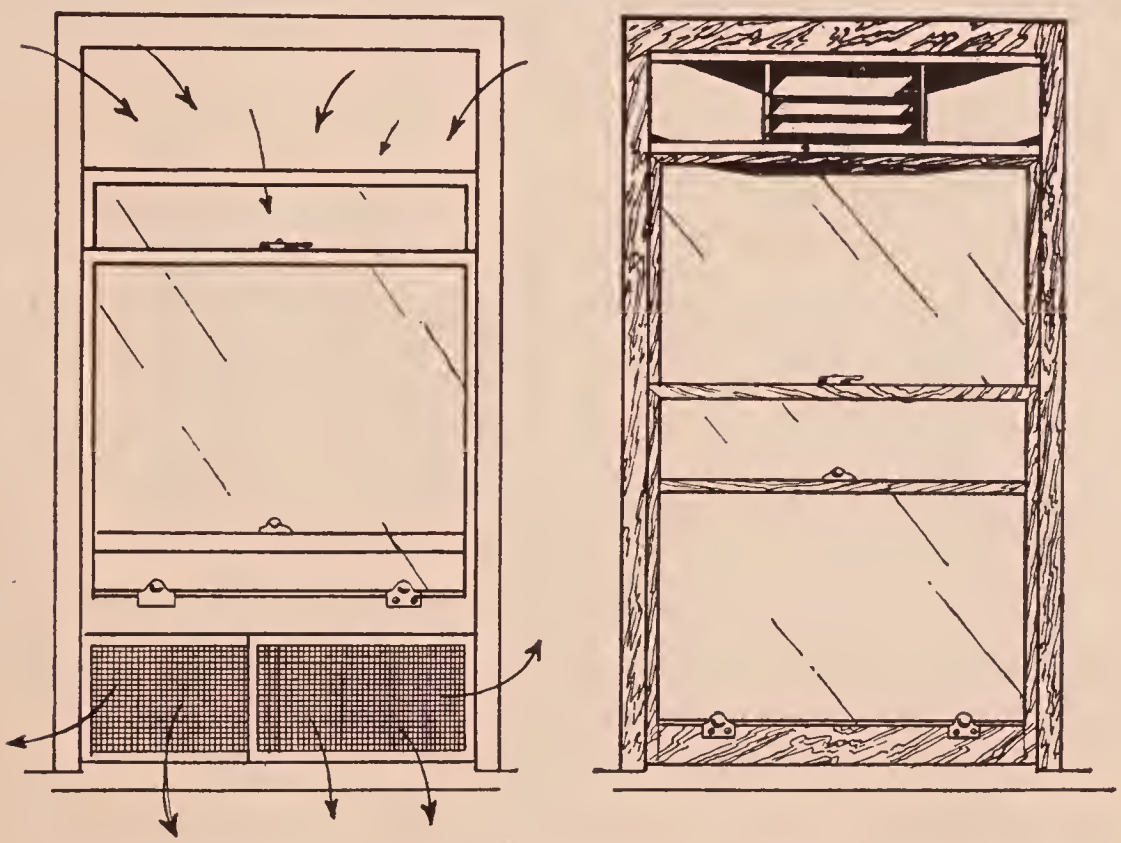
partake.. When we breathe in it is taken up by the hemoglobin in the red corpuscles of the blood and is carried to all parts of the body to be used for building tissue and destroying waste matter. The destruction of waste is accomplished by a process of combustion similar to burning, and this produces heat, thereby helping to keep the body warm. Therefore, good air in abundance is necessary to the support of bodily heat. In fact, there is not a single function of the body which does not depend, to a large extent, upon oxygen. It is equally necessary, however, that carbon dioxide—which is produced by combustion of tissue or waste material in the body—be eliminated, and this is accomplished when we breathe out. Inhalation is for the purpose of drawing in oxygen, while exhalation throws off the carbon dioxide and other waste products. Thus we are constantly polluting the air; and unless there is a free circulation of it,



An experiment which shows how the warm impure air goes out the top of a window and the fresh cool air comes in at the bottom when the sashes are open both top and bottom.

too large a proportion of the carbonic acid gas will soon accumulate. If the air we breathe is already impure this added pollution will soon render it wholly unfit for use, and if circumstances are sufficiently extreme we may smother to death.

Unfortunately, we are constantly becoming more



Illustrating two styles of window ventilators and the direction in which the air passes. In the window on the left a second ventilator could be employed at the top in bad weather. As operated, the window is lowered at the top, permitting the warm inside air to go out of the room, whereas the ventilator at the bottom permits the cool outside air to come in.

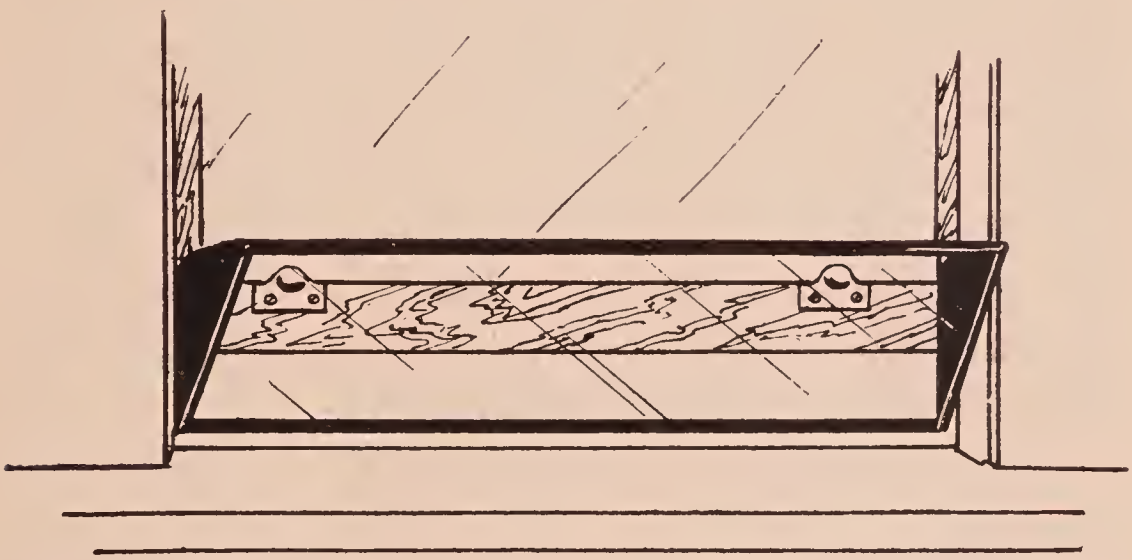
and more indoor animals. We live indoors, work indoors, and frequently play indoors. Especially in the wintertime are people prone to avoid going out except when very necessary; and even then they will frequently go "out" in a closed car which is arti-

ficially heated. The old-fashioned red flannel underwear is completely out of date. Most people in winter months usually are in some artificially closed and heated space. We are becoming hothouse plants. All this greatly increases the susceptibility to tuberculosis through lowering bodily resistance. If it were not for the improved systems of ventilation and the improvements in sanitation this indoor living would be even more serious than it is. But people who are out of doors a great deal may develop tuberculosis if they do not breathe deeply. It is not only necessary to be in the fresh air but to get the fresh air into you. Those who work at sedentary occupations soon develop the habit of breathing very shallowly. And sometimes they unconsciously may stop breathing for many seconds. This is followed by sighing and yawning —Nature's method of making up for the previous lack of air.

From a consideration of these factors you can see how easy it is to suffer from a lack of air almost without knowing it. And even if plenty of air is secured it may not be pure air, because of the many sources of contamination, such as smoke and other gases from chimneys, automobile exhausts, etc. Life under modern conditions requires a high resistance. But if due attention is given to right living in every respect this can be attained and tuberculosis avoided.

The next most likely cause of tuberculosis is improper diet. We hear much of diet nowadays, and

all sorts of information is broadcast as to what one should and should not eat. Many people become greatly confused and are afraid to eat many wholesome foods, with the result that they produce just as bad effects as though they ate everything, good and bad. This is not necessary, as a little common sense will enable one to adapt the fundamental rules of diet to his own case.



Another style of window ventilator which is fairly satisfactory. The chief drawback is the small opening available. This style is best suited to a room having many windows.

The following dietetic errors are most likely to cause tuberculosis: First, the use of "refined," denatured, and imitation foods, such as white flour and its products, polished rice, degerminated corn meal, refined sugar and syrups, dried fruits which have been sulphured, overcooked vegetables, smoked or pickled foods, spices and condiments, tea and coffee—all of which lead to malnutrition or toxemia, or, usually, both. Only natural foods in as nearly as possible their natural state should be

employed. Second, overeating, regardless of good or bad qualities. Third, eating when not hungry. Fourth, eating when worried or otherwise emotionally disturbed or when very tired—when digestion is certain to be imperfect. Fifth, insufficient mastication. Sixth, the use of complicated dishes or menus, which make digestion very difficult. Seventh, eating an excess of starches, sugars or proteins. I mention these because they are the elements of which most people are inclined to overeat, and not because they have any specific action in producing tuberculosis or that they should be entirely avoided by all tuberculous patients. However, whatever produces marked putrefaction or fermentation in the intestines favors the development and aggravation of tuberculosis.

Lack of exercise is another possible cause of tuberculosis. Exercise is very necessary for active circulation and elimination, and if it is not secured, the blood is inclined to stagnate, especially in the lungs, and there will be an accumulation of toxins to furnish food for germs. When regular exercise is not used there is no demand for strength, vitality, and resistance; and, consequently, these powers decline, for Nature is far too economical to supply anything for which there is no demand. Lack of exercise also leads to shallow breathing, for there is not the demand for oxygen and we soon get out of the habit of breathing deeply to supply it. Oxygen is best absorbed and most completely utilized when there is a strong demand for it, cre-

ated by active exercise. I have already explained how lack of air leads to tuberculosis. Lack of exercise goes hand in hand with it. One may be doing considerable muscular work and still not be getting sufficient exercise, especially for the abdominal muscles. Work does not fully take the place of exercise, because work movements usually are limited in extent. For the best psychological results it is necessary that the movements be free and carried to the limit of motion of the joints. Many people think that if they do muscular work they do not need exercise. But many a blacksmith has developed tuberculosis. Of course, I grant you that in such a case other factors necessarily would be present; but a little judicious exercise would have been very helpful in warding off the disease.

But how about too much exercise? Is it not possible to reduce the vitality in this way and so lead to tuberculosis? Of course it is; but practically no one ever does it. Most people have to be driven to exercise by their urgent need of it. A few overenthusiastic converts to the cause of Physical Culture may overexercise for a time, but they usually soon discover their mistake before any damage is done. There is far more danger of too little than too much exercise. The bad results sometimes noticed when working long hours or doing considerable exercise are usually a result of lack of sleep, worry, improper diet, or some other factor. This is proved by the fact that a reduction in the amount of work or exercise fails to produce complete re-

sults, but when more sleep is secured and the other habits of living are corrected the person feels better and is usually able to do as much or more than he was doing.

Rest and sleep are necessary, not only to balance exercise but to give the body an opportunity to recuperate in every part. Lack of rest and sleep very quickly will reduce the vitality and resistance. All during the day we are using up energy and tissue and the body has little opportunity to make up the loss as long as we are active. Complete relaxation is nearly as good as sleep for repairing and rebuilding of tissue, but not so good for the recuperation of nervous energy. So both are necessary if we would avoid that tired-out feeling which is often a forerunner of tuberculosis. Most people easily can judge for themselves when they are not getting sufficient sleep. But sometimes it is possible to accustom the body to going without a certain amount of rest so that no immediate symptoms are felt; but there is a gradual reduction in vitality which is particularly dangerous because it is unnoticed. It is well, therefore, to secure the regulation eight hours of sleep fairly constantly. In any case, never make the mistake of thinking that you can burn the midnight oil for an indefinite period and not have to pay the piper. We often find tuberculosis developing after a long period of special work, mental strain, or other factors involving a loss of sleep.

I have already said that tuberculosis is chiefly

due to internal filth. But external uncleanliness may also be a factor. However, the bad effects of insufficient bathing in adding to the probability of the development of tuberculosis arises not so much from the resulting uncleanliness as from lack of skin activity. Of course, dirt interferes with skin activity, but so does clothing. Civilized people wear clothing so much that the skin seldom if ever gets the stimulation of the air, sunshine, and friction of external objects which is common in a state of nature. Thus the skin becomes inactive unless special measures are taken to see that it has an opportunity to work freely. But few people take air, sun, or friction baths; and it is not to be wondered at that their skins are sluggish in action and clogged with waste material from inside the body so that further elimination is seriously restricted.

Lack of sunshine on the skin is a prominent cause of tuberculosis. When the heat and light of the sun are lacking, elimination in the form of perspiration is much reduced. More energy is required to metabolize food products for the maintenance of body heat because not enough heat is secured from the sun. The food itself cannot be so well utilized by the body, as the sun produces vitamins in foods, which are necessary to metabolism. The antiseptic action of the sunlight is lost, and it is a rather serious loss. I have already told you how sunlight kills tuberculosis germs. Dr. Saleeby, in his book "Sunlight and Health," says that a properly aired and lighted skin becomes

immune to acne and incapable of being vaccinated. The sun is our chief source of nervous energy; but it must reach the skin for best results. Lack of sunlight, therefore, decreases resistance and favors the production of "soil," so that the tubercular germs are given opportunity to come and set up housekeeping.

Shutting off the air from the skin by continually wearing clothing may predispose to tuberculosis the same as may lack of air in the lungs, for the skin breathes to a certain extent like the lungs. Most people do not realize how their skin is suffering for lack of air until they take air baths for a time. Then they feel so much better that they realize what they have been missing.

Another source of skin stimulation missed by many people is cold water. The exclusive use of hot water for bathing leads to anemia of the skin and of the blood and to lack of resistance to changes of temperature as well as other viscissitudes in the environment. Too many hot baths may seriously weaken the entire organism so that it becomes very susceptible to any wasting disease, such as tuberculosis. Cold water toughens and hardens the skin, stimulates the production of nervous energy, and builds reactive power, generally rendering the body more resistive to all diseases. Omission or insufficient use of cold water, therefore, may be quite a prominent cause of tuberculosis.

Another factor which must be considered is the posture. If one allows the shoulders to droop the

chest immediately is constricted and free breathing is impossible. Even the inclination to breathe deeply is destroyed. You can readily see how this might be a cause of tuberculosis when you remember what I have said of the importance of fresh air and deep breathing. Drooping shoulders also produce abnormal pressure on the abdominal organs, interfering with digestion, assimilation, and bowel evacuation. There is always a history of an interference with these functions in every case of tuberculosis. There is also the mental effect of improper posture to consider. Carelessness in this respect leads to lack of confidence, courage, determination, and initiative. It renders one susceptible to worry, fear, and all negative thoughts and influences. These things soon interfere with every function of the body.

I wish to emphasize especially the effect of wrong thinking in producing tuberculosis. Fear is the basis of practically all destructive emotions, such as worry, anger, jealousy, hate, etc. These are called destructive emotions because they actually destroy health and happiness. They produce poisons in the body, waste nervous energy, give rise to tension, and greatly interfere with every function of the body, perhaps especially digestion and assimilation. This means starvation in the midst of plenty; and starvation means susceptibility to disease, especially tuberculosis. Fear of the disease is very likely to bring it into manifestation. When we fear a thing we think of it quite constantly or frequently; we picture our-

selves as being attacked by or afflicted with the thing feared; and thus we open our minds to all the influences which tend to bring about the disease.

If you continually think of tuberculosis you will create in the subconscious mind a model of yourself suffering with the disease. This will be worked out into manifestation in accordance with mental laws, especially since fear also inhibits all the functions of the body, and thus prepares the soil by producing enervation and toxemia. Many a person who feels that he has always lived right in a physical way and cannot understand why he should have developed tuberculosis will find the answer if he will investigate his habits of thinking. It is really amazing to compare with our positive thoughts the number of negative thoughts we think in a day. It reminds one of the well known comparison of the mountain and the mole hill, positive thoughts being the insignificant mole hill. Another way of looking at this matter is that one cannot think rightly and live wrongly—he cannot think rightly in every respect and live wrongly in any respect—because thought always precedes action. If the truth were known or measureable, I believe wrong thinking would rank as a cause of tuberculosis fully as high as the M. D.'s like to place the tubercle bacillus.

It is really wrong habits of cooking which give rise to the use of tobacco, alcohol, drugs, tea, coffee, and similar poisons, all of which create soil for tuberculosis germs. A young man thinks he has to

smoke because the other fellows do; and a young woman may think she has to smoke to be smart and modern. In time they become addicted to this habit and think they have to smoke to live, whereas every indulgence leads them farther on the road to physical ill health. The use of tobacco naturally affects the lungs very quickly and renders one particularly liable to respiratory diseases. The lungs were meant to accommodate fresh air and not smoke, which is proved by the fact that choking results when smoke is introduced, at least until the body learns to put up with it through habitual abuse. Even then an unusual amount will give rise to choking. The habitual smoker will complain loudly if subjected to smoke from a furnace, an engine, or an automobile exhaust; yet he never stops to think that his tobacco smoke is equally harmful to him and equally objectionable to other people. Tobacco is supposed to kill germs, and many medical doctors condone its use by tuberculous patients for this reason. Perhaps it does kill germs; but if it does it will most certainly also kill the body cells and thus prevent recovery from tuberculosis and ultimately bring about the death of the patient. All too often doctors who know better will permit the use of tobacco because they themselves do not wish to give up smoking and have no way of justifying their use of it to their patients.

The bad effects of alcohol are too well known to need discussion. Statistics prove that persons who use alcohol are especially liable to tuberculosis.

It is a prominent cause because it poisons and degenerates the entire body. Drugs and medicines of all kinds, including tea and coffee, which are really drugs, predispose to tuberculosis in the same way, but in varying degree. Laxatives, when long continued, are especially liable to weaken the digestion and assimilation; and interference with these functions prevents proper nutrition of the body. Undernutrition is notoriously present in practically all cases of tuberculosis. Tea and coffee are especially harmful because the bad effects are not immediately apparent and many people weaken their resistance without realizing it. They develop some chronic disease and then wonder how it happened. While it may be possible for some people to use the poisons mentioned in this paragraph for a considerable period of time without apparent ill effects, the results are there just the same and will appear when least expected. You cannot cheat Nature and get away with it—remember that.

While I am on the subject of drugs I must mention vaccination and inoculation. These are a curse of modern life, particularly since they are so often compulsory or nearly so. Nothing will predispose more quickly to tuberculosis than vaccination for smallpox. Introduction of a poison directly into the body without passing through the digestive tract, as is done in vaccination and inoculation, robs the body of the opportunity to protect itself and calls for unusual forms of elimination. Many cases of tuberculosis have traced the first failure of their

health to vaccination or inoculation of some kind. They may not have had any acute symptoms (usually it would have been better if they had); but their health gradually failed, their resistance lowered, they lost weight and developed a cough, and on consulting a doctor tuberculosis was found. Does the doctor say it came from vaccination? By no means. The tubercle bacillus is to blame! But any one who will study both sides of the vaccination question and especially the history of tuberculous patients, will know which is the truth. I really should have placed this matter nearer the top of the list in considering the causes of tuberculosis, since it holds such a prominent position among all causes.

Vaccination is supposed to prevent disease, but it never does. Inoculation is done sometimes for prevention and sometimes for cure; but it never does either. When given for cure it may sometimes produce a cessation of symptoms. But this is suppression, not cure. The suppression of acute disease, especially colds, "flu," pneumonia, bronchitis, typhoid, etc., by medicines or inoculations is often a cause of tuberculosis. Many patients will tell you that their tuberculosis followed a severe cold or an attack of "flu." As a matter of fact it was not these diseases which produced the trouble, but the treatment which was used to suppress them. Suppression does not remove toxins; and as long as these remain there is bound to be further trouble. Chronic conditions, like asthma, diabetes, syphilis,

and cirrhosis of the liver, may also be followed by tuberculosis. But here again it is the causes of these conditions and the treatment used which are chiefly responsible for the lung disease. Whenever there is a chronic condition, such as those mentioned, there always is a considerable reduction in the vitality, and under such circumstances the person is very open to "infection" by germs.

Finally, as cause of tuberculosis we have the influence of what is usually called environment. This includes general living conditions, occupation, climate, etc. I have called attention to the bad effects of indoor life, poor housing, overcrowding, lack of sanitation, and poverty. Many people are in occupations which may help to cause tuberculosis by subjecting them to irritating vapors, impure air and close confinement. I do not say that such occupations in themselves will produce tuberculosis; but they create such an unfavorable environment as to render it more likely to develop. If the worker lives rightly in every respect it should be possible for him to continue his occupation without harm.

Climate has really little to do with causing tuberculosis, but it is more difficult to avoid this disease in a warm damp climate. In such a climate one is inclined to become enervated, elimination is retarded, and sanitation is more difficult. Germs thrive in such an environment. Nevertheless, tuberculosis is not confined to those parts of the world having such a climate, nor does every one in such a climate have the disease. There must be other

causes present before climate will become a factor.

In most chronic cases of tuberculosis there is no particular exciting cause unless the germ should be so considered. There is usually a gradual reduction in the vitality and a gradual increase in the amount of toxins, until inflammation results; and then, if the germ is contracted or develops, the characteristic symptoms of tuberculosis appear. In acute tuberculosis, however, the symptoms usually manifest after a period of unusual mental or physical strain, after a severe acute disease not properly treated, or after particularly abandoned dissipation, or following exposure to unusual extremes of weather. The exciting causes, however, are of little importance, as it is the habits of living and environment which really make the disease necessary and which prepare the "soil" for the germs.

When we consider how most people live, and how many opportunities there are in civilized life for reducing vitality and interfering with function, the wonder is that there is not more tuberculosis. We learn from the great number who escape tuberculosis how the body always does its best to keep normal, how kind and forgiving Nature is even though we sometimes may think her harsh, and how persistent is Life. We learn also that, since these things are so, recovery from tuberculosis is easily possible if one will give Nature a chance. It should especially teach us the importance of prevention by right living, for it is always easier to prevent than to cure.

CHAPTER V

Symptoms of Tuberculosis

THE characteristic lesion in cases of tuberculosis is the tubercle. This was described in the chapter on "Nature of Tuberculosis." The tubercle may be said to be a symptom of all cases of tuberculosis, but the other symptoms vary considerably in accordance with the degree of inflammation and its location. Certain general symptoms, such as progressive loss of weight and strength, anemia, afternoon fever, and night sweats, are also frequently associated with all cases, regardless of location. But these do not always appear, some cases having few if any symptoms and presenting the appearance of fair health. Much depends on the bodily resistance and the extent to which the disease has progressed. In other words, by no means are all cases strictly typical; yet most cases fairly closely approximate the typical, so that a description of these forms will be adequate for giving the reader an idea of the extent of his condition and what is going on in the body. For symptoms, remember, are not the disease, but only manifestations of the body's unusual activities in eliminating the real disease, toxemia.

ACUTE TUBERCULOSIS

Acute cases of tuberculosis are by no means so frequent as the chronic; and this is fortunate, for

they are usually more fatal. However, if one has such a case there is no need to despair, as confidence and the right treatment will often work miracles. The acute cases usually occur under fifteen years of age, because children are more inclined to acute diseases of all kinds on account of their more rapid metabolism. Such cases are supposed to be due to the breaking down of a tubercle or a caseating (degenerating into cheese-like substance) group of tubercles so that the germs are quickly and widely disseminated throughout the body, giving rise to tubercle formation in practically all the organs. However, such a widely spread infection could occur only when there is a greatly reduced vitality and resistance coupled with a heavy toxemia. Therefore, the causes mentioned in the last chapter are more to blame than the tubercle degeneration.

The onset of the disease may last for a few days or be extended over several weeks. It is often mistaken for typhoid fever, but can be distinguished from this disease by the fact that there is no abdominal rash, hemorrhage from the bowels is rare, as a beginning symptom, and there are moist râles in the lungs. There is, however, a quite rapid loss of weight and strength, together with cough, rapid respiration, and feeble pulse. At first the mucus raised is white and frothy, later it becomes thick and yellow. The temperature is quite irregular, often making sudden jumps to as high as 104 degrees, but tending to the usual form of morning

sub-normal and afternoon elevation above normal. As the condition progresses and the fever becomes higher there may be delirium or convulsions followed by stupor. Every effort should be made to prevent the symptoms developing to this stage. There may be quite a variety of other symptoms, depending upon the degree to which each organ is affected. The covering membranes of the brain, intestines, larynx, etc., all may be affected, giving rise to the symptoms to be described hereafter under the special headings.

Sometimes the acute cases may start like pneumonia, with sudden onset, quite high fever, and considerable pain in the chest. The fever is not so constant, however, and in a few days it usually is easy to tell that something more than pneumonia is present. The usual general symptoms, as noted above, also appear; but the inflammation is largely confined to the lungs or the lungs and intestines. These cases are called quick consumption or galloping consumption, in distinction from the acute general cases where most of the organs of the body are affected at once. In all acute cases very prompt treatment of the proper kind must be adopted if good results are to be secured.

CHRONIC PULMONARY TUBERCULOSIS

The chronic causes of tuberculosis generally affect the lungs. If other parts are diseased it often is in addition to the lungs. Chronic pulmonary tuberculosis may begin like an acute case and gradually

subside to the chronic stage; but the majority of cases come on slowly so that the patient often is not aware of his trouble until it is fairly well developed. Chronic lung cases are usually divided into three classes: incipient, moderately advanced, and advanced. These are defined as follows, the symptoms mentioned being the maximum allowed for each class:

Incipient. Slight or no general constitutional symptoms, such as loss of weight and strength, shortness of breath, etc. Slight or no increase in temperature or pulse rate, expectoration small or absent, tubercle bacillus sometimes present and sometimes not. The lung involvement is limited to a slight infiltration in one or both apices or a small part of one lobe. There should be no tuberculous complications.

Moderately advanced. No marked impairment of function, either local or constitutional, but still more impairment than in an incipient case. There is marked infiltration of the lungs, but no cavity formation. There should be no serious tuberculous complications, such as intestinal or laryngeal involvement.

Advanced. Marked impairment of function, both local and general, such as pain, difficulty in breathing, loss of weight and strength, fever, night sweats, etc. Extensive localized infiltrations or consolidations in the lungs, or disseminated areas of cavity formation, or serious tuberculous complications,

such as involvement of other parts of the body, marked hemorrhage, acute pleurisy, etc.

In practically all cases there is a history of gradual loss of weight and strength. The patient finds that he becomes easily tired, and this increases to a point of chronic fatigue. Sleep does not seem to refresh fully, and general recuperation is slow. Often there are recurring colds, or catarrh, or bronchitis. A chronic cough appears, which is especially troublesome at night and early in the morning, and there is increasing shortness of breath. A slight pleurisy, coming on gradually and showing a tendency to recur and become chronic, is suspicious of tuberculosis. Constipation practically always is present; but this should be considered more as a cause than as a symptom of tuberculosis. Finally the cough increases, often becoming quite distressing; the expectoration becomes more profuse and changes from frothy white to thick yellow or greenish; the cheeks are flushed in the afternoons, and there are night sweats. If the patient has not thus far been examined these symptoms are usually sufficient to send him to a doctor, and the tuberculosis then is discovered.

If the condition is neglected the symptoms become increasingly worse, the fever rises higher, the sweats become more profuse and exhausting, and the loss of strength is such that ordinary activities become impossible. At any time during the appearance of these symptoms there may be lung hemorrhage. This is slight at first, the mucus being merely

streaked with blood, and it appears only after violent coughing. In more advanced cases the hemorrhages become more profuse, sometimes mounting to several ounces, and even slight coughs may induce them. On the other hand, some of the most severe cases do not have hemorrhages, so this is not a constant symptom. Also, some cases may not have fever or noticeable cough until the condition is quite advanced. But generally this is only in those patients who are taking fairly good care of themselves, in consequence of which the progress of the disease is retarded.

The degree of pain varies considerably. Some may have practically no pain and only late in the disease, while others notice this symptom quite early. Usually it first appears between the shoulder blades or just below them, but it may be present in one or both sides. Sometimes there is merely a feeling of tightness without actual pain. The degree of pain does not indicate the extent of the disease. Digestive disturbances are frequent, and there is loss of appetite, especially if the patient resorts to overeating in an effort to gain weight. There may be occasional attacks of diarrhea, even if the intestines are not tuberculous. The coughing interferes with sleep, and insomnia may develop.

The symptoms which appear on physical examination are sunken chest, hollow cheeks, hectic flush (small bright pink areas on the cheeks), fever of 99 to 102 degrees or occasionally even higher during the afternoon and evening, descending to 97 or

97.5 in the morning, rapid pulse, even when fever is not present, various adventitious (incidental) sounds in the chest, anemia, and the bacillus tuberculosis in the sputum. The abnormal sounds in the lungs are usually heard at the apices (tops) of the lungs, but may be heard over the bases of the lungs in the back. They are best heard when the patient coughs.

LARYNGEAL TUBERCULOSIS

When the larynx becomes affected symptoms referable to that organ develop. It is seldom that the larynx is affected alone. In most cases laryngeal tuberculosis is secondary to lung infection. The early symptoms include hoarseness and pain upon swallowing hot or cold liquids or hard substances. A chronic hoarseness is always suspicious of tuberculosis, even though it may be due to simple laryngitis. If the larynx is really tuberculous the hoarseness increases, and there are times when the voice is lost entirely. The pain on swallowing also increases, until in time it becomes quite severe. Sometimes it is worse when swallowing liquids and sometimes when swallowing solids. The pain may be constantly present even when not swallowing, and it may interfere seriously with sleep. The constant irritation in the throat leads to the secretion of large quantities of mucus which must be eliminated constantly. This coughing and rasping of the throat are not only painful but tend, in combination with the tuberculous condition, to produce local swelling.

This may interfere with breathing, especially when lying down. Upon examination the cartilages of the larynx are found to be swollen, especially the arytenoids and epiglottis. These parts may be ulcerated, also, or the vocal cords may be affected. When there is extensive ulceration there may be considerable destruction of tissue. Occasionally in very severe cases the epiglottis may be almost entirely destroyed. If neglected, the condition may become so bad that swallowing and breathing are extremely difficult, in which case there is danger of asphyxiation, as well as of starvation. There is no reason why these symptoms should develop, however, if proper treatment is employed.

INTESTINAL TUBERCULOSIS

If the vitality is especially lowered, some of the causative factors still are left operative, and if the patient swallows the sputum off and on instead of expectorating it, the intestines may become infected. Sometimes the intestines are infected in other ways, even before the lungs are involved; but in most cases where the intestines are diseased the lungs first were diseased. This is a serious combination, and there is danger of the peritoneum or lining of the abdomen also becoming affected.

The first symptoms usually are pain, intestinal gas and diarrhea. The appearance of these symptoms does not necessarily indicate that the intestines have become tuberculous, as they may be caused by improper diet. If the diarrhea is persistent, how-

ever, if the pain increases until it becomes intense and the abdomen becomes swollen and distended, one can assume that intestinal tuberculosis is present, especially if the lungs are known to be affected. Other symptoms which may appear are dry, harsh skin, dilated pupils, and hemorrhage from the bowels. Fever generally is high in these cases, and sweating is profuse. The latter may give rise to an eruption of whitish vesicles on the skin as a result of retention of the perspiration in the glandular ducts or between the layers of the epidermis. The patient becomes very much emaciated, because the food is not properly digested or retained long enough for absorption and because of the profuse sweating which depletes the body of water. All the general symptoms are correspondingly increased. Very careful treatment will be required to check the disease when it has affected the intestines.

GLANDULAR TUBERCULOSIS (TUBERCULOUS ADENITIS)

Tuberculosis of the glands often occurs independently of pulmonary tuberculosis. If the lungs are affected, some of the glands, especially about the neck and chest, almost certainly will be diseased, but seldom to the extent that special glandular symptoms will develop. The trouble in the lungs seems to give sufficient eliminations so that the glands are not so actively or severely affected. Glandular cases may not be accompanied by general symptoms when the lungs are not affected. Usually, however, there is some

degree of loss of weight and strength, and various digestive disturbances. Fever usually is slight or absent. There seldom is coughing, and the lighter cases may appear to be in good health except for the swelling of the glands. This swelling comes on gradually with little or no pain. As the swelling increases, however, there is tenderness upon friction or pressure. If the condition is not checked the glands begin to suppurate (form pus), and abscesses and fistulas are formed. A fistula may appear as a drain for the pus from the gland, even without definite abscess formation. There is a constant slight discharge, and the openings usually are very chronic and hard to heal. Acne and similar skin eruptions also may develop. When there is much suppuration the general symptoms, including fever, often will appear; and in any case the general health soon will show the effects.

The glands of the neck, chest, and axillæ (armpits) most often are affected, but glands of part of the body may be, including such glands as the testicles. When the latter are affected the parts become swollen and the spermatic cord and other tissues around and supporting the testicles become thickened. The skin is adherent to the glands. The trouble usually starts gradually with but little pain; but if it advances there may be considerable pain, with abscess formation and discharge of pus.

In children, tuberculosis of the glands often is called scrofula, though this term gradually is falling into disuse in favor of tuberculous adenitis. The

symptoms are much as described above, except that suppuration practically always occurs and ulcers frequently form. There may be sore eyes, running ears, and skin eruptions. The muscles are soft and flabby. If the condition is present to any marked extent there usually is fever, since children are inclined to acute symptoms, in which fever usually is prominent. In such cases emaciation also occurs, and there is a definite anemia. Often the glands in the lining membrane of the back of the abdomen become infected, producing a condition called tabes mesenterica. These cases exhibit wasting of the limbs and trunk, with great swelling of the abdomen from gas. This naturally causes considerable pain. Diarrhea with offensive stools is present, even if the intestines themselves are not tuberculous. If the disease spreads, the membrane in the front of the abdomen may become affected, giving rise to uneven, tender, and painful swellings, which can be easily felt under the skin. Generally it is only the cases which have a very poor physical heredity and very poor health environment which develop to this stage. Most cases of tuberculous adenitis in children are limited to some swelling and suppuration of the glands about the neck.

BONE TUBERCULOSIS (TUBERCULOUS OSTEITIS)

Bone tuberculosis generally occurs independently of the pulmonary variety. Children most often are affected. Either the shafts of the bones or the joints may be involved. Often the disease spreads from

the bones to the joints. The bones adjacent to the hip, knee, and elbow are the regions most often attacked. When the joints are involved the most common sites, in children, are the hip, knee and ankle. In adults the wrist, elbow, and shoulder may be involved. The earliest indications of tuberculosis of the bones may be seen in the muscles. It will be noticed that they are gradually wasting away, especially just above and below the point where the bone is affected. Spasm of the muscles may be noticed, and rigidity usually is present when the spine or hip is affected. Deformity may result because of the unequal pull of the muscles, the atrophied ones being unable to balance the normal tension of those unaffected. There naturally is considerable lameness, the parts are easily tired, and light pressure causes a sudden severe pain. When there is no pressure pain may be absent or slight.

The disease usually is divided into three stages: (1) Stage of localized infection where only the bone is involved; (2) stage of involvement of the entire joint, including the ends of the bones and the ligaments; (3) stage of destruction of the parts and the external discharge of pus.

Of the joints, the hip is most commonly affected, and a description of the symptoms of "hip-joint disease" will serve as an example of those occurring when other joints are affected.

In the first stage there is very little constitutional disturbance. The chief symptoms are limping, slight flexion of the affected hip joint, swelling of the

glands in the groin of the affected side, pain, which often is referred to the knee, and wasting of the muscles of the thigh and buttocks. In the second stage all these symptoms are intensified, and there is grating of the joint and, frequently, abscess formation. When an abscess appears the general health begins to show signs of failing. There is loss of appetite, paleness, irritability and, often, slight temperature. Sometimes diarrhea occurs. Upon falling to sleep, the patient is likely to awaken suddenly with a loud cry. This is because of the sudden pain induced by rubbing of the sensitive diseased joint surfaces as the tense muscles relax. In the third stage the general symptoms are still further increased, and greater deformity develops. The thigh is both fixed and adducted, so that the leg apparently is shortened. The joint may become entirely dislocated. With these extensive changes the pelvis naturally is affected, being tilted upward and backward and causing a forward curve of the spine. On account of the shortening of the leg there also is a double lateral curvature of the spine. If proper treatment is adopted so that recovery ensues, the inflammation subsides; and as the pus and débris are absorbed ankylosis fixation of the joint occurs. Permanent deformity results, but the patient lives. There are few cases of this disease where there is not some resulting deformity unless proper treatment is adopted very early. If the condition is not properly treated the continued inflammation destroys the joint, and the general health is so affected

that some other part of the body becomes tuberculous—a combination that is too much for the vitality, and death results. However, most cases recover, as children respond readily even to partly rational treatment.

Tuberculosis of the spine is a frequent form of bone tuberculosis. The first symptoms are a sense of weakness, with a disinclination to move the back. This develops until the spine is held rigid, and at this time there is pain in various parts of the body due to irritation of the spinal nerves, and also tenderness upon pressure over the part affected. The pain is worse after standing and may disappear entirely when lying down. The rigidity of the back leads to a peculiar stiffness in walking. The patient is usually averse to any kind of activity. If the disease is allowed to progress, suppuration sets in, with abscess formation; and there are the usual general constitutional symptoms of tuberculosis as already described. The pus from the abscess usually travels some distance before it comes to the surface of the body. Thus the opening may appear in a loin or in a groin; or, if the upper spinal vertebræ are affected, in the pharynx. With the appearance of suppuration there naturally is destruction of the tissues, not only of the bone but of the cartilages between and about the bones.

With the destruction of the tissues and the formation of pus, pressure against the nerves and spinal cord will develop and paralysis will occur. The location and degree of the paralysis will depend

upon the location and degree of the inflammatory process. Loss of motion practically always precedes loss of sensation. The paralysis generally comes on gradually, affecting the limbs first and making walking and arm movements awkward and difficult. In advanced cases there usually is severe pain, with spasm, rigidity and wasting of the muscles. If the upper spine is affected there may be interference with breathing and swallowing, and there is a frequent dry cough. If the middle spine is affected there often is a sensation as of a tight band about the body. When the trouble is in the lower spine there is irritation of the bowels and bladder, with frequent stools and urination.

The extent of the deformity depends upon the stage of the disease. Naturally, there is no deformity at first. As the disease progresses, however, and the bones and cartilages are destroyed, the spine sinks forward and the processes on the backs of the vertebræ project backward, giving a humped appearance. In order to make up for this curve other curves are developed above and below the affected part so that the body may still be held upright. This deformity is most marked when the disease affects the thoracic region. In this case, also, the chest will be compressed and the movements of the lungs and heart impaired. When the cervical region is affected and the destruction of tissue is extensive the head may be displaced forward so that it appears to be in front of the spine. The most common part of the spine to be affected is the junc-

ture of the thoracic and lumbar regions, or the upper part of what is familiarly known as the "small" of the back. Here the bodies of the vertebræ are large and more subject to strains and injuries which may weaken them and render them susceptible to inflammation when other conditions are favorable.

When proper treatment is adopted healing may occur at any time. If there has been more than a slight destruction of tissues some ankylosis (consolidation of a joint) is bound to develop. This is necessary in order to maintain the strength of the spine. The pus and débris formed when the bones are being destroyed by the inflammatory process dry up and are absorbed as the causes are removed; or sometimes they are discharged externally, after which the sinuses through which they discharge usually close up. The remaining parts become welded together by the formation of new bone, and bony splints are produced as needed. In all except the lighter cases there is certain to be some deformity; but if proper treatment is adopted early this need not be extensive nor such as to interfere with normal health and activity.

SKIN TUBERCULOSIS (LUPUS VULGARIS)

The skin cases of tuberculosis often vary considerably in their manifestations, but there always is the characteristic tubercle. These cases usually occur independently of lung infection. Most cases begin before the age of twenty, and often before

the age of ten. The parts affected usually are the nose, cheeks, and ears; but the entire body surface may be involved, and occasionally the mucous membranes, or the cartilages of the nose, mouth, etc. There usually are no symptoms except those which can be seen upon the skin, though in advanced cases there may be some pain, and usually the general health is affected as in all cases of tuberculosis. Generally the first symptom noticed is an eruption of very small reddish, yellowish or brownish soft, flat lumps. These may be close together and arranged in various patterns or they may be widely disseminated. These little lumps gradually grow to the size of a pea or larger and become harder. Finally they coalesce into irregularly shaped, dull red, raised soft patches. They may go no further than this, especially if proper treatment is adopted. If such treatment is not employed the tubercles may degenerate and form ulcers. The disease is usually very chronic, and when healing does result there is considerable scar formation.

Before closing this chapter I want again to call attention to the fact that *the symptoms are not the disease,* but merely the signs of the body's activities by which it undertakes to eliminate the real disease, toxemia. You must not imagine, therefore, that you have to force food into your body in an endeavor to increase weight because you are thin, or rest interminably because you are weak, or take drugs to suppress the fever and cough, or cut out infected glands or joints. All these symptoms are present

because they are necessary; and when their causes are removed they will disappear. To attempt to overcome symptoms without removing causes is to invite disaster. It is very much inclined to bring on complications. I do not mean by this that symptoms should be entirely disregarded, because they sometimes need to be controlled; but do not develop an exaggerated idea of their importance. Especially is this true in the matter of weight. Many patients believe that if they can only gain weight they will be all right, whereas it is quite possible to gain weight and grow worse. They keep their minds constantly on the subject of weight; and if they lose a little they become greatly depressed, or if they gain a little they may be unduly stimulated and become careless in neglecting other necessary treatment. Let symptoms be a warning or a barometer of your progress, but do not worry about them. Try to keep a sane, balanced attitude of mind toward your entire condition, concentrate on fundamentals, and the symptoms will take care of themselves.

CHAPTER VI

Treatment of Acute Tuberculosis

THE treatment of all acute diseases should be started early. Practically all such diseases begin in much the same manner—with a feeling of general malaise (indisposition) followed by chills and fever. At this stage it is impossible to tell just what is developing; but from the standpoint of natural methods of treatment it is not necessary to know. We know that the body is starting an eliminative crisis, and we should want to assist it in every way possible, as well as to avoid adding any more poisons to the accumulation already present. If the proper treatment is begun at the very onset of the symptoms the trouble often will be aborted and in all cases will be greatly lessened in severity. This is especially important in cases of acute tuberculosis, where weight and strength usually are lost rapidly and where results unfortunately are all too unfavorable under orthodox methods of treatment.

In the cases which start like typhoid fever—where there may be two or three weeks of general uneasiness, loss of weight and strength, etc., before much fever develops—it still will not be too late to start treatment when this stage has been reached. However, the genuine Physical Culturist takes warning at the first signs of discomfort; and even if he does not adopt strict treatment at once he will begin

to seek causes for his lack of the usual "pep" and will modify his habits of living to some extent, such as modifying the diet, getting more rest and fresh air, etc. In this way some of the necessary measures will be started before the disease has an opportunity to make much progress. In cases which start more like pneumonia—when the fever comes on quite quickly—there need be no delay in starting treatment. If the trouble has been neglected and other parts of the body have become affected or complications have developed, these should be treated as described in the special sections devoted to that particular manifestation. As most acute cases occur in children, it might be well to read the chapter on treatment of children's cases, also.

In an acute case the body is very toxic and body cleansing is very necessary. But at the same time the energy must be conserved, because it is already depleted; and all that is left will be needed to support the unusual functional activity present during a crisis. Systemic cleansing takes energy. Hence, a careful balance must be maintained between the cleansing and the building measures employed, in order that the energy may not be so depleted as to make healthful reaction impossible.

As a primary measure in the conservation of energy, absolute rest is very necessary. This is indicated by Nature, since when there is fever there is a desire to rest, and sometimes so great prostration as to make anything else well-nigh impossible. Therefore, as soon as the patient realizes that acute

symptoms are approaching he should go to bed immediately, and stay there until there has been definite recuperation after all fever is gone. This is very important. If the patient tries to be even moderately active the fever will be much more persistent. He should not leave the bed to go to the toilet or for anything else. The body needs all its energies to purify and protect itself and has none to spare for muscular activities. Rest should include the organs as well as the muscles of the body. This means that no food should be taken, because eating makes work for all the organs. Generally there is no appetite, which is proof enough that the body does not want food, has no need for it, and cannot take care of it properly.

Feeding should be stopped as soon as acute symptoms develop. Plenty of water should be taken, however, a glass an hour or even more. This may be flavored with lemon or orange juice, if especially desired, but not sweetened. If the patient is afraid of the absolute fast or if there is a definite appetite for it, orange juice may be taken in addition to water, employing six or eight oranges per day. It usually is well to employ the fruit juice in any case after the first three days on water. In the milder cases the pulp of the fruit may be taken in addition to the juice. If unable to secure oranges, or if preferred, unsweetened grapefruit and its juice may be employed. Other fruits that may be used are pineapple and grapes. The orange and grapefruit usually are best, however. They may be taken at any

time desired, regularity not being especially necessary. Often a combination of orange, grapefruit and pineapple juices mixed will agree very well.

The bowels must be thoroughly cleansed with a high enema on the first day, and if there seems to be much refuse in the intestines, this should be repeated daily for three days. Otherwise the ordinary low enema may be employed daily for the duration of the fast or fruit diet. The high enema is taken with an ordinary fountain syringe, except that the long soft rubber colon tube is used instead of the hard rubber enema tip. This is sterilized by boiling, lubricated by dipping in sterile oil, and inserted gently for 12 to 18 inches. A good plan of lubrication is to "feed" the tube into the rectum from a shallow pan containing oil, in which the tube lies coiled. A very little water may be allowed to enter while the tube is being inserted, in order to clear the way. Several quarts (as much as three or four) of plain warm water, at slightly above body temperature, should be used. It should be injected in the "knee-chest" position (on knees and elbows with hips elevated) whenever possible; otherwise the right-side-lying position, or the position on the back with the hips somewhat elevated on a pillow may be employed. These same positions are best for the ordinary enema, also, but for this three pints to two quarts of water generally are sufficient. The water should not be retained more than two or three minutes. With these enemas and

the water drinking the alimentary tract and to some extent the tissues should be cleansed.

After the five to ten days of fasting and fruit the milk diet should be adopted. On the first day half milk and half water is used. It is very necessary to have raw (unpasteurized) milk. If living in a city requiring pasteurization the certified milk should be secured. In the majority of cases the following is the best schedule. About six ounces of the half-and-half should be taken slowly every two hours during the first day—six feedings in all. On the second day six ounces of whole milk should be used every two hours; on the third day eight ounces. After that the same quantity should be used per feeding, but the frequency to be increased to the following intervals: ninety minutes, sixty minutes, forty-five minutes, thirty minutes. When taking the milk every thirty minutes, six quarts will be consumed during the day. In the case of children the maximum quantity, of course, will be limited according to age. In addition to the milk the juice of two or more oranges may be taken each day, at any time desired but usually the first thing in the morning.

The rate of increase and total quantity of milk used in individual cases will depend upon the conditions present. If fever still persists after the orange diet, not more than three quarts per day should be taken (a glass every hour); and for children half the usual quantity. In these cases of fever more oranges may be used—up to six, eight or ten per day. If the milk is not well tolerated in

any way the quantity may be similarly limited, using whatever amount can be handled with comfort. The less milk taken the more fruit may be used. Other fresh fruits besides oranges may be used in season, except cherries and, sometimes, apples. Some cases may find that skim milk, buttermilk, or soured milk will agree better than the whole sweet milk, and these forms may be used entirely or in part. When using sour milk it generally is permissible to take two dates or an equal weight of raisins with every other glass of milk or with every glass if not more than three quarts are being taken during the day, though when there is fever it usually is best to take the milk alone. In cases where only a small quantity of milk can be taken but where the need for nourishment is imperative, one or two egg yolks in orange juice may be taken each day. No other solid foods are allowed when taking the milk diet. In most cases the milk and fruit can be satisfactorily adapted to the individual's needs so that other additions will be unnecessary.

It occasionally may happen that, for some reason, the milk diet cannot be used. Every effort should be made to secure the milk and use it as a strict diet, as it is most effective when properly employed. But if solid food must be utilized the following diet is one of the most admirable that can be employed. In breaking the orange diet following the fast the milk is employed as has been described until three quarts have been taken in one day. Then on the next day three glasses of milk with fruit should be

used for breakfast and lunch, with a light meal in the evening consisting of a raw vegetable salad and some sweet fruit, such as thoroughly ripe bananas, dates, figs, or raisins. I do not specify the exact quantities, because these will vary in individual cases. Masticate thoroughly and stop eating just before you have had "enough," and you should have no trouble. This diet may be continued for many days; or, on the next day regular meals may be resumed, using such menus as are given in the next chapter but still limiting quantities for several days longer. Raw foods are particularly important and should be given the preference. If there is fever only raw fruits and green vegetables, perhaps with two egg yolks per day, should be taken until the temperature is normal, in this case breaking the orange diet as described in the next paragraph.

Where milk is unobtainable it will be necessary to employ solid foods immediately after the fast and fruit diet. The following plan usually will be satisfactory. On the first day three meals may be taken, consisting of a cup of strained vegetable broth and five or six raw soaked prunes. The oranges or other acid fruits may be taken as desired between meals. On the next day the same meals may be taken, with the addition of several leaves of lettuce. On the next day a combination salad of lettuce, celery, and grated carrots may be used, instead of lettuce only. On the fourth day regular meals may be resumed, the same as advised after breaking the fast of orange diet with milk. The

A good example of a sleeping porch. One awning is shown lowered but it should be kept up most of the time. It may be let down to protect from rain or to shut out the sun if the patient desires to sleep during the day.

greatest care always must be observed not to overeat.

Fresh air night and day is extremely necessary, as it not only further aids in cleansing the body but it also gives the patient strength. The idea that we get strength from food alone is very erroneous. Good fresh air and plenty of it is always of primary importance in any case of tuberculosis, acute or chronic—and in any other disease, for that matter. If circumstances permit, the patient should have his bed placed out of doors, with just sufficient protection to guard against storms. If unable to do this, an unusually well ventilated room should be selected. Fifteen hundred cubic feet of air should be available, which is equivalent to that supplied by a room fourteen feet square and eight feet high. Windows should be on at least two sides of the room, and the more the better. They should never be closed except when the patient is having a bath or is otherwise exposed in some way in cold weather. In good weather it is often of value to remove the window sashes in order to have more open space. In bad weather the use of cloth window ventilators usually will keep out rain and snow and still permit the passage of some air, or foot-wide boards may be fitted to rest upon the lower window frame, slanting inward and upward, to direct upward the air that enters through the raised sash. In cold weather the room may be partially heated. Any arrangements that can be made to add to the patient's sup-

ply of fresh air will be of definite benefit. Of course, no one else should occupy the room.

With complete rest, water drinking, enemas, and fresh air it is often possible to eliminate the fever within five days on the fast or oranges. If it is not gone within seven days but most of the other symptoms have improved, it is well to break the orange diet, because tuberculosis is one disease where modified feeding may be permitted even when there is fever. Further orange dieting may be taken later. It is seldom advisable to go further than three days on the complete fast and seven days on oranges, or a total of ten days at the start, owing to the rapid loss of weight and strength associated with the disease; and in most cases a total of five days on the fast and orange diet will be sufficient.

If fever goes above 103 degrees, a cool sponge bath may be given to reduce it. A tepid sponge bath should be given daily in any case; and strict cleanliness of the clothing and bed clothing should be observed. The patient should wear as little clothing as possible; nothing at all when warmth can be maintained. In giving baths in bed it is best to bathe one part and dry that part before proceeding to the next part, keeping the body covered except for the part being bathed. Bathing should be fairly rapid so as not to expose the patient for any great length of time, though, of course, in warm weather it is not necessary to use this care. The temperature of the bath should be gradually reduced until

it can be taken fully cold, or at about 60 degrees and enjoyed and reacted from.

If there is much pain in the chest or abdomen a cold pack to these regions may be applied daily for two hours. This consists of several thicknesses of muslin or linen cloth wide enough to cover the chest or abdomen and long enough to go completely around the body. It is wrung out of cold water, applied quickly and snugly, and completely covered with a heavy dry woolen cloth, such as a piece of old blanket, of two or more thicknesses. The woolen cloth should be somewhat wider than the under cloth, so as completely to cover it and prevent all air from contact with the wet pack. This in turn is covered with mackintosh, if available, or any other impervious material. When properly applied the pack soon becomes warm, and sweating should be induced within two hours. If there is not much fever, or if the patient feels chilly, or if there is actual pleurisy, a hot pack may be applied, using hot water bottles to maintain warmth.

Air baths, dry friction baths, and nude sun baths also should be used. The air bath may be given at any time and continued as long as possible without chilling. In the winter time it may be impossible to give these unless able to heat the room quickly, because the patient's supply of fresh air should not be cut off for long at a time. The air bath is simply exposure of the nude body to the air. It is soothing yet tonic, and gives the body an opportunity to absorb more oxygen. An assistant can administer dry

friction with the bare hands at the same time. The friction should not be continued longer than ten minutes, however, and may be omitted if the patient is very weak. It should be omitted if the patient has much fever.

Sun baths are employed whenever circumstances permit. For results, it is necessary that the unobstructed rays of the sun reach the nude body. They are best taken out of doors, but may be taken inside if the sun shines freely through an open window. The upper sash may be lowered; the bottom sash, then being closed, will protect from draft and may be covered to give privacy if necessary. The room should be heated for the sun bath in cold weather. Exposures must be short at first and increased gradually, especially in summer, beginning with five to ten minutes, depending on the condition of the patient and the heat of the sun. The hotter the sun and the weaker the patient the shorter the initial application. The rate of increase practically always is the same, two minutes per day—one minute for each side (front and back), as both sides, of course, should be exposed. The maximum length of application is four or five hours.

When there is fever, however, it is necessary to limit the applications considerably. In such a case the feet only are exposed the first day, then the feet and legs up to the knees, then up to the hips. After several days the abdomen may be included, and in a few days more the upper body and back. The time for the initial application and the rate of

increase should be adhered to for each part until the whole body is being exposed, when it may be considered as a unit. The head should be covered until the general condition is considerably improved, and some cases may have to follow this plan always. At the conclusion of the bath a brief application of cold water should be made to the parts which have been exposed. The maximum application, until all fever is gone, should be limited to thirty minutes. If possible, the bath should be taken at a time of the day when there is no fever. If the fever is over 101 degrees the sun bath must be omitted.

Whenever possible to secure ultra-violet radiations from the special lamps designed for their application, these are to be preferred to the natural sunlight as long as there is fever. Many people have these lamps in their homes, there being made for home use smaller lamps than are devised for physicians' offices, hospitals and sanitarium use. The applications must be begun carefully and increased gradually, the same as for the sun baths, except that the initial exposure usually is two or three minutes with the lamp at a distance of 35 inches from the body. Much depends upon the individual's reaction. Particularly for this reason it is best to have the advice of a doctor when using this treatment. These radiations are of the utmost value when unable to secure natural sun baths for any reason. One or the other, however, is a very necessary part of the treatment.

The patient should sleep as much as possible, as the body works best toward overcoming debility and disease during sleep when all conscious interferences are removed. At this time all the energies of the body can be devoted to remedying anything which may be wrong within it, and at such times the most rapid progress is made. There may be less inclination to sleep when the patient is resting constantly, but the practise of mental and physical relaxation will help much to induce it. If sleep itself does not come for any certain increased number of hours, the full relaxation will be almost as good. In any case, useless expenditure of energy in waste motions, unnecessary activity, visiting, and worry and other destructive emotions should be avoided.

Control of the thoughts is quite important. Often the diagnosis of acute tuberculosis is sufficient to frighten many people almost to death, and many times the doctor makes no attempt to encourage the patient. The importance of adhering to strict treatment can be emphasized without frightening the patient. Relatives and friends also should be as cheerful and optimistic as possible or give way to those who can cheer, at least not depress the patient. Any supposed friends who come in and talk about everyone they know who is sick or has just died, should be gently but firmly shown the door and denied further admittance. The patient himself should realize that recovery depends upon being confident and persistent in helping the body cure itself.

He should have no doubt whatever as to ultimate recovery. Autosuggestion is also of value.

In all cases where fever persists after the first fast and orange diet, an additional fruit diet of three days should be taken as often as the weight and strength will permit until the fever is completely eliminated at all hours of the day. Even if fever does disappear after the first fast and orange diet it is well to take the fruit for a day or two every month until recovery is established. Overfeeding never did anybody any good. The important thing is to utilize completely all the food taken so that there is no excess to lie in the intestines, ferment and putrefy, and add to the toxins already in the body. The repeated orange diets are very effective in improving the digestive and assimilative ability, as well as in detoxifying the body.

The other measures which have been described for purifying and strengthening the body must be continued as long as necessary. It is well to continue rest in bed for at least a week after fever is gone, and most cases will require more than this time for recuperation, because of the rapid destruction of tissue in acute cases of tuberculosis. It is often advisable to remain in bed until most of the symptoms have subsided and weight has been restored nearly to normal. The patient may then get up gradually, first sitting up a half hour at a time, gradually lengthening this to two hours, then getting up for meals, then walking. Walking should be started with five-minute periods and increased three

to five minutes per week according to the ability. At this stage the procedure is practically the same as in chronic cases.

If advantage is taken of the simple forces of nature, such as air, sunlight, water, and plain foods; if the body is given an opportunity to utilize these forces through rest, relaxation, sleep and, later, graduated exercise; and if proper control of the body is maintained by the mind at all times, there is no reason why recovery should not be certain in the great majority of cases.

CHAPTER VII

Treatment of Chronic Pulmonary Tuberculosis

THE picture of the typical case of chronic pulmonary tuberculosis showing emaciation, weakness, hectic flush and cough indicates to anyone that the primary need here is to build more vitality, to increase the energy, and to promote resistance. The ordinary person would say that more vigor is needed to fight the disease. This is not strictly the case, as the disease does not need to be fought but to have the causes removed. Yet there certainly is a need for more vital power. What are the sources of this power? Air, sunlight, water, food and sleep. Then when there has been a small surplus of vital power accumulated it generally is necessary to create a demand for more through exercise.

However, one can build only when there is a solid foundation upon which to construct the edifice. In order to build health it is necessary to have the solid basis of clean tissues. But to cleanse the body takes energy, and the patient may have little or none to spare. In cases of chronic tuberculosis it usually is not possible to cleanse the body thoroughly before employing the building measures. A compromise must be effected between the cleansing methods which take energy and the building measures which give vitality. Fasting is, of course, the pri-

mary method of cleansing; but a long fast is not advisable in these cases. Some persons have taken long fasts with good results; but I do not advise them. Too much weight is likely to be lost, and this may be difficult to regain. Not that the weight itself is so important, but there is such a thing as reducing the energy and reserve force to a point where this becomes insufficient to react or where the reaction becomes very slow. Moreover, certain nourishing elements, such as the mineral salts and vitamins, are very necessary, and few persons who are in such a condition as to develop tuberculosis have sufficient of these in the body to last them during a long fast. An extra supply of these elements is required, rather than a lessened one. The best plan, therefore, is to do a little cleansing while resting to save energy, then a little building, then a little more cleansing, then more building. In this way the body is nursed along to the point where it can overcome the morbid processes.

Fortunately it is possible also to build while cleansing. Air, for instance, not only cleanses but furnishes necessary building elements. The same is true of water. Sunlight is cleansing through its antiseptic action and its stimulating effect on the skin, but also building through its effect on the chemical composition of the blood and the energy contained in its rays. By a judicious use of all the forces of Nature the special needs of the body during tuberculosis can be met. To sum up, we should assist the body in every possible way, and interfere

with it not at all. To this end we use rest, diet, air, sunlight, water, exercise, and proper control and use of the mental processes.

REST

Our medical contemporaries will tell you that rest is 50 per cent of the treatment of tuberculosis, and some rank it even higher. Some of the enthusiastic ones will claim that it is impossible to get too much rest. But the body never was intended to stagnate. While rest may be 50 per cent of the treatment at certain stages it is not always so, and indefinite rest is certainly not to be recommended. However, without doubt a certain amount is of the greatest assistance. A penny saved is a penny earned; and if one cannot earn or build energy he at least can conserve what he has. This is the purpose of rest. Rest is employed during the initial period of the cleansing, which makes subsequent building possible. It also is used afterward to balance exercise and to guard against any possible shortage of energy which might occur as a result of too much enthusiasm on the part of a patient just beginning to feel like himself again.

The exact amount of rest required will depend on the stage of the disease and the general condition of the patient. For instance, in incipient cases where the general health is still good and there is little or no fever it may not be necessary to go to bed, but merely to get plenty of night sleep and, perhaps, an extra nap during the afternoons. In a moder-

ately advanced case it usually is well to go to bed for a time; but one need not be so careful to avoid all exertion as would be the case in an acute condition. In an advanced case, with well marked fever, complete rest in bed will be required until several weeks after all fever is gone. The general condition of the patient may not always coincide with the stage of the disease. Some incipient cases may be quite reduced in vitality and be highly toxic. These should rest, as should a more advanced case. In advanced cases which still have considerable energy it may be possible to get along with less rest; but usually it is well to treat them according to the stage of the disease. In any case, even the lightest, it generally is advisable to go to bed for a couple of weeks, in order to get a good start. After this, the degree of activity may be determined by the stage of the disease, the effects of the degree of activity attempted, the general condition, and the rate at which the patient is responding to treatment. It seldom is necessary to remain in bed more than six or eight weeks, except in the most advanced cases. Remaining in bed for a year and, sometimes for two or three years is not to be recommended. If such extended rest seems to be required there is something wrong with the treatment. Under the right kind of treatment the fever will be eliminated within from one to six weeks, and two or three weeks after this will be sufficient time to remain in bed. Of course, one does not get up suddenly and resume

all his old activities. This must be done only very gradually.

The usual plan of resuming activity will be about as follows: On the first day it is deemed advisable, the patient may be allowed to sit up in bed or in a chair for half an hour during the morning and for the same time in the afternoon. The successive following days the time may be increased to forty-five minutes, then an hour, then ninety minutes, then two hours. Or such increase may be made every two or three days. After this the patient may be allowed to get up for meals, which, however, should still be served in his room for several days. If there are no stairs to climb he can then go to the dining room for meals; or if he is taking milk or if there are stairs to climb he can practise walking about the room for a few minutes at a time, resting between times and not being up more than forty-five minutes at one period. About ten days from the time he first gets out of bed he should be able to go down and slowly up stairs and be up about two hours per day. This can be increased gradually to four hours a day, two in the morning and two in the afternoon. At the end of the third week he can start exercise, as will be described later on in this chapter. Even after the point is reached where considerable exercise can be taken the patient should be in bed ten hours during the night and four hours during the day. This plan should be continued until a fully normal condition has been restored. I might say, however, that when this time is approaching the pa-

tient need not rest in bed the full four hours during the day, but can spend three of these hours in an easy chair or recliner. This plan is not to be considered arbitrary, but merely as a model. The rate at which the patient can advance from rest in bed to exercise will always depend upon how long he has been in bed and how he reacts to the increased activity. "Make haste slowly" is a good motto at this time.

It is very important that the patient *rest* while he is resting. This may seem an unnecessary admonition; but it is surprising to find how few people know how to rest. Rest means relaxation, if not sleep. The more sleep the better; but when this cannot be induced, thorough relaxation will answer very well. In order to be sure that he is perfectly at ease the patient should go over the entire body mentally to see that every muscle is completely relaxed. He should say to himself "Let go!" It sometimes helps to raise a limb and then let it drop perfectly limp, repeating with all four extremities. Taking a deep breath and letting it out quickly is helpful, also. Every voluntary effort should be suspended, except as stated. After the body is well relaxed the mind should be given attention, making it as nearly as possible a blank. Of course, such complete relaxation is not necessary during the entire day when a person is in bed all the time; but at no time should there be unnecessary tension. It will be especially necessary to give particular atten-

tion to relaxation while resting when the patient is up a good part of the day.

I have already said something of the importance of sleep in the chapter preceding this one, but I wish to add a few points here. It has been said that sleep is "Nature's sweet restorer." If any one needs restoring it is the tuberculous patient. Sleep is the silence during which Nature does her best work. When awake, even while resting, the conscious mind is busy with many things; this is bound to have some effect on the body. All too often it is busy with the wrong kind of thoughts, and this definitely interferes with progress. Even reasonable thinking takes some energy and distracts that part of the mind which governs the functions of the body. On the other hand, while asleep all conscious activities are suspended, the guiding intelligence within has full sway (except perhaps for a few bad impressions made during the day), and it then can do its best work. Relaxation is more perfect during sleep, and this means that the circulation is more free, there is less interference with nerve action, and every function is being performed more perfectly. It is chiefly during sleep that energy is recuperated and stored up. Hence, one can readily see that the more one can sleep the sooner will he get well.

Let no one think, however, that he should take medicines to induce sleep if he should find it difficult to slumber naturally. By no means should sleep be induced by a hypnotic or a narcotic. Such sleep has little value, for it is brought about through in-

terfering with nerve action. One is but little if any further along toward recovery after such sleep is ended. Moreover, the after-effect is increased irritation and tension. While it might be permissible temporarily to use some of the milder hypnotics in extreme cases where sleep is prevented by severe pain, when other proper measures are being used at the same time, still I can not recommend the practise. The less of this done the better for any patient. The strictly natural methods for relieving pain and inducing sleep will be quite satisfactory. Heat practically always relieves pain; and sleep may be induced by relaxation of mind and body, slow deep breathing, the neutral immersion bath, hot spinal compresses, gentle spinal pressure, and autosuggestion. The latter will be covered later on in this chapter. Peace of mind and comfort of body are important factors in producing sleep; and if the patient is being treated rightly his progress will give him peace and Nature will give him comfort. Internal discomfort is present only when it is necessary; and if one works with instead of against the body there will be no need for it. In most cases it should be possible for the patient to sleep nine or ten hours during the night and one hour during the day.

Another form of rest which is of the highest importance is sexual rest. The body needs all its energy in order to restore a normal condition, and there is none left to spare for physical sexual expression. The patient must decide to forget all about

such expression until complete recovery has been brought about. The mind may be kept away from sexual matters by keeping it busy with the various duties of the day and with constructive thoughts for the benefit of oneself and others. Of course, the patient will sleep alone.

DIET

The subject of diet for tuberculosis means to many people, and even to many practitioners of the healing art, simply eating as much as possible, including plenty of milk and eggs. "Plenty of good wholesome food" is the usual prescription. It is self-evident to any thinking person that this can lead only to trouble, for if the patient has been losing weight while eating his usual and often more than his usual quantity of food, it must be because his digestive and assimilative organs are not working as they should. To call on them for more work will exhaust them further. Eating more than the body needs or can handle always wastes energy. What is the use of resting in bed to save energy and then wasting it by overeating? While resting in bed one needs less food than when active, for less tissue is being destroyed and less energy is being used. It will simplify matters greatly if the patient remembers that strength comes as much from air, sunlight, water and sleep as it does from food. The old idea that one must eat to keep up his strength has been exploded long ago; but like many such ideas it still persists in the minds of many people. Another

thing to remember is that it is unnecessary to feed especially for weight gaining. When the body has been cleansed and the energy increased the weight will take care of itself. The addition of weight does not indicate, necessarily, that the condition is being improved. If the weight is low it is because it needs to be low in order that the body may not have to spend a lot of time and energy in building tissue and removing its waste products; or because there are physiological abnormalities that must be overcome before sufficient nutriment can be digested, absorbed and assimilated to increase the weight. Feed for health, and the weight will be adequate.

In feeding for health the important thing is to use moderate amounts of highly vital foods, with short periods of abstinence for internal rest and cleansing. Some may wonder why internal rest is necessary. They know that they must rest their muscles; but they think their organs will keep on working indefinitely. They feel that internally they have solved the problem of perpetual motion—until one day they wake up to find something, perhaps everything, broken down. Even the heart must have its rest between beats. So is it necessary to give the digestive and assimilative organs a rest from time to time in order that they may the more perfectly handle the food during their periods of activity. Regular periods of abstinence act as a tonic and greatly improve the digestive and assimilative abilities. They also allow for extra cleaning in case the patient has not been sufficiently careful with

his diet. In a case of tuberculosis extra cleansing is necessary, anyhow. So going practically without food for several days every month is not going to weaken the patient or keep his weight down, but actually will strengthen him and stimulate the production not only of weight but of normal organic function.

By vital foods I refer to those which contain the most "life." These are the ones which have a goodly proportion of the all-important mineral elements and vitamins. A certain amount of protein, carbohydrates and fat, of course, is necessary; but those sources of these elements which also supply the minerals and vitamins will be found the most vital and effective. Vital foods are those which are in their natural state, that is, raw and unprocessed. Fruits, vegetables, milk and milk products, whole grains, nuts, and eggs are the important foods to use. Owing to its similarity to blood, to its goodly supply of vital elements, to its balance of elements, and to its ease of digestion, milk is the food *par excellence;* but it must be good raw milk.

The exact dietetic regimen which will be required in any case will depend upon the stage of the disease, the general condition of the patient, his idiosyncrasies, his mental attitude, and his changing condition from day to day. However, there is a general plan which practically always applies, and anyone with a little intelligence can adapt it to his needs. I shall give the usual plan and note variations which may be required.

The first thing to do is to take a fruit diet. This may consist of oranges alone or of oranges, grapefruit, pineapples, and grapes. In the more severe cases the juice alone is employed. But in the lighter cases the pulp also may be used; and berries, peaches, pears, plums, and apricots may be eaten in season. All the fruit must be taken raw and unsweetened. Usually as much as desired may be allowed, as the appetite is not often very keen. The fruit may be taken as three meals, or in smaller quantities at more frequent intervals. Many cases take an orange every hour for ten or twelve hours each day of the fruit diet. Reason must be used, however, and eating to repletion must be avoided. From two to four quarts of water should be taken each day, depending upon the amount of fruit taken. The water should be the purest obtainable, but this does not mean distilled water. Some hot and some cold water may be used, the proportions depending upon the desires and the reactions of the patient. In cold weather or if the patient is reduced in weight and strength, hot water often will be preferred. It should never be taken so hot that there is danger of burning, nor so cold that a chilling effect is felt. Ice-water or other iced beverages should never be used. Daily enemas are necessary while on the fruit diet, unless there is a satisfactory daily evacuation without it.

The length of this fruit diet varies from three to seven days, continuing up to seven days, whenever the patient can endure it without undue loss of

weight and strength. When resting in bed there are few who will not be able to take the diet for a week. The fruit diet is considerably easier upon most patients than is the absolute fast. The latter is not particularly needed in chronic cases. The fruit requires little digestion, and does not interfere with cleansing. On the other hand it aids in cleansing the digestive tract, and gives just enough energy material to avoid depression. Also, the minerals and vitamins supplied by the fruit are of the greatest assistance in normalizing the body chemistry and promoting metabolism.

An additional two or three days on fruit may be observed every month, though if fever persists after the first fruit diet it may be well to take up to five days on the fruit as soon as the weight and strength will permit, using the regular fruit for shorter periods thereafter. It is important that the fever be eliminated as soon as possible, because when this has been done at least the most important part of the needed cleansing has been accomplished. These fruit diets are especially helpful in bringing about this desirable condition, and this is the reason for repeating them as frequently as the condition will permit until all fever is gone.

Thereafter fruit for a few days a month or, possibly every six weeks will give the needed rest to the internal machinery.

After the fruit diet the milk and fruit diet should be adopted in most cases. The amount of milk taken will depend upon the length of the fruit diet.

In most cases it will be possible to take a glass of milk (8 ounces) every two hours during the first day, making six glasses in all. On the next day, double this quantity should be taken, or a glass every hour. Four glasses may be added each day until five or six quarts are being consumed. Some cases may have to increase more slowly, adding only two glasses per day. This is more likely to be necessary if the fruit diet is continued beyond five days, or if any difficulty is experienced in handling the milk. If fever is present after the fruit diet the quantity of milk should be limited to three quarts per day until the temperature is normal.

Ordinarily from two to six oranges per day are taken with the milk, but if only three quarts of milk are consumed a greater variety and quantity of fruit may be used, but only the acid and subacid varieties. Dates, figs, raisins, bananas and such sweet fruits should not be employed, except in very special cases. If only able to take a small quantity of milk, and constipation is severe, some figs or non-seeded raisins may be used. If diarrhea occurs, two, three or four dates may be taken with every other glass of milk. Also, in this case, the quantity of milk is limited to four quarts per day, or even less. If the proper kind of milk is secured—fresh and unpasteurized—there should be no trouble. Holstein milk is usually best, but a mixed milk may be perfectly satisfactory. Jersey milk is not satisfactory, though some cases can handle it if about one-third of the cream is removed. Usually more fruit should

be used if Jersey milk is used. Various cases may find that skim milk, buttermilk, or soured milk may agree better. See discussion of the milk diet in the chapter on treatment of acute cases.

Enemas may be necessary while on milk. However, it usually is well to reduce the quantity and temperature of the water used in the enemas until just enough cool water is employed to produce a movement. This helps to restore normal action more quickly. It is not necessary to drink water while on milk, but if there is a distinct thirst for it, it can be taken.

If the patient seems unable to handle more than a small quantity of milk or if an adequate amount of good milk cannot be obtained, the next best plan is milk during the morning and a meal at night. The milk is started the same as for a full diet after the days on fruit. When three quarts per day have been taken for two days, two quarts can be taken during the morning of the next day, finishing not later than one o'clock. Nothing should be taken in the afternoon except, possibly, some water, or an orange or two an hour after taking the last glass of milk. The evening meal will be the same as when taking solid foods. The quantity of milk used during the morning may be increased one glass per day up to three quarts, but no more is ever taken than can be handled with comfort. Two oranges in the morning before starting the milk should be sufficient fruit except what is desired with the evening meal.

A variation of this plan is two meals of milk and fruit and the evening meal of solid food. Two or three glasses of milk may be taken per meal with fruit as desired, chiefly acid and subacid fruits, but also some sweet fruit. Or, if it seems to agree better, the quantity of milk may be limited to two glasses per meal and a pint taken between the two milk meals. On this plan six glasses of milk during the morning usually are enough, though some can take eight. Various combinations of fruit may be tried, using those that agree the best. The combination of milk and fruit is always good, but some may find that certain combinations agree better than others. If buttermilk or sour milk is employed at some meal only sweet fruit should be used with it.

But let us suppose that milk is entirely unobtainable or that no adaptation of the milk diet will agree with the patient. This very seldom occurs, but sometimes is met with. In such cases the next best plan is to use raw foods. Such a diet consists of fruits, vegetables and nuts with, perhaps, some whole grain products. Eating must be resumed very gradually after the fruit diet, using nothing but fresh fruits and green vegetables for two or three days. Three meals may be taken, making one of subacid and acid fruits and the others of fruits and vegetables. All fruits agree with all fresh green vegetables, and most cases can employ any combinations of these. However, simplicity always is important, and it is well not to use more than three or four different things at a meal. Also, the quan-

tities should be small for the first few days. After this period the sweet fruits and starchy vegetables may be added, and moderate amounts of nuts and whole grain products. If milk is obtainable, from two to four glasses per day may be used, which will require that less nuts be taken. The whole grain products may be partly cooked. Plenty of water should be taken between meals. Thorough mastication must be practised, and care observed never to overeat.

For those who will not confine themselves entirely to raw foods a mixed diet of strictly natural foods may be used, though, of course, one cannot expect as good results as from milk or raw foods. Eating should be started after the fruit diet the same as suggested above. But after the few days on fresh fruits and green vegetables, other fruits and vegetables, nuts, whole grain cereals, milk and milk products, and eggs may be added. Raw foods predominate in the diet, though some cooked ones may be taken. Garlic and onions are especially good. Some garlic always should be used, even though it does not impart a pleasant odor to the breath. These two vegetables have quite an antiseptic effect. Some claim that garlic is almost a cure in itself for tuberculosis, though I cannot endorse it this strongly.

Special care will have to be observed not to mix too many things together; and the combination of acid fruit with starch of any kind should always be avoided. Other combinations that should be avoided, for one reason or another, are acid fruit

with refined sugar, cereal and sugar, nuts and eggs, and in some cases sweet milk and green vegetables. Buttermilk or clabbered milk always agrees well with the green vegetables. Meat should be avoided in most cases; and when employed it should be used in moderation and confined to fish, chicken, oysters, and broiled beefsteak, and always taken with green vegetables only, preferably uncooked. Flesh foods should not be combined with milk, eggs, cheese or nuts.

No matter which diet is used the fruit diets should be repeated, as has been previously described. When using solid foods during fever they should be limited to raw fruits and vegetables, with two egg yolks or a glass of buttermilk per day. It sometimes happens that the patient will tire of the full milk diet, even though it agrees well. In such a case one of the combination diets or the raw food diet may be employed for a time for variety. After three or four weeks, however, there should be two or three days of fruit diet and the milk diet resumed. It is very seldom that a patient will tire of the combination diets. This may occur when solid foods are used, but in this case the trouble is best corrected by taking fruit alone for a few days.

The mental attitude toward food is important, no matter what particular diet is employed. Most people regulate their diet according to what they like and dislike, regardless of the real values of the foods employed. One's likes and dislikes usually are a result of habit, and a little effort soon will de-

velop a taste for foods which are truly beneficial. After being away from the harmful ones for a time the taste for them will be lost largely or entirely, so that little difficulty will be experienced in avoiding them. Especially in a case of tuberculosis the patient should remember it is far more important to eat to live than to live to eat. When resting and there is little to do, especially in the lighter cases where the patient does not feel so badly, there is a strong tendency for the mind to dwell upon eating and a false appetite may be developed or eating will be indulged in without appetite. This should be guarded against.

One always should eat in a cheerful and happy frame of mind. If worried or emotionally disturbed to any extent in any way it would be better to skip a meal or more until the balance has been regained. If possible to eat with others who are in the proper frame of mind, and especially those who realize the importance of cheer and pleasant thoughts, it would be of the greatest assistance. Eat what your reason and special study say are best suited to you; and with these as a foundation think of the food as being life, and see that life being transformed into your life and manifesting as tissue and energy and function as may be needed. Eat with confidence that the food is going to do you good, and with thanksgiving that you have it to eat and are able to handle it. If at any time you should not be able to get the food which you know you require, eat the best foods available and do not worry. The

worry will do you more harm than occasional use of doubtful foods. Do not become neurasthenic on the subject of foods. Diet is very important, but do not allow it to obscure everything and become an obsession. Do not eat and then sit around waiting for something to happen. Eat as I have directed, chew the food well (even milk), eat in moderation and with simplicity, and then, having eaten, forget about that meal.

RAW FOOD MENUS

BREAKFAST:	LUNCH:	DINNER:
Monday		
Oranges	Apples	Lettuce and carrot salad
Pineapple	Dates	Almonds
	Milk	Radishes
		Figs
		Hot water with cream and honey
Tuesday		
Flaked wheat	Lettuce and tomato	Celery and onions
Raisins	Buttermilk	Ripe olives
Milk	Dates	Apple
		Banana and cocoanut
Wednesday		
Grapefruit	Spinach	Combination salad with garlic
Dates	Carrots	
Walnuts	Prunes (Soaked)	Cottage cheese or pignolia nuts
		Raisins
		Cereal coffee
Thursday		
Oranges	Pecans	Cabbage salad
Bananas	Apple	Ripe olives
Whipped cream	Celery	Chopped beets
		Prune-whip
Friday		
Rolled oats	2 egg yolks in orange juice	Lettuce and cucumber
Figs		Radishes
Milk	Celery	Walnuts
	Dates	Grated turnip
		Hot water with cream and honey

Saturday		
Peaches	Combination salad	Celery and onions
Pears	with garlic	Pecans
Cocoanut	Buttermilk	Carrots
	Dates	Raisins
Sunday		
Bananas	Spinach	Lettuce and tomato salad
Apricots	Beets	Cauliflower
	Prunes (soaked)	Walnuts
		Figs
		Gelatine with cream
		Vegex or Savita "tea."

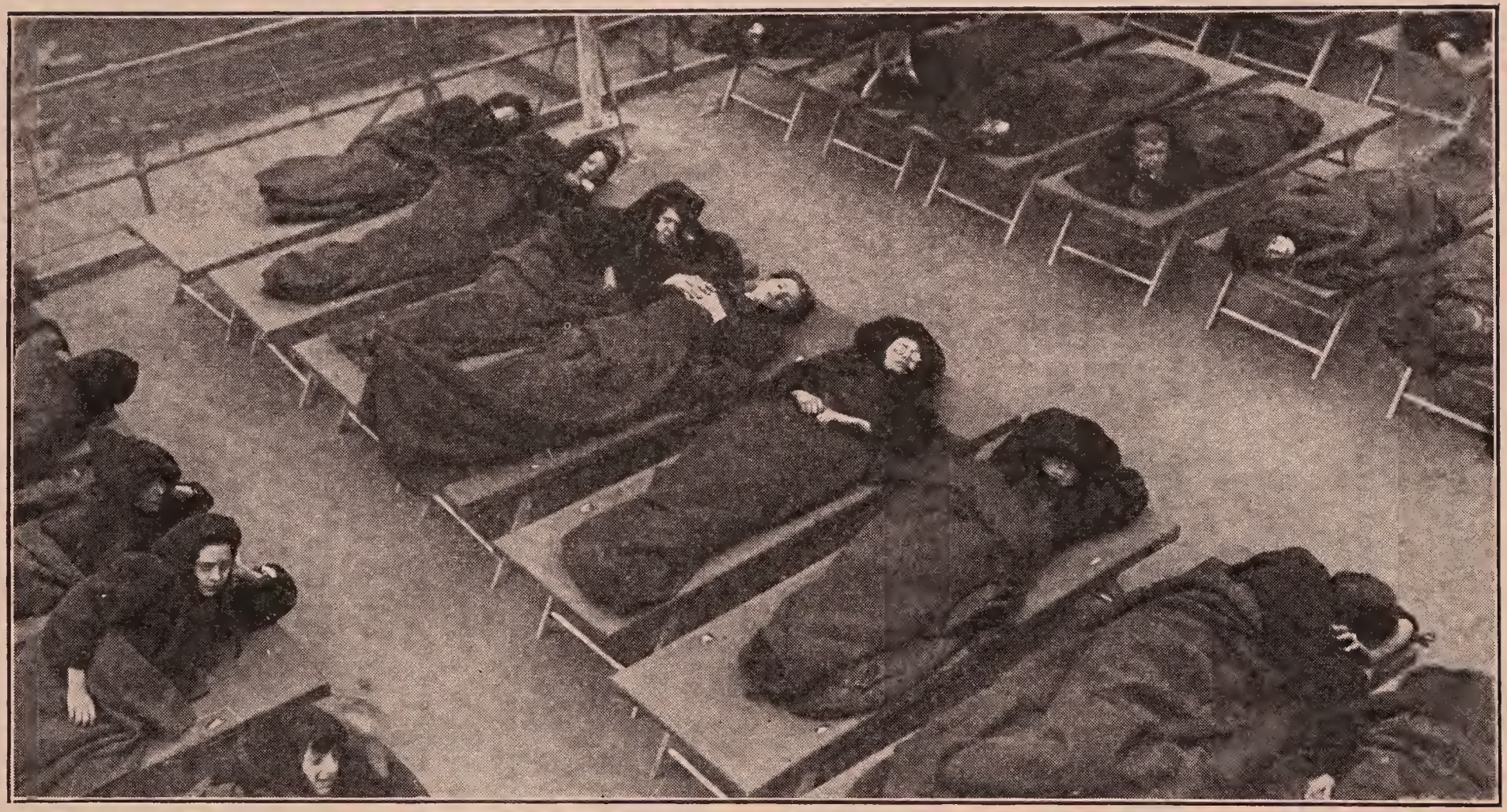
MIXED DIET MENUS

BREAKFAST:	LUNCH:	DINNER:
Monday		
Oranges	Combination salad	Tomato soup
Raisins	Buttermilk with	Green beans
Milk	cream	Lettuce and onion salad
		Whole wheat bread and butter
		Prunes
Tuesday		
Shredded Wheat	2 egg yolks in	Fresh corn
Honey	orange juice	Cold slaw (no vinegar)
Milk and cream	Celery	Ripe olives
	Dates	Rye krisp and butter
		Cereal coffee
Wednesday		
Steel cut oatmeal (cooked five minutes)	Vegetable soup	Fresh fish
	Whole wheat zwei-	Lettuce with chopped onion
	bach and butter	Spinach
Raisins	Gelatine	Peaches
Milk and cream		
Thursday		
Whole Grain Wheat	Apple, celery and nut salad	Baked potato
		Kale
Honey	Grated carrots	Hearts of lettuce
Milk	Prunes with whipped cream	Cottage cheese
		Cereal coffee or Vegex
Friday		
Baked apple with cream	Combination salad	Potato soup
	Whole wheat bread and butter	Cauliflower
Shredded Wheat		Cold slaw (no vinegar)
Honey	Banana and cocoa-	Ripe Olives
Milk	nut	Whole wheat raisin bread with honey

Saturday		2 poached eggs
Peaches	Sauerkraut (raw)	Green beans
Pears		Celery and onions
Walnuts		Whole wheat zweibach and butter
		Fig pudding
Sunday		
Grapes	Vegetable soup	Roast chicken
Dates	Corn muffins and butter	Spinach
Milk		Lettuce, cabbage and garlic salad
	Prunes	Apricots

AIR

Air well might be included in the subject of diet, for it distinctly is a food. But the function of breathing, in which air is utilized, is more than a process of digestion and assimilation, being also a process of elimination. Air, therefore, is doubly important; and the proper kind must be secured day and night in cases of tuberculosis. The proper kind of air has been the subject of great controversy. The only point upon which all are agreed is purity, and that really is the fundamental one. If one secures pure air and plenty of it there need be no energy wasted in worrying about whether it is moist or dry, hot or cold, rarefied or otherwise. For instance cool air generally is considered the best; but I know of several cases which were greatly benefited by the hot dry air of the desert. Of course, these factors do have some effect, and patients may do better in one climate than another and different patients seem to do better in different climates. But when the right treatment in general is being used I am sure that there are few who cannot get well



Resting and sleeping out of doors in cold weather. When well wrapped up the patients can endure a very low temperature. If it is very cold, however, the hands should be kept under the covers or should be protected with mittens.

in any climate so long as plenty of pure fresh air is secured.

By pure air I mean air which is not contaminated with dust or other foreign material or with gases and noxious vapors. The air in the pine woods generally is considered the purest; but almost any place in the country will be satisfactory. The more densely populated a place the more will the air be contaminated, especially in cold weather when many fires are going and giving rise to wood smoke, coal gas, and other fumes. However, in sparsely populated districts the other conveniences for treatment are not so readily available, and a compromise often is necessary. There is no perfect climate, and I know of no place which furnishes a perfect environment for tuberculous patients. Hence, a certain amount of compromise always is necessary. And perhaps this is well, for if things were too easy for the patient he might not develop the necessary will power and wisdom to keep well after regaining his health. All obstacles have or can be made to have their uses. There are few climates so bad or few environments so unfavorable that the patient cannot get well if he employs the right treatment with determination and confidence.

Outdoor living is always the best; but many patients will not be in a position to live in the open. For these there are many methods by which the outdoors may be brought indoors, so to speak. Here I wish to tell you how to utilize the air once you have secured it. The orthodox treatment is unalterably

opposed to deep breathing exercises in the great majority of cases, yet some people have recovered with very little treatment except deep breathing. Our physician friends emphasize the importance of rest for the lungs as well as for the rest of the body. The danger of rupturing the diseased lung tissues looms large in their minds. Some would stop the patient from breathing if that were possible,—and in extreme cases they do try to do just this, to a certain extent, by putting the patient's chest in splints or a straitjacket and in other cases by collapsing an affected lung. As always, however, extremes are seldom advisable. There is a middle course to follow which, while it may not give the maximum benefit to those cases which could stand extensive deep breathing, will do no harm to those who are not in a condition to stand much. One thing is certain, to supply fresh air and then not use it is pure foolishness and no way to make progress.

Having procured the air the next thing is to get it not only into the lungs but into the blood stream. It will be drawn into the lungs even with ordinary breathing; but before the essential elements can enter the blood stream there must be an interchange of gases through the air-cell walls and the blood-vessel walls. This takes a little time and is governed somewhat by the air pressure. If the air can be kept in the lungs a little longer than usual and under a slight pressure there will be a more perfect interchange of gases and, in consequence, better results will be secured. Merely taking deep breaths is not

entirely satisfactory. While it will ventilate the lungs it will not have great effect upon the blood stream. Moreover, there is some danger of tearing the diseased lung tissue and opening up tubercles through strain and unusual expansion of the parts, especially if there is a tendency to hemorrhage.

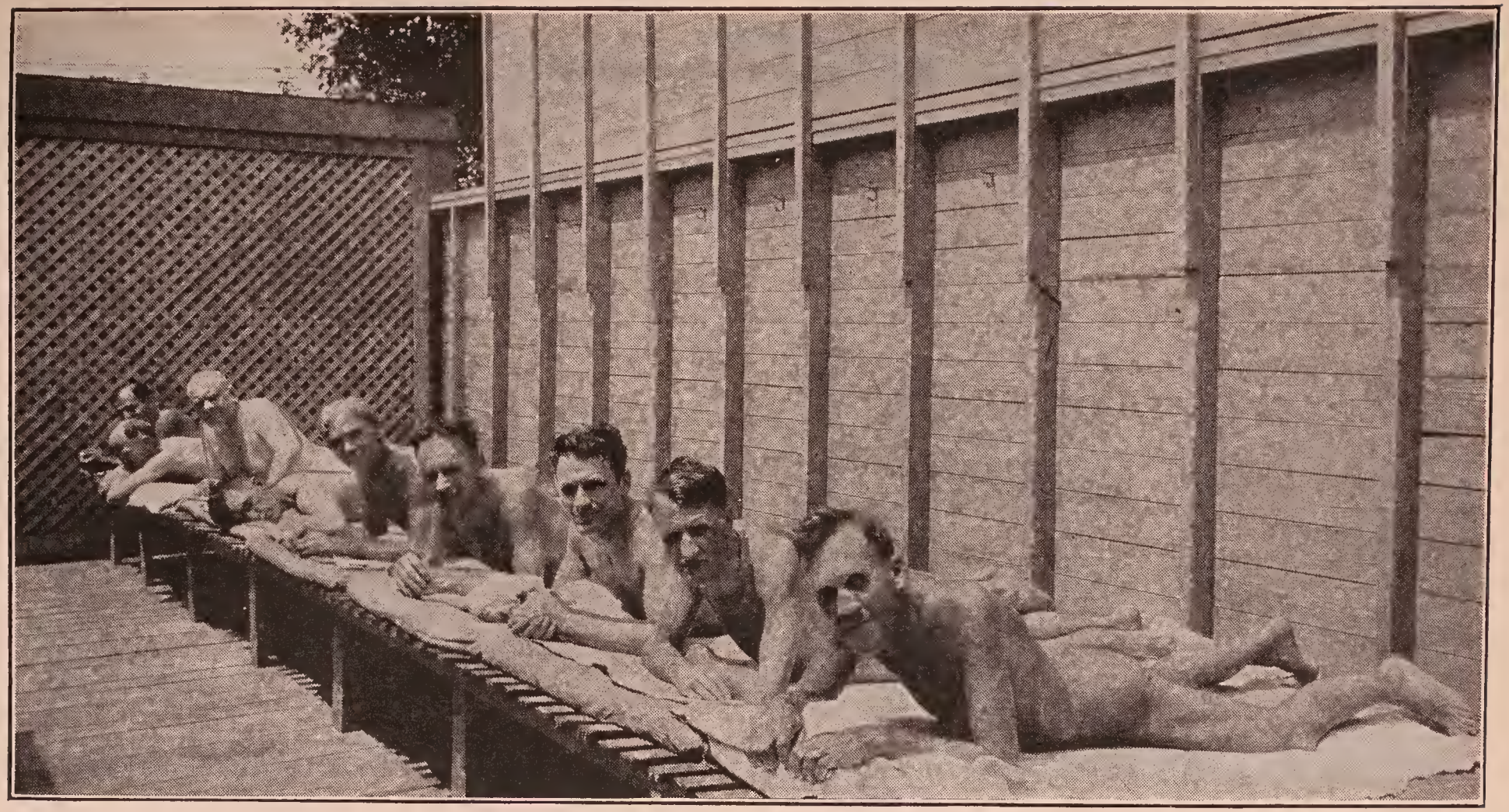
The thing to do is to take a moderately deep breath, hold it for a few seconds and then let it out. This gets enough air into the lungs to reach all the air cells and keeps it in long enough to allow a free interchange of gases. The exact rhythm of this breathing will vary in individual cases. As a rule one should inhale for four or five heart beats, hold the breath for two, and exhale for four or five. The heart beats may be counted by placing the middle finger on the pulse at the wrist until one learns the pulse rate through practise. The length of time for each part of the breath may be gradually increased until the inhalation takes seven beats, the retention four, and the exhalation seven. One of these breaths should be taken every hour during the day for three days, then two every hour, then three, and so on up to five. This number is continued for two weeks when it again may be gradually increased five more—up to ten. When able to take some muscular exercise the voluntary deep breathing need be taken only every two hours.

It is well to use the power of thought along with breathing, as with eating. Think of the air as being manifested life which you are drawing into your tissues where it may manifest as perfect cells and

perfect function. As you breathe in, visualize energy flowing into you; as you breath out, visualize all the impurities flowing out of the body. Such conscious breathing will do wonders in cleansing and rejuvenating every tissue. Whatever else you do, do not neglect your breathing. Air is life to the tuberculous person, and *it must be secured.*

SUNLIGHT

In many respects, sunlight is almost as important as air. We do not fully realize its importance because we always get a certain amount of it. If we were to be confined in a dungeon with little or no light we soon would begin to realize what part the sun plays in our existence. However, it is the direct unobstructed rays which are the most beneficial and helpful. Most people get little or none of these rays because all wear clothing and live indoors a large part of the time. Dr. J. A. Kiernan, of the United States Department of Agriculture, says that tuberculosis affects cattle in proportion as they live in the dark and under cover. If this is true for cattle, why not for human beings? As a matter of fact, there is no doubt that it is true in regard to humans, the facts being borne out by the observation of the larger number of cases among poor people who live in dark, crowded quarters. But I have already given sufficient evidence of the importance of sunlight in the chapter on causes of tuberculosis and need not repeat here. I also have told, in the chapter on treatment of acute cases,



The natural sun bath. Note that the entire body is exposed. In cases of tuberculosis it is well to start with the legs only but as soon as the condition permits every square inch of skin should receive the benefit of the healing rays of the sun.

how to take the sun baths. In the chapter on equipment I shall tell about various methods of getting the sun bath when one cannot simply go outdoors and lie down naked in a nice sunny spot.

One point I wish to bring out here, however, is the matter of clothing. Of course, when the patient is in bed this is not of so much importance; but even under these circumstances the less clothing worn the better. If the climate permits, the patient should remain naked. All bed clothing should be as light as is consistent with warmth, and also should be light in color. White and orange are the best colors for all bodily coverings, as they permit the most light to pass through. White is the complete color and orange is the color of health. When there is fever light blue would be a good color, as it is cooling and soothing. The clothing should be loosely woven, as more of the rays can pass through the meshes. For this reason silk is not as good material as cotton or wool fabrics. Linen often is best of all. In cold weather the underclothing should be practically as light as in summer, adding more and heavier outer garments as may be required when going outside for walks, porch rest, or for any other purpose. These can be removed readily in accordance with the inside temperature. Moreover, several light coverings are warmer than one heavy one. As most people are rather limited as to the amount of sunlight they can get on their skin, it is very important to wear the proper clothing in order that the deficiency may be made up as far as possible. Once

or twice a day all the clothing should be removed in order that the light and air may reach the skin. The only time this is not necessary is when the patient is able to take sun baths regularly every day. The ultra-violet rays are a good substitute for the sun bath; but when neither can be obtained the air bath will give some of the desired results.

It is greatly to be desired that either the sun bath or the ultra-violet radiations be secured by every patient until he is well on the road to recovery, and even for an indefinite time thereafter. The better blood, more energy, and greater resistance conferred by the sunlight are of the greatest possible assistance in recovery and eventually in establishing a complete cure.

WATER

Water is the most universal solvent, hence very important for cleansing. Since the body is three-fourths water, water also is highly necessary in the formation of the tissues. Not only that, but it is the most convenient carrier for heat or cold, being capable of altering to all temperatures from freezing to over 212 degrees. The latter is the boiling point, but steam is even hotter than boiling water while still being a form of water. Ice and salt will give a temperature below freezing. Water is capable of a wide usage, and is most important to the tuberculous patient.

The first use for water that naturally occurs to a person is that of drinking. Consuming consider-

able quantities of water while on the fruit diet will be of the greatest assistance in cleansing the alimentary tract, diluting toxins, and hastening their elimination through the kidneys and skin. All this removes the fundamental cause of tuberculosis (toxemia), and fever is reduced and all symptoms ameliorated. A glass of water an hour should be used, and even more may be taken. If there is difficulty in taking a full glass at a time a smaller quantity may be used, repeating the dose more frequently. Either hot or cold water or both may be employed, according to conditions and the desires. Hot water is heating and slightly more cleansing. Cool water generally is best when there is fever and for general purposes, since it is the natural temperature at which to take it. Ice-cold water should not be employed, even in very warm weather or high fever.

The water should be the purest and best obtainable. If the local water is very hard it may be well to dilute it with distilled water. It is never advisable to use all distilled water. Special spring waters generally are very good, though not the nauseous, saline, iron, and sulphur waters. Use those brands which taste simply like "good water." The proper kind of water is odorless, clean and sparkling. Boiling may be resorted to if the purity of the water is doubtful, after which it should be strained through a cloth and aerated by pouring back and forth from one vessel to another. While on the milk diet water need be taken only if there is a special desire for it, since the milk itself contains an abundance of water

—87 per cent. When on solid food the usual quantity of water consumed is six or eight glasses a day, taking it between meals. If there is definite thirst during meals a small amount of water may be taken at such times.

Another use for water as an internal cleanser is the water injection into the bowels known as the enema. The high enema generally is employed on the first day of the fruit diet, then the ordinary enema daily thereafter until the bowels move naturally and regularly after starting the milk or solid food diet. After the fruit diet, however, the quantity and temperature of the water employed should be gradually reduced. It is not well to make a habit of taking the enema; but it should be employed whenever necessary, and this may be fairly regularly while the patient is confined to bed. When able to be up and around and do a little walking the activity will help greatly in keeping the bowels regular. If the bowels move of themselves but with difficulty it usually is best to use a small quantity of cool water as an enema. Straining at stool never is advisable, and particularly is to be avoided when there is a tendency to hemorrhage.

It is extremely important that there be at least two bowel movements daily and three daily evacuations are still better. A regular time should be observed as nearly as possible. Occasionally it may happen that in severe cases of constipation the plain water enema will not be fully effective. In such a case a tablespoonful of salt may be added to each

quart of water. Epsom salts in the water sometimes is more effective than the ordinary salt. In getting the water out after injections, deep breathing and abdominal massage are very helpful. In the majority of cases there is not likely to be any special difficulty. Usually an enema of plain warm water will be readily taken and eliminated and prove fully satisfactory. Cool water often is ejected more easily and promptly than warm water. In any case, except of marked weakness, it is better to follow all warm enemas by small cool injections, these to be discharged immediately as were the warm enemas.

The external application of water, as well as its internal use, is of value. We all know that it is necessary to keep clean; but there are other reasons for the external application of water. By the application of water at different temperatures we can heat or cool the body, stimulate or depress its functions, and control circulation. A thorough study of hydrotherapy in all its branches will show that practically all the actions of the body can be controlled through the use of water. Such absolute control is not always advisable, however. If a certain condition is present in the body it usually is because that condition is necessary, and to change that condition without removing causes will result only in further trouble. Also, the arbitrary changing of conditions uses up energy. However, if causes are being removed and intelligence is employed in applying the water so as to exercise just enough control and not consume too much energy

water will be found of great assistance. In a case of tuberculosis energy must be conserved, since the patient is not in a position to build much for some time; hence, treatments of all kinds which consume energy should be kept at a minimum. Massage, enemas, baths, compresses, etc., all take energy and are to be used only when necessary. The sun bath *confers* energy; but even this important procedure can be carried to excess.

In all cases of tuberculosis the daily tepid bath should be taken for cleanliness and refreshment. One or two warm baths with soap may be taken each week for additional cleanliness, especially if there is much sweating. The water should be just warm enough to be comfortable. Hot baths seldom if ever are given, except in the lighter cases when sun baths cannot be obtained and some additional skin elimination is desirable. When sun baths are used a cool sponge should be taken afterward, this being the only water bath employed that day. If fever goes above 103 degrees, a cool sponge may be given. Of course, in such a case the sun baths will not be used.

The local application of packs and compresses may be used to ameliorate symptoms when they become severe. This necessity arises only in chronic cases when complications develop, such as hemorrhage, pleurisy, colds, insomnia, etc.

EXERCISE

While rest is very important in the treatment of tuberculosis, there comes a time when exercise is

not only permissible but necessary. To many orthodox practitioners exercise in tuberculosis includes nothing but walking; but there are other forms that also have their place and uses. Walking is the most valuable, without doubt; and many can do well with this alone until a fully normal condition has been restored. There has been much controversy as to the value of exercise for tuberculous patients. There was a time when the doctors recommended "roughing it." A frequent prescription was, "Go out West and live on a ranch." This "worked" in some cases, while others were made worse. Hence, at present there is a stronger and stronger trend toward the advice of rest and more rest. But the fact that activity proved beneficial in some cases indicates that there must be some value in it. It is simply a question of suiting the activity to the patient's condition. Violent exercise, such as rowing and running races, have been advised in the past. Many times there seems to be an unusual "muscular intelligence" in tuberculosis, and tuberculous young men often are superior athletes—for a time, as many others have an unusually clear, perhaps brilliant mentality. But such activity is to be condemned. It cannot fail to hasten the course of tuberculosis.

I would not have any of my readers reach the point where they are afraid to make a move. This often occurs when patients are taking the orthodox "cure." They are especially impressed with the danger of moving the arms. They require to be waited

on hand and foot, and would not think of lifting so much as a heavy book. They never seem to reach the point, however, where they will not use their arms to feed themselves. It may be well for women with long heavy hair (rare in these days of the "bob") to avoid combing it themselves; but all ordinary movements are quite permissible. Of course, the more progress the patient has made the greater amount of activity will be permitted. The important points are to avoid sudden violent exertions, strain, or activity prolonged to the point of well marked fatigue. When there is any doubt about the amount and degree of exercise to employ it is safest to rest or use an insignificant amount and degree unless the patient can secure expert advice. However, one should not use this statement as an excuse for doing nothing. One always should take as much exercise as is felt to be safe.

As I have stated before, it is always well to take about two weeks of rest at the start of treatment, even in the lightest cases. If there is fever, rest should be secured until several weeks after all fever has subsided. The temperatures governing this are as follows: 97.8 degrees at 7.00; 98.6 at 4.00; and 98.2 at 8.00 to 9.30. If the temperatures exceed the figures given at the designated hours some fever may be assumed to be present. Much less trouble will be experienced with this symptom when taking the dietetic regimen I have advised. Fever is most persistent when following the orthodox method of overfeeding.

When ready to get up from the rest bed, couch or chair, the same plan may be followed that I have given in the chapter on acute cases and in this chapter under the discussion of rest. The first "Exercise" I would advise is the daily morning tepid (about 86 degrees) bath, soon changed to cool (about 68 degrees), and finally to cold (50 degrees or lower)—each to be followed by brisk rubbing to bring a glow to the skin. This is an admirable exercise for lungs, heart, circulation, skin, muscles. When ready for regular walking out of doors the following plan is excellent: A five-minute walk daily on the first three days. This may not seem to be very much, but at ordinary speed it amounts to a quarter of a mile. Many a well person will reckon for ten minutes how many times he can change cars to avoid such a walk. It is best to regulate the walking by time rather than by distance, on account of the varying speeds that will be used. The patients who have not been so bad and in bed only a short time can walk at regular speed. Those who have had more serious cases and have been quite weakened will have to walk slowly. The patient usually can judge his own speed best. A fairly level place should be selected and used until twenty-minute walks are being taken. If necessary, one may walk back and forth if the level spaces are limited.

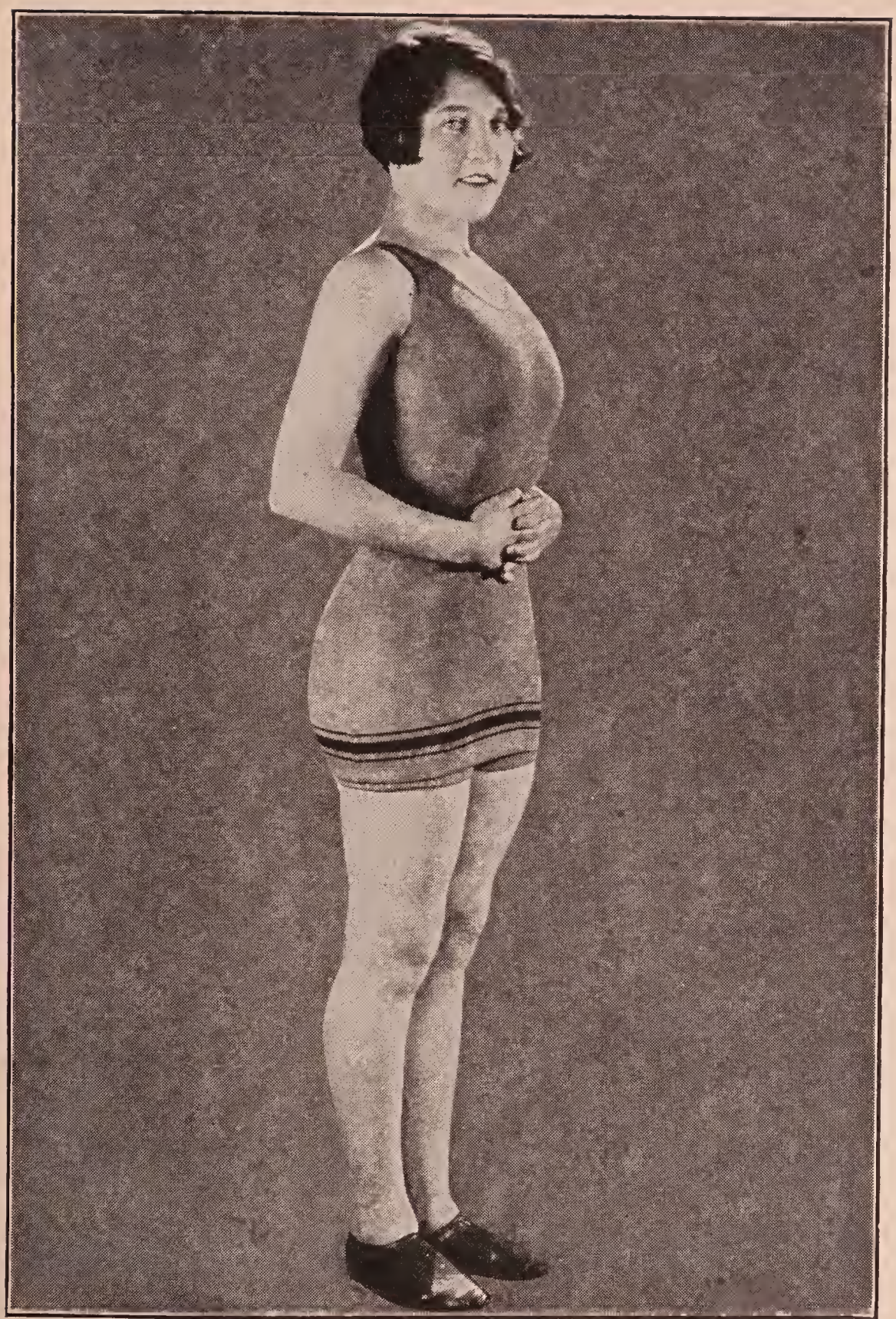
On the fourth day the walking time may be lengthened to seven minutes, and on the seventh day to ten minutes. On the tenth and following days

fifteen minutes may be spent in walking, and at the end of two weeks twenty minutes. This time should be adhered to for a week, when the distance again may be increased, five minutes per week until the walks are for one hour daily. When this has been done for two weeks a second daily walking period may be started, following the same plan as for the first one. At this time the longest period should be taken in the morning, the shorter in the afternoon. Of course they ultimately will become equal. Two hours of walking daily should be the maximum. If able to indulge in more activity than this it may be in the form of regular exercise.

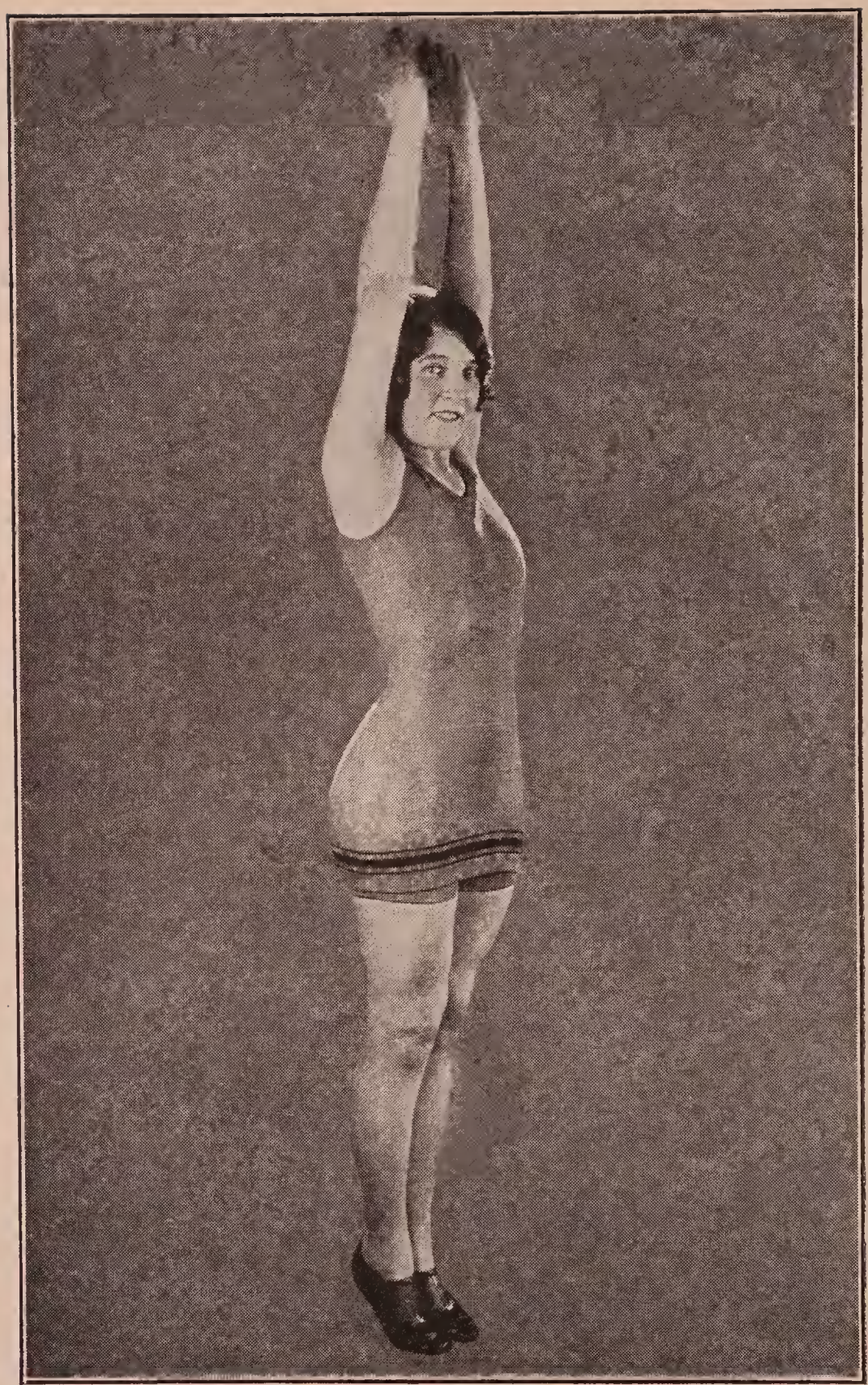
When able to take twenty minutes or more of walking, moderate hills may be selected, and as the condition further improves hills of steeper grade may be chosen. It is well to walk up hill at the start of the walk and down hill at the finish of the walk. It will be necessary to go slowly at first when climbing, as the breathing should not be greatly hurried. The amount of exertion required when walking varies with the speed, swing of the arms, amount of clothing, character of the ground, etc., and there are many gradations. Some can increase the exertion more rapidly than here suggested, and some will have to go more slowly. As a rule it is well to "make haste slowly." If the patient is at all reasonable he will be able to judge for himself just what he can and cannot do safely. If too much is done on any day it may be well to rest a day before continuing with the regular schedule. Indications of

over-activity are hastened pulse, palpitation of the heart, sweating, rise of temperature, weakness, discomfort in the chest, and headache. If increased heart action is the only symptom noticed the safety limit has not been overstepped. It is seldom that any difficulty will be experienced, as walking is such a rhythmic and natural exercise that one has to go considerably beyond the amount that would be proper before any noticeable harm will be done. When living rightly in other respects there is much less danger from over-exertion than when following conventional diet and treatment.

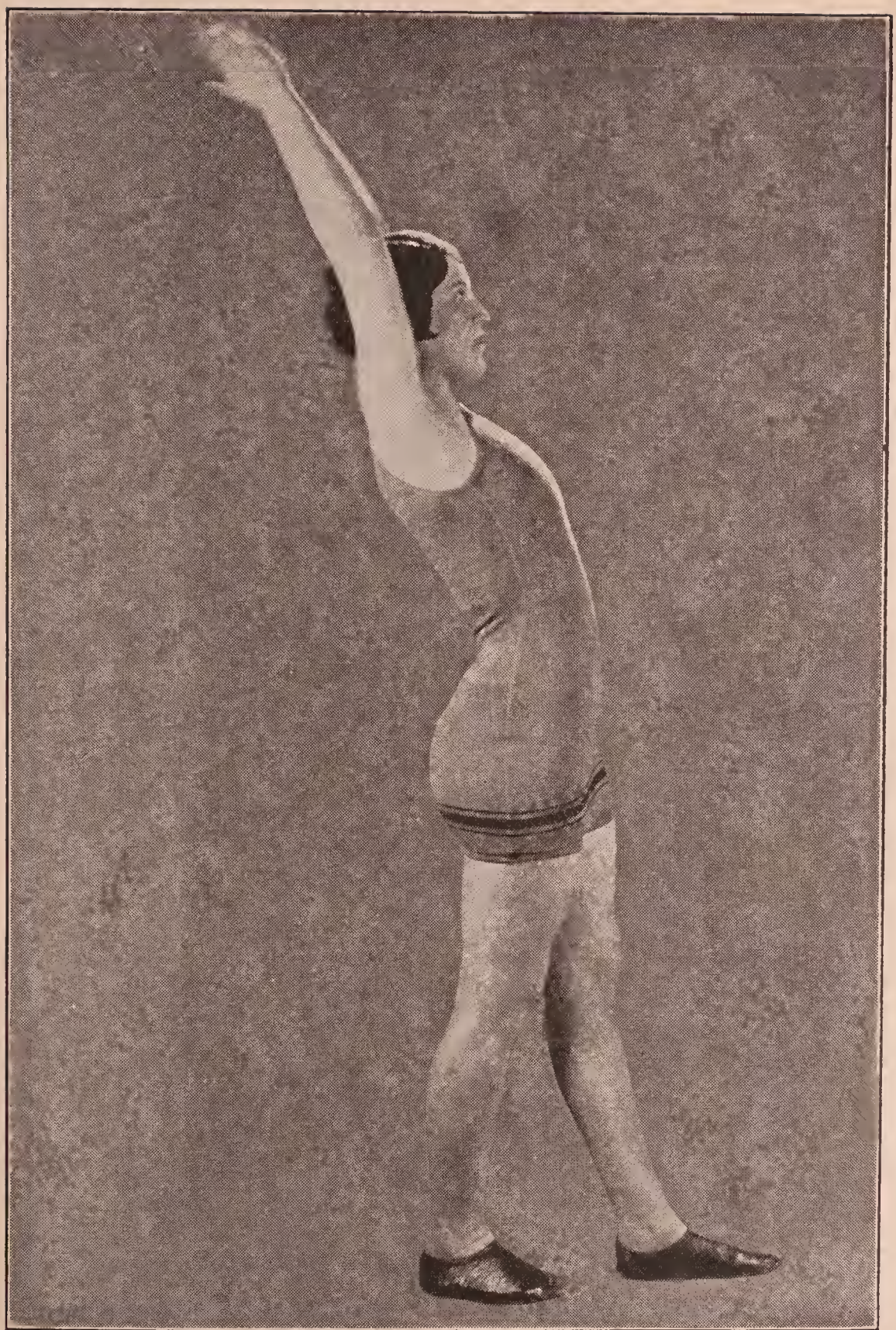
The exercises that can be used in addition to walking are mild stretching and simple free-hand movements taken in a reclining position. For instance, in the reclining face-up position, raise and lower the head; cross the arms over the chest; flex and extend the arms; flex and extend the legs; raise and lower the legs one at a time; and with knees drawn up so that the feet are close to the buttocks, slightly raise the hips and lower again to position. Rolling from side to side also may be used. In the face-down position raise and lower the legs, and raise and lower the head and shoulders. These exercises seldom are advisable until the patient is able to take at least an hour's walk daily. In some cases they may be used instead of walking when the weather is so bad that the patient cannot get out. For instance, in the colder climates, the snow may be quite deep in winter, and this would greatly increase the exertion of walking, especially when tak-



Stand as shown. Inhale deeply; exhale by pressing on abdomen, keeping chest fully elevated. Repeat five times; rest. Also start same position but inhale by pushing out abdomen, keeping chest flat. Repeat. Later learn to do both with arms at sides.

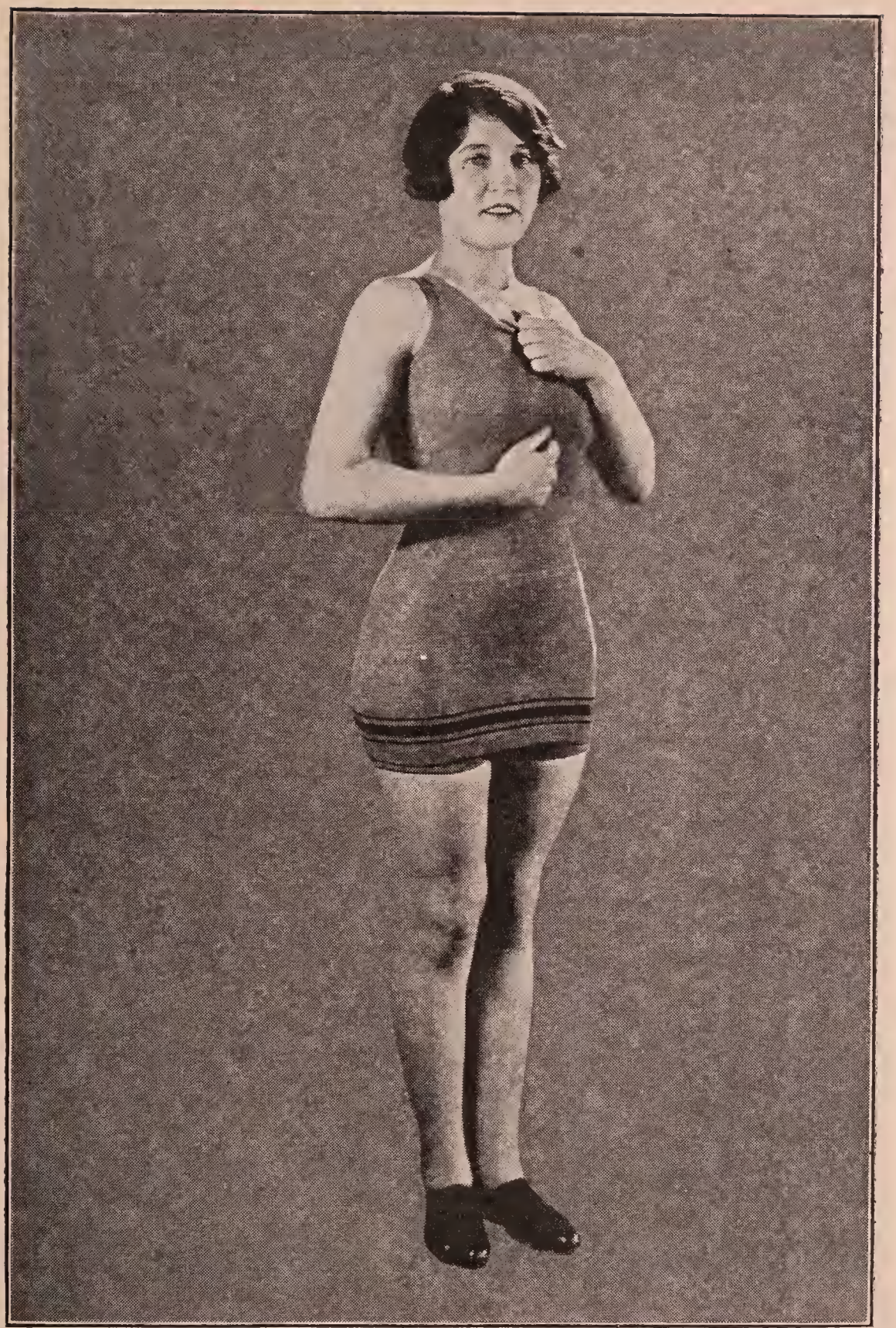


Stand with arms at sides. Raise both arms forward upward until vertical, inhaling. Hold the breath, stretch upward, rising on tiptoes. Lower arms sideward backward, palms up, pulling backward and exhaling. Repeat five a minute for twenty times.



Stand erect, arms down, feet together. Extend left foot forward at same time raising arms forward upward until vertical, inhaling deeply. Bend slightly backward. Lower arms sideward, exhaling, replacing foot. Alternate with feet, fifteen to twenty times.

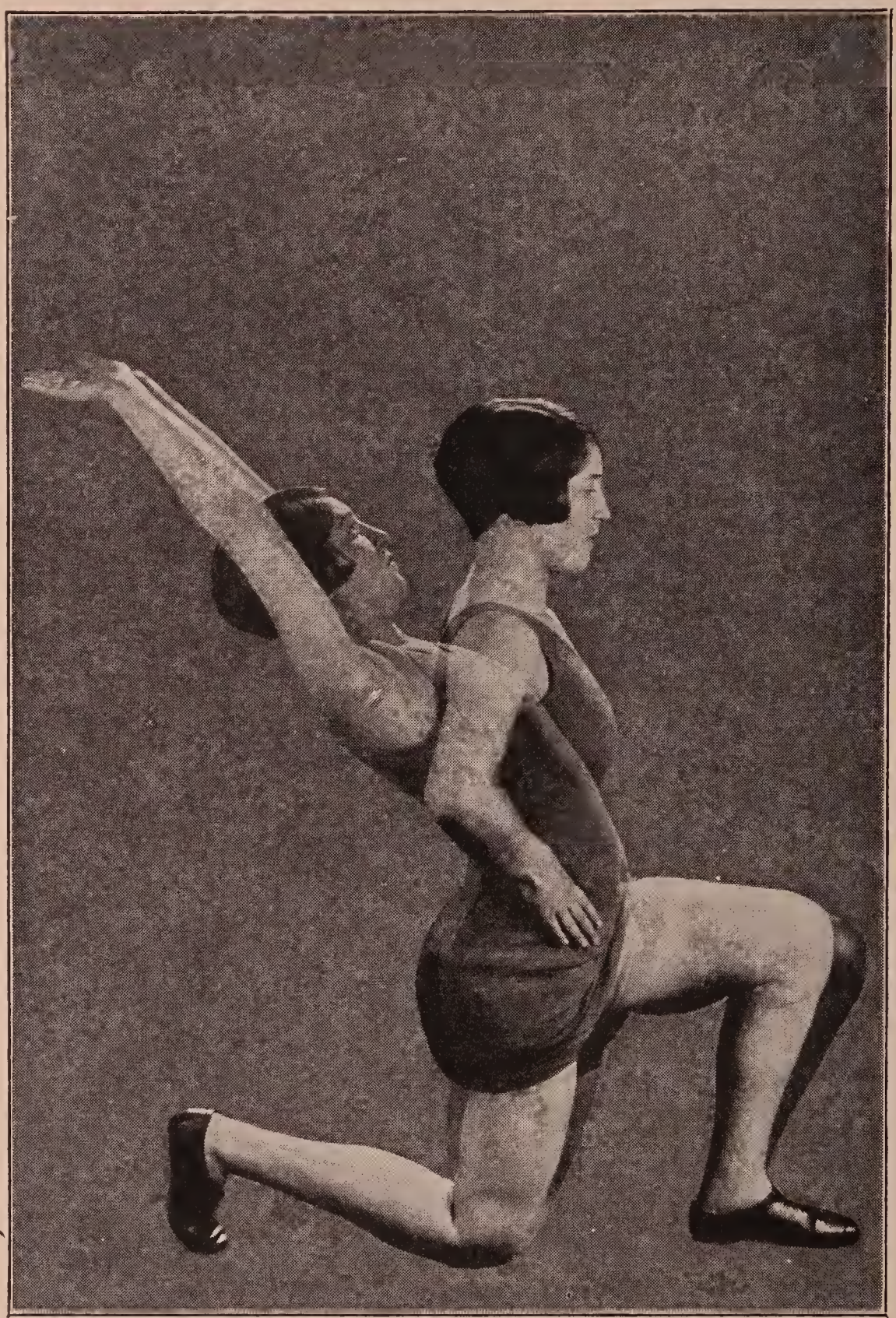
Stand erect but with arms forward, palms together. Swing both arms outward backward, inhaling. Turn palms outward at start of movement. Bring arms forward, exhaling. Bending slightly forward on inhaling movement improves the movement.



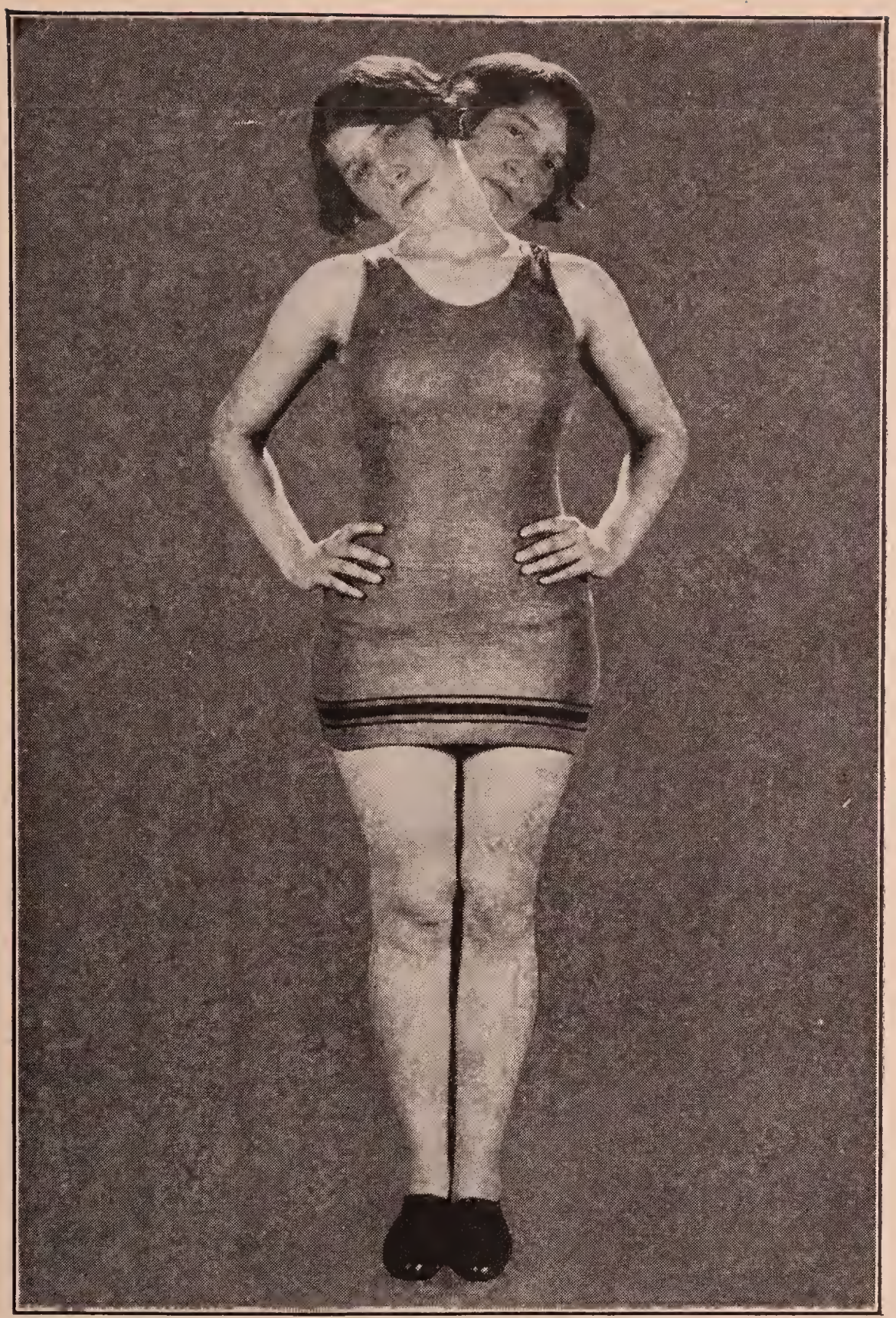
This is a friction-resistance-breathing exercise. Stand in position shown. Press firmly with hands and wrists and move them to and fro across the body while inhaling deeply, then while exhaling. Pause between inhaling and exhaling. Rest and repeat.

Stand erect, holding a wand or slender stick across the thighs in front. Raise wand to overhead, inhaling; increase depth of breath while lowering wand to shoulders as shown. Exhale as wand is raised to vertical and brought down to starting position. Repeat.

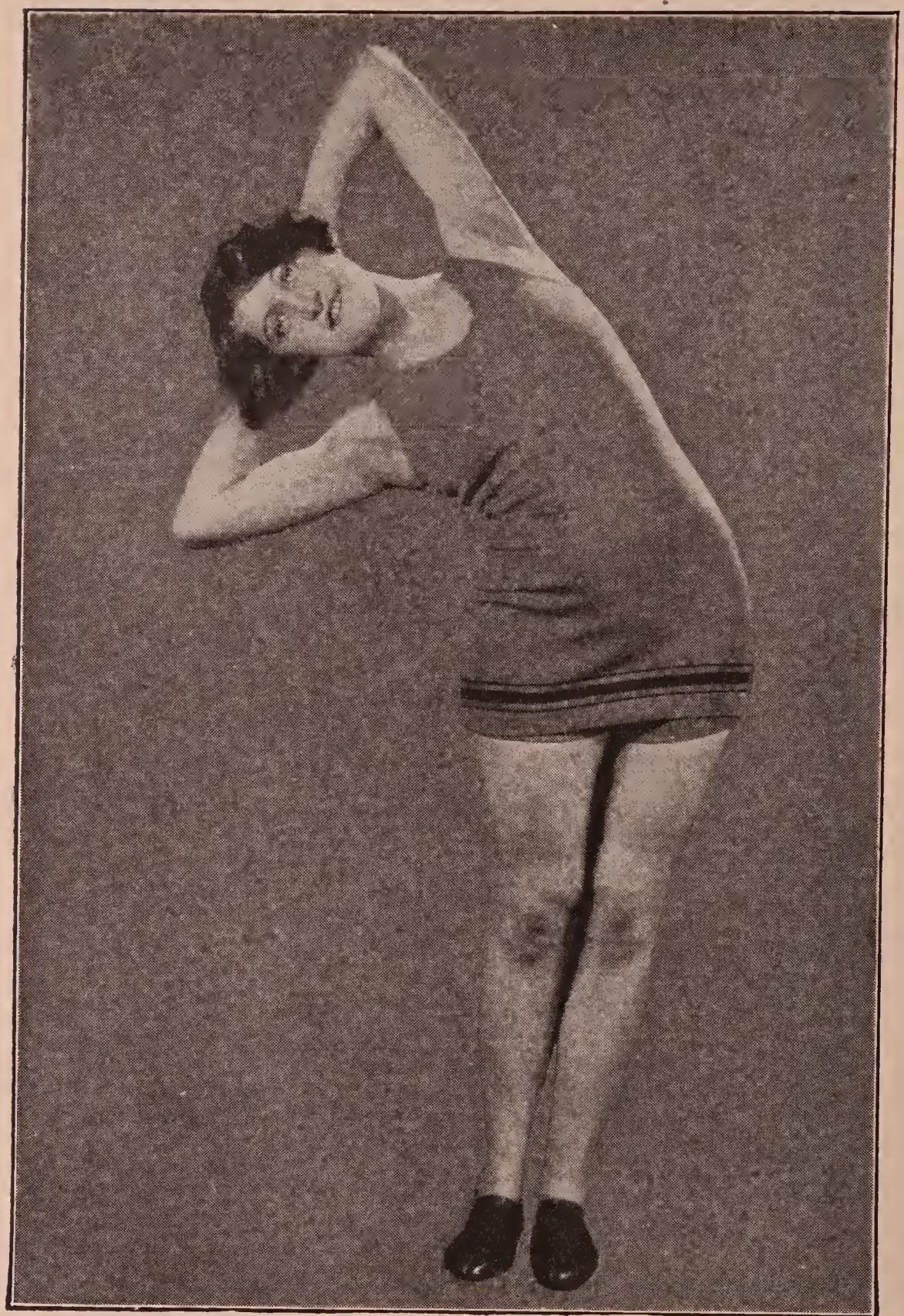
Stand erect, arms at sides. Inhale deeply, then bend down slowly and fully exhale. Now come to erect, bringing arms forward upward overhead, letting them go outward backward, palms up, inhaling deeply. Bend forward, exhaling, and repeat.



Rest weight on one knee and the other foot, hands on hips. Bring arms forward upward backward, inhaling deeply. Come to erect and return hands to hips, exhaling. Repeat. Then reverse positions of feet and knees and repeat.

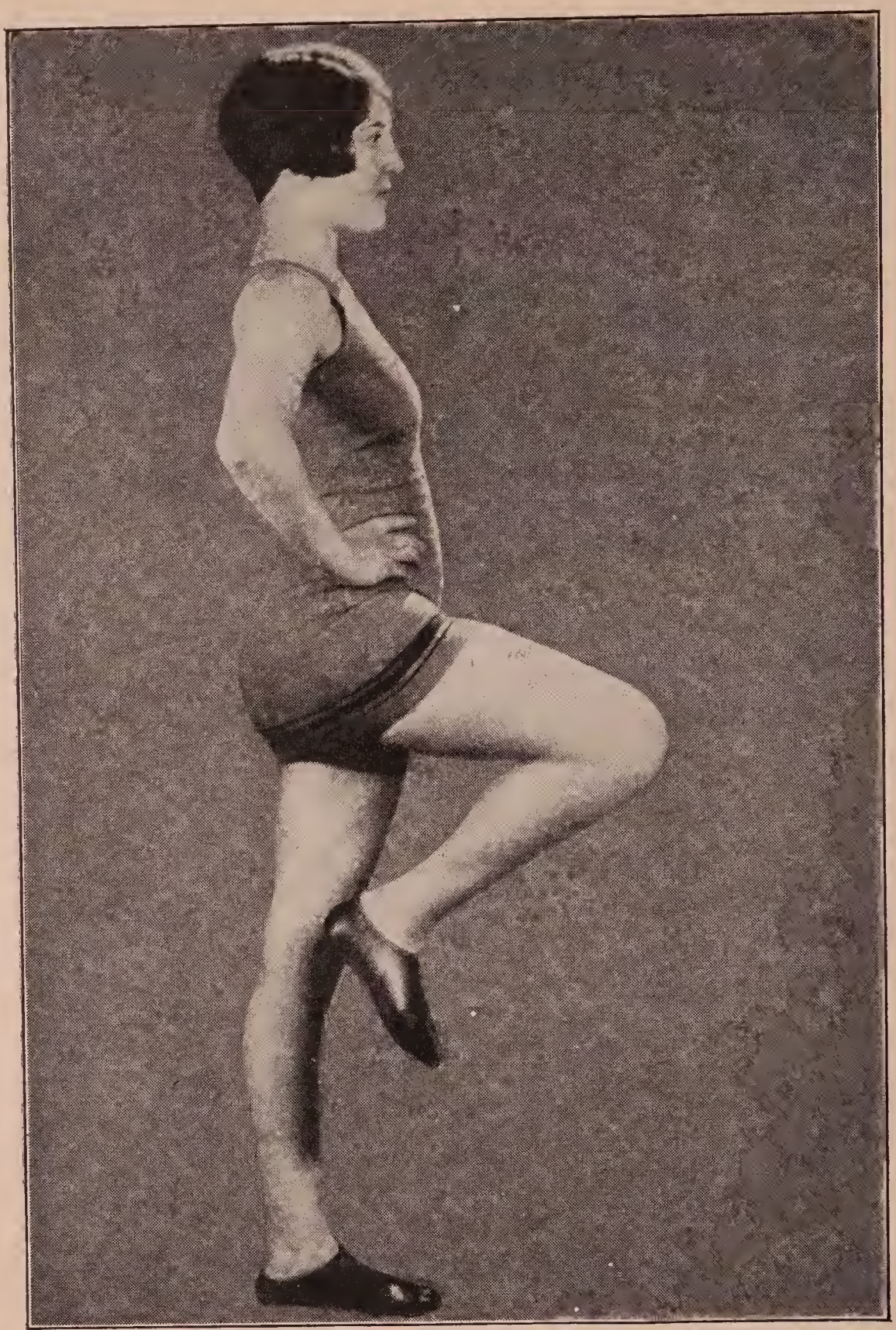


Stand erect, hands on hips. Bend the head sidewise as far as possible, right and left. Then bend head forward and backward as far as possible. Then rotate head right and left, looking over shoulders. Breathe slowly, deeply and rhythmically.



Stand erect, hands locked behind head (or neck). Bend right slowly, inhaling deeply, stretching the left side of chest and expanding it fully. Come to erect, exhaling; then bend left, stretching right side of chest. Continue alternating right and left.

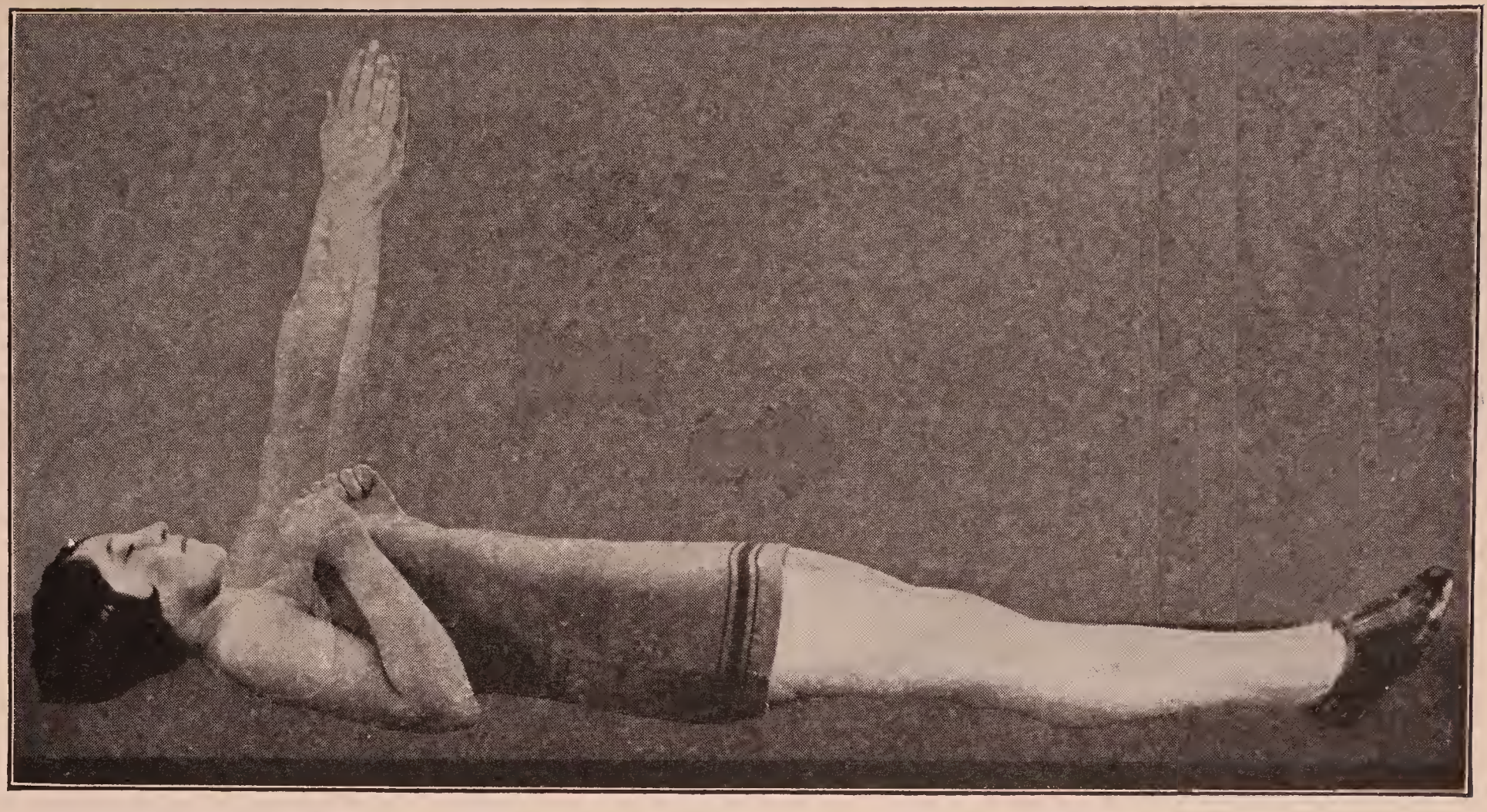
Stand erect, left hand on hip, right arm down. Bring right arm outward upward to overhead and bend left, inhaling and stretching right side of chest. Press into side with left hand. Return to erect, lowering right arm, exhaling. Repeat, then reverse and repeat.



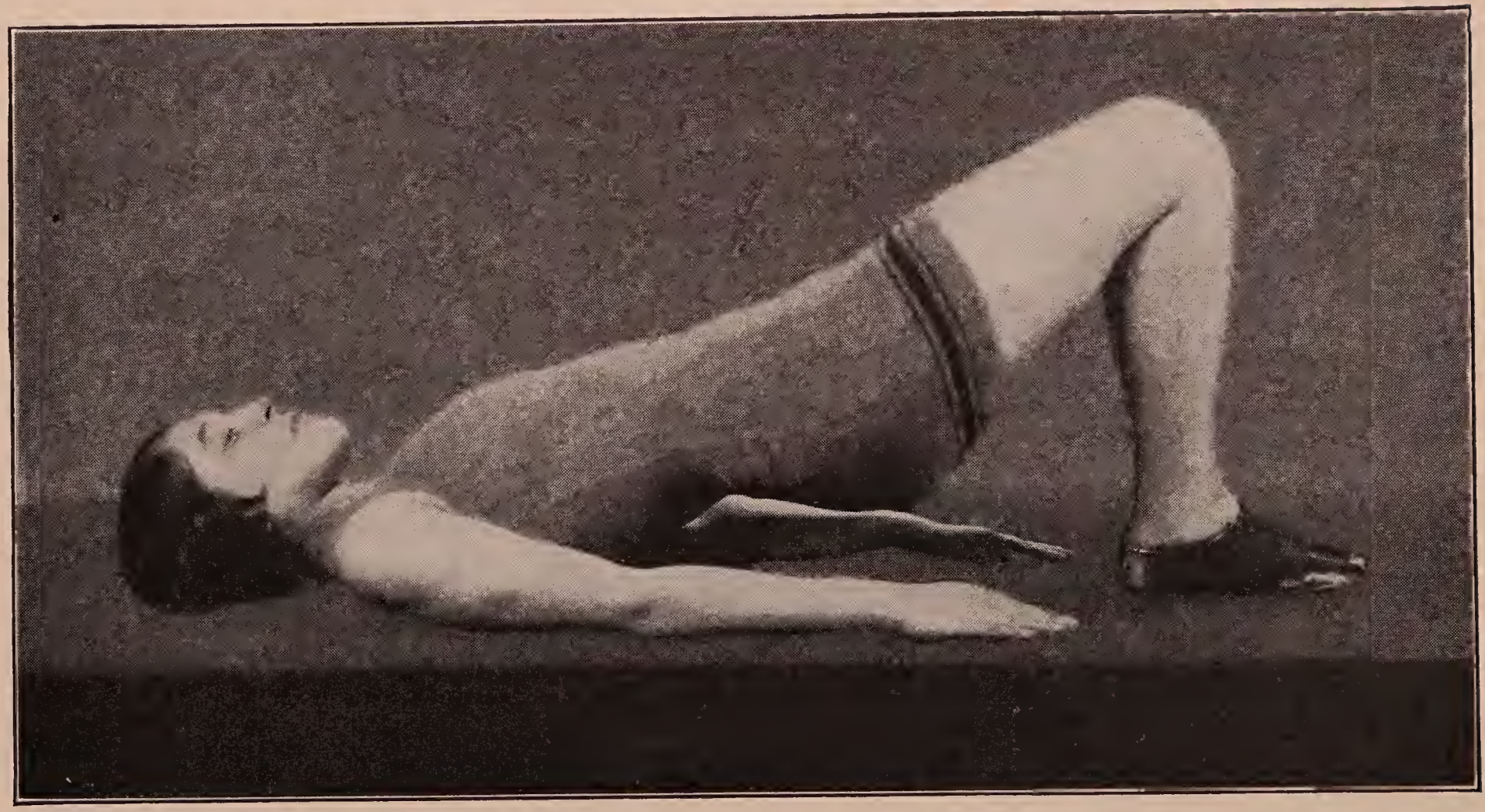
Stand erect, hands on hips. Raise right knee high, lower, and repeat. Then raise left knee similarly. Then alternate right and left. Breathe rhythmically, inhaling as knees ascend, exhaling when lowering knees.

Stand erect facing an attendant, whose hands rest on top of the arms folded across abdomen. Inhale deeply while raising arms as high as possible, attendant resisting the movement. Lower arms and exhale, without resistance. Repeat.

Stand erect facing an attendant, the arms folded in front of face, resting on the hands of an attendant. Inhale deeply while lowering arms to abdomen, attendant resisting the movement. Raise arms and exhale, without resistance. Repeat.

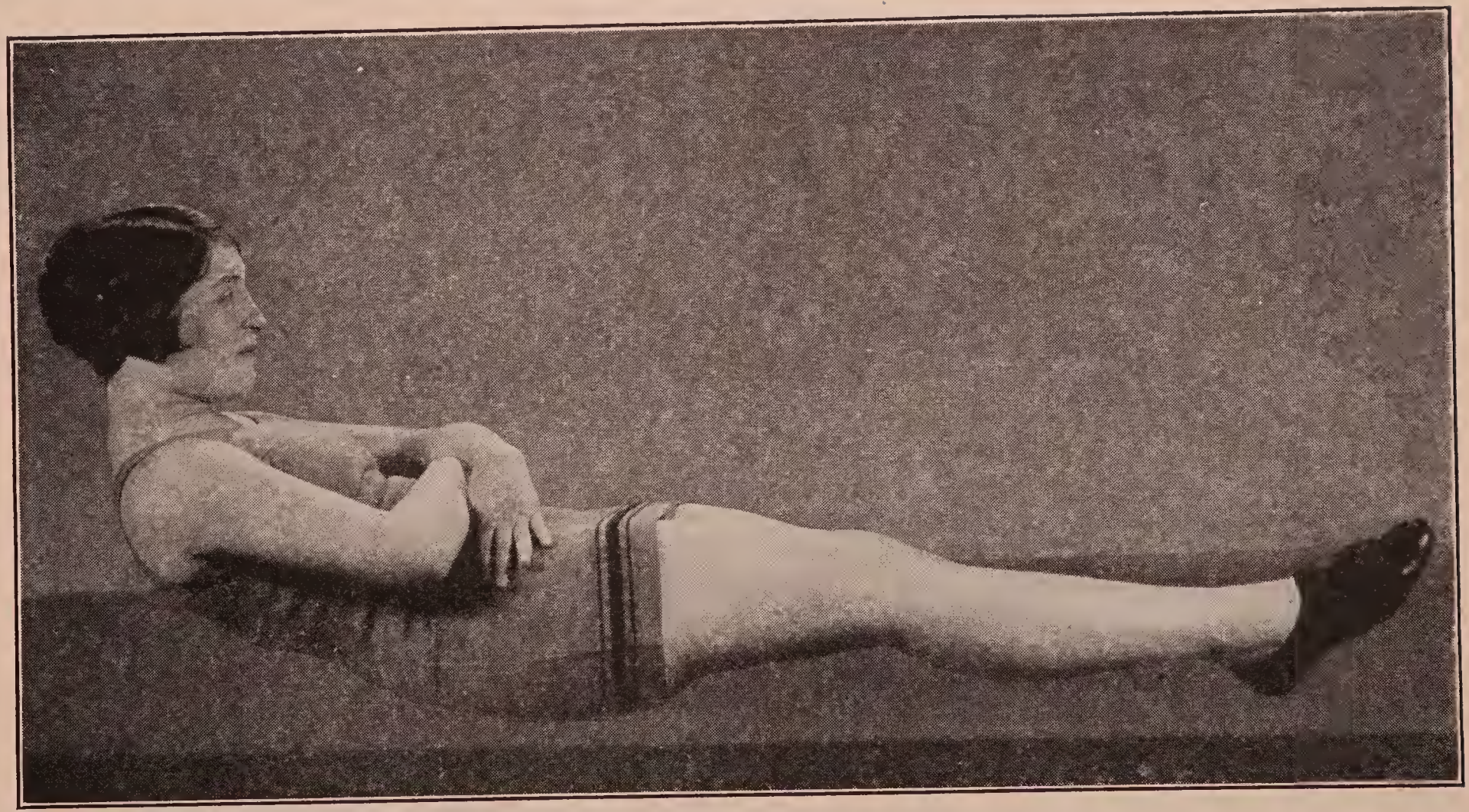


Lying on back, arms flexed with hands to chest. Extend arms to vertical, fingers extended, then lower to starting position. Make this raising and lowering motion four times each while inhaling deeply, then four times while exhaling. Repeat.



Lying on back, arms at sides, knees flexed with heels near hips. Raise hips as high as possible, inhaling deeply. Hold the hips high while completing the deep breath. Then lower and exhale. Repeat several times.

Lying on the back, arms at sides, legs extended. Raise the right leg, knee straight, as high as possible. Lower, and repeat. Then raise left leg similarly. Then alternate right and left. When strong enough raise both legs together.



Lying on the back, legs extended, arms folded across upper abdomen. Raise head and shoulders, as shown. Lower, and repeat. When stronger rise to sitting position. If necessary, place feet under some support.

Lying face down, arms folded beneath the chin, or extending alongside the body. Raise the left leg, knee straight, as high as possible; lower, and repeat. Then raise right leg. Then alternate left and right. When stronger raise both legs.

Lying face down, palms on floor beneath shoulders. Press upward with arms, raising trunk until arms are straight, inhaling deeply. Bend arms and lower trunk, exhaling. Relax a moment and repeat a few times. Later raise hips also, resting on hands and knees.

ing fairly long walks where one would be inclined to get away from the cleared spaces. Within reason, however, the patient should not allow the weather to deter him from going out for at least half an hour every day.

When using the general exercises they always should be started with an amount that is easy to perform and increased gradually in accordance with the patient's strength and progress. The maximum time spent in doing these exercises should not exceed twenty minutes. Rest from general exercise always should be observed two days a week (preferably not together) for the first month and one day a week thereafter. No matter what form of exercise is used it should always be balanced by plenty of rest and sleep, as advised in the section on rest. The statement above in regard to symptoms of over-exertion applies to general exercises as well as to walking.

When all symptoms of the disease have subsided and the exercises already described can be taken without difficulty, more strenuous movements may be adopted gradually so as to increase the strength and endurance up to normal. Many tuberculous patients whose cases have become "arrested" on the usual rest cure treatment continue to avoid all exertion for years, with the idea that they are thereby preventing a recurrence. This may be advisable, at that, when they are simply "arrested" from the conventional treatment. But when they have been really *cured* by having the causes removed by nat-

ural methods of treatment they should gradually increase their activity until they reach the athletic stage. There will be no danger of recurrence so long as they live rightly.

RIGHT THINKING

Practitioners of all schools agree that the mental attitude of the tuberculous patient is very important. It has been said that these patients are inclined to be over-optimistic and, in consequence, to neglect treatment.. I am inclined to believe that this would be preferable to pessimism, with the most careful treatment. In fact, it is impossible to use the right treatment unless the mental side of the patient is considered. The body has often been compared to a machine—and with reason; but we must not allow ourselves to fall into the error of assuming that that is all it is. There is the engineer to be considered. We must treat the patient rather than the disease. That is why the general treatment always must be adapted to individual needs, and it explains why some people get well and others die. Those who die usually do so because they have been thinking wrongly. They may have been unwilling to take care of themselves; or they may have allowed themselves to lose hope; or they may have prevented their progress by continual ill temper; or in a few cases they may have actually desired to die. All action is preceded by thought; and the thoughts must be right if we are to secure results in the treatment of disease.

The general mental attitude should be hopeful, confident, trusting, cheerful, and patient. The patient must accept the fact that he has to atone for his former wrong habits of living. He should resolve to pay the costs as quickly as possible by strict application to the business of getting well. Above all, he should avoid self-pity, for patients who indulge in self-pity are almost beyond help. The natural state of the body is health. The body always is trying to be healthy; and if it is given a chance it always will be so. Hence, there is no cause for doubt or fear. The patient can look forward with confidence and trust to the time when he will be well once more. This should make him patient and cheerful. Impatience causes tension, which interferes with circulation and wastes nervous energy. Depression inhibits all the functions of the body. The emotions can quickly disturb the most vital processes. Therefore, they should be kept carefully under control. This can be done if the patient will learn to relax and will practise the right kind of thoughts.

Thorough mental and physical relaxation should be practised for a few minutes several times during the day, and always just before going to sleep at night. The breathing should be slow and deep. As you relax realize that you are removing every conscious interference with the healing forces in the body. Give yourself up completely to the guiding subconscious intelligence which knows far more about how to run the body than your conscious self

does. Have confidence in this power and you will feel much better after your period of relaxation and will certainly make more rapid progress.

If especially inclined to think destructive thoughts, there are several exercises that may be used after the period of relaxation. One is the well-known autosuggestion. This consists in repeating a number of constructive thoughts from three to seven times each. These thoughts need not be couched in religious or scientific terms, but may be put in any form that suits the patient. The particular ones used will depend on the needs of the patient. If he is homesick he may say, "Distance is only a relative term and has no actual existence. I am now at home in spirit." Then he may visualize home surroundings—though often this makes it more difficult to combat homesickness. If he is depressed he may say "This, too, shall pass. It is always darkest just before the dawn. I can even now feel new life and energy growing within me." If he is inclined to worry he may say "All power is mine to use. I have only to open myself to its inflow. I feel new courage and confidence." When irritable and impatient he may say, "I am poise, and I have peace. I desire all good for others even as I desire it for myself. I will see, hear, and speak only the good." There is an infinite variety of these good thoughts, and the patient or some sympathetic friend easily can formulate the ones which will especially appeal. It is well to memorize the ones that are to be used regularly. After a little

practise the patient will be able to extemporize—to form new thoughts at will. Then he will find it much easier to avoid the destructive thoughts which are interfering with his progress. It may take a little time and effort, but the habit of right thinking can be developed the same as can the habit of wrong thinking. Great care must be observed not to give counter-suggestion to the helpful ones. Sayings such as "I am not ill," "I shall not let people irritate me," etc., serve only to give to the subconscious mind just the impression you do not want it to carry.

Another excellent practise after the period of relaxation is to send out thoughts of love to every one, including not only those for whom there is a real liking, but also those whom you think you do not like. Our so-called enemies are really our teachers, and through loving them we can transform them into friends. This practise has very far-reaching effects. But the ones which will be most readily understood by most persons are the constructive and harmonizing effects. If one is continually thinking thoughts of love it is easy to see how destructive thoughts and emotions will be banished. Love is the most powerful constructive force in the universe, and concentration upon it is certain to have a constructive effect upon the body. This comes about through the harmonizing effects. Most of our mental disturbances arise from fears and dislikes. These cause tension, irritation, and internal conflict. But if we constantly think thoughts

of love all will be harmony, peace, and relaxation.

Another valuable exercise is to visualize yourself as doing the things you want to do and being what you want to be. Most people's desires are inherently good, and thinking about them will keep the mind so occupied that there will be less tendency toward destructive thoughts. Visualizing good things also intensifies the desire for them, and one will be more inclined to work to bring the dreams true. The very fact that one is thinking about these things tends to attract them. So visualize health, strength, poise, power, control, happiness, and success.

Consciously use the mind in all things. As you breathe think of what the air is doing for you; as you take water think of its value; as you take food visualize the life in it adding to your life; as you exercise think of your growing strength; and just before you go to sleep think of all the repair and rejuvenation that are to take place during the hours of rest. Back up your physical efforts by mental efforts and better results will be secured. Always avoid tension, however. The best results are secured when we think the right thoughts calmly, gently, trustingly, and almost without effort.

DAILY REGIMEN

As the successful treatment of chronic tuberculosis depends upon regular, careful, persistent observance of definite health rules, a daily regimen, without doubt, would be of assistance to those who

are going to apply the treatment suggestions I have just described. Of course, no hard and fast rules can be laid down, as each patient must be considered an individual, and due allowance must be made for his condition, temperament, and environment. However, the following plans will be found to apply in most cases.

While resting in bed:

Wake at 7.00 A.M. (optional; but keep corresponding hours if this awakening time is changed).

Take a few deep breaths, as has been described. (Repeat these every hour.)

Cleanse mouth and teeth.

Glass of water or juice of an orange or a whole orange, depending upon diet being used.

Start milk at 7.30 A.M.

If on orange diet, go according to previous directions.

If on solid food, take breakfast at 8.00 A.M.

Rest until 10.00 A.M.

Sun bath, cool bath, and enema if needed.

Rest, especially from 12.30 to 1.00 if on solid food.

Lunch at 1.00 if taking solid food.

Rest.

Additional sun bath at 3.00 if condition warrants it. Other special treatments instead of sun bath if they are indicated.

Dinner at 6.00 if on solid food.

If on milk, the day's quantity should be finished

by 7.00 P.M. (Milk may be taken during sun baths.)

Cleanse mouth and teeth at 8.30 P.M.

Few deep breaths (these should have been taken regularly during the day).

Sleep at 9.00 P.M.

While up and around:

Rise at 7.00 A.M. (see above).

Take a few deep breaths. (Repeat every hour.)

Cleanse mouth and teeth.

Glass of water and juice of one or two oranges.

Dress.

Start milk at 7.30 A.M. or rest until 8.00.

Breakfast at 8.00 if on solid food.

9.00 to 11.00 A.M., take sun bath and cool bath, resting at same time.

Walk at 11.00.

Rest 12.00 to 1.00, if on solid food.

Lunch at one, if on solid food.

Rest in bed 2.00 to 4.00, or take additional sun bath if permitted.

Additional walk at 4.00 if permitted, or other exercise.

Dinner at 6.00, if on solid food.

If on milk the day's quantity should be finished by 7.00 P.M.

Cleanse mouth and teeth at 8.30 P.M.

Few deep breaths.

In bed at 9.00 P.M.

When rest is mentioned it means complete rest, either in bed or in a recliner. One hour of the

afternoon rest period should be spent in sleep if at all possible. There should be a minimum of talking during rest periods.

Any time which is not specifically occupied may be spent variously, depending upon the patient's condition. Some will need to rest during these periods, also. Others may read or write or receive visitors. Some of this time always should be used for mental concentration and autosuggestion. The more improved cases may stroll around, or visit bed patients (if in a sanitarium) or play croquet or cards or other games requiring little exertion. The theater is occasionally permissible—but for the composure of others, who still may have fears of the contagiousness of the disease, all gatherings should be avoided if there is coughing and expectoration.

When there is fever the thermometer readings should be taken every two to four hours, depending upon the condition. As a rule, the longer periods will be sufficient. The pulse, also, is taken at these times. As soon as possible these tests should be discontinued, as they tend to keep the patient's attention concentrated upon his symptoms.

Some time necessarily will be consumed in attending to the bowel and kidney actions. The bowels should be solicited at regular periods during the day —at least twice, preferably three times. If on solid food, just after meals will be the most favorable times. The same hours may be observed if on the milk diet.

As little time as possible should be spent in dress-

ing and undressing. The clothing should be very simple and easily managed. The women should not spend much time in special beauty treatments, even if given by an assistant. The moderately advanced and advanced cases should always have some one else shampoo the hair until they have greatly improved. In the case of women, bobbed hair is more easily cared for, and is much more satisfactory. The men should shave their beards or be shaved regularly.

All these little things, while seemingly unimportant, should be considered. The living habits as a whole should be as simple and natural as possible, dispensing with practically all social formalities, except those positively indicated by good taste. However, the tuberculous patient will or should have little occasion to pay attention to social niceties and requirements. His business is that of getting well, and that only. The more he is interested in social obligations the more will his progress be retarded.

CHAPTER VIII

Treatment of Laryngeal and Intestinal Tuberculosis

LARYNGEAL and intestinal tuberculosis are usually secondary to pulmonary infection. Occasionally they may seem to appear simultaneously with the lung affection, and once in a while before. However, whether it appears before, with, or after the pulmonary infection, the same general treatment will apply, because the same causes operated to produce the trouble, and these must be removed. The same general symptoms of loss of weight, weakness, fever, night sweats, etc., are present. But there are special symptoms, referable to the parts affected, as has already been described in the chapter on symptoms. These special symptoms require various modifications in the general treatment and of other special measures, and it is to these I will give attention in this chapter.

When these parts of the body are affected in addition to the lungs the condition is always more serious, and special care will be needed. The emphasis should be placed upon rest, fresh air, and sunlight or ultra-violet radiations. Remember that the forces of Nature are most powerful. Never

lose confidence in them. Jumping from one "cure" to another in the vain hope of finding something that will give quick relief generally will result not only in disappointment but in the case becoming worse. Be quiet, relax, avoid tension, trust Nature and give her a chance.

LARYNGEAL TUBERCULOSIS

Rest in these cases involves not only the body but, also, the voice. This voice rest is of the greatest importance. Every sound that is uttered causes movement and vibration of the larynx and vocal cords, and when they are inflamed and ulcerated this not only increases pain but hinders healing. In the lighter cases it may be sufficient to limit articulation to whispers; but in the more marked cases absolute silence should be observed. Even in the lighter cases it is well to refrain from using the voice for several weeks. Whenever it is desired to convey some message to another it should be written on paper or a slate. If whispering is allowed it should be limited absolutely to necessary conversation, and the effort to make people hear at a distance should be avoided. The throat can be strained or irritated by a whisper as well as by loud speaking.

As the patient probably will be confined to bed for some time when the throat is affected, proper arrangements should be made for calling attendants. A small table bell usually is the most convenient.

It is usually well to continue whispering until all throat symptoms have subsided, and in severe cases

for several weeks thereafter. Then talking may be resumed gradually. First, the patient may be permitted to speak greetings. A "Good morning!" aloud after a considerable period of silence will have a wonderful effect on all concerned. After a few days of gradual addition of words the patient may be allowed to carry on a conversation for five minutes. It is surprising how much can be said in five minutes; but the patient should not monopolize all this time, but should give the other person a little chance. In three days more the speaking time may be extended to ten minutes. After a week of this the patient may be permitted to make all necessary remarks aloud, but without any special period of conversation. After another week the five-minute period of conversation may be resumed, and then a gradual return to normal talking may be allowed, graduating it in accordance with the progress of the patient. If any soreness of the throat develops silence should be observed for a day or more. When the proper treatment has been used to remove the causes of the trouble, however, there should be no relapses.

There are two other factors besides talking that need to be considered in giving rest to the throat. One is coughing, the other is choking. There is certain to be some coughing, and because of the throat inflammation there is quite likely to be more than usual. Rest, fresh air, and proper diet will do much to reduce this, but, also, the patient should make an effort to suppress all unnecessary coughing. If

there is great irritation and voluntary suppression is difficult or impossible, some of the special treatments to be mentioned a little farther on may be used, such as cold packs, sucking ice, local anesthetics, etc.

Owing to the great swelling which often is present in these cases and to the contraction of the parts from pain, there is considerable danger of choking while eating. The least little thing that gets into the larynx will cause great distress and most violent coughing, which is a serious strain on the diseased parts. When the epiglottis is swollen it may not close as it should, and this increases the difficulty. Precautions to be observed are thorough mastication and rapid swallowing. After having prepared the food for swallowing it should be bolted quickly. In taking liquids, however, it is usually best to swallow them a mouthful at a time rather than to try to drink down a cup or glassful rapidly. Individual cases vary somewhat, and the particular manner of eating which seems to be the easiest should be employed. One thing which always helps is to lean forward when swallowing. This allows the larnyx to drop forward so that it is less in the way and the food has a freer passage into the esophagus. Severe cases or a case where this symptom disturbs severely may have to lie flat on the stomach when eating or drinking milk.

The soreness and ulceration of the parts may make them very sensitive to acids. In such cases it may be well to use vegetable broth instead of acid

fruits. This may be made of celery, cabbage, onions, and carrots. It may be difficult to handle tomato, but if possible to take it, this may be added to the broth. It is a very valuable food. A little garlic, also, may be employed in the broth.

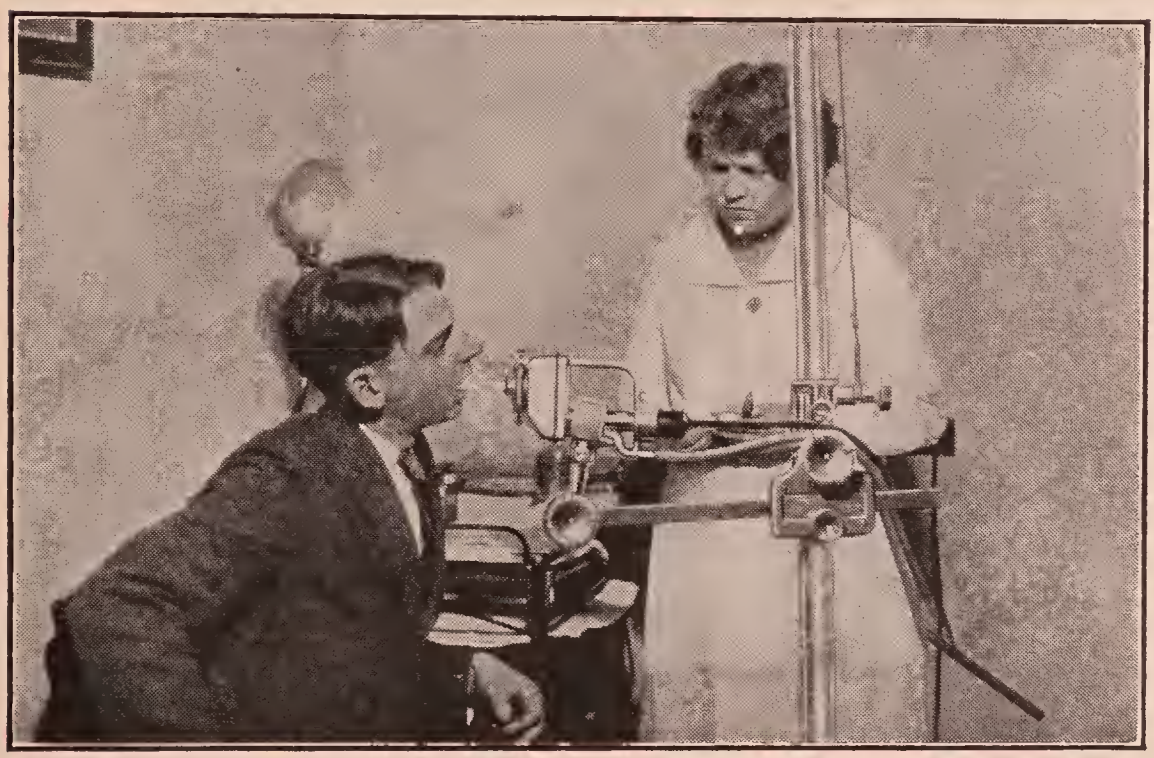
If unable to take the more acid fruits when on the milk diet, it may be possible to use peaches, pears, ripe apricots, and raspberries. Rarely is vegetable broth so satisfactory as acid fruit with the milk. Sometimes fruit juice may be taken in gelatine. The milk should be used if at all possible, as it is the most effective diet. If easier to swallow solids than liquids, some of the milk may be taken in the form of junket—milk coagulated with rennet. (Junket tablets may be procured in most drug stores.) If there is a great difference in the comfort with which solid foods and liquids may be taken, and in favor of the former, a solid food diet may be employed for a time. In most cases the broth diet and other measures will reduce the pain sufficiently to permit of the use of the milk. When there is severe pain it may be well to fast absolutely for a few days rather than to take either fruit juice or vegetable broth.

Fresh air is, if possible, more important than ever when the larnyx is affected. The swelling of this organ makes it difficult to breathe, and what air is secured should be as fresh as possible. Moreover, fresh, clean air will make it easier to breathe. Difficulty in breathing is one of the most distressing symptoms encountered in severe cases of laryngeal

tuberculosis. Some patients may find it impossible to lie down. At night the greatest degree of inclination that comfort will permit should be employed, because it will be easier to sleep—and sleep is life to such a patient. A few hours' rest from the pain and torment means a great deal. During the day the patient can sit up if necessary. In cold weather care must be observed to keep the patient well wrapped to avoid chilling, and the air may be warmed somewhat; but there must be no curtailment in supply. The body is in a position to develop colds at such a time; but the symptoms of a cold may make matters so much worse as to be very serious. Hence, they should be avoided as far as possible through keeping an even body temperature, in addition to the constitutional treatment. These cases may find cool air easier to breathe than warm air, but very cold temperature is seldom well tolerated. A temperature of approximately 60 degrees will be favorable in most cases.

One of the most important factors in laryngeal cases is sunlight. I mean not only the usual general sun baths, but *sunlight in the throat.* In severe cases the heating effect of the general sun bath may increase the throat symptoms, in spite of the use of cold neck packs or drinking cold water or the general cold bath. In such cases it may be necessary to avoid them. General ultra-violet radiations will make a good substitute. In the throat itself, however, the sunlight is most excellent and can always be tolerated. In localities where there is little sunlight,

localized ultra-violet radiations may be used in part, but the natural sunlight should be secured whenever possible. If there is much ulceration the occasional use of ultra-violet locally may be of additional assistance even though the sunlight can be secured regularly; but it will not be absolutely necessary. The disadvantage of such local radiations is that



Local radiation to the throat with a mercury-quartz ultra-violet ray water-cooled lamp, especially designed for local treatment of the orifices of the body.

they require a special lamp, which is not always possessed even by throat specialists. The treatments must always be given by a doctor who understands the use of the lamp and its application in such cases.

The natural sunlight, on the other hand, can be applied by the patient, and with a few simple precautions cannot do any harm. For the application

of the rays special reflecting mirrors will be required. These may be obtained in a combination of aluminum and magnesium, which is more efficient than ordinary glass for the reason that it reflects more of the ultra-violet rays and absorbs (keeps from the tissues) some of the heat rays. The apparatus consists of two large mirrors on a standard which is to be fastened to the back of a chair. One mirror is of glass, for observation, and the other is a concave composition mirror, for focusing and concentrating the sun's rays. There also is a small composition mirror with a long handle for insertion into the throat. The patient sits with his back to the sun, holds his tongue out with one hand by grasping the end of it with a piece of gauze between his fingers, and places the small mirror in the throat with the other hand. He then maneuvers into a position which will permit the sun's rays to fall on the focusing mirror and be reflected to the small mirror and then down into the larnyx. A little practise will soon determine the position to use, and the necessary adjustment of the mirrors. Holding the tongue out is somewhat difficult, but here again practise will bring results. The use of sunlight is so important that some discomfort should be tolerated, if necessary.

The first exposure is for one minute, thirty seconds at a time, with a short rest between the two. Exposures are to be increased one minute per day to three minutes. After three days this should be increased in the same way up to ten minutes. Usually

this is the maximum, but a few cases may use two such exposures per day, taking one in the morning and the other in the afternoon. A short rest in-

Natural sunlight radiations of the larnyx by means of special reflecting and focusing mirrors. The instrument being held in the mouth is a small throat mirror.

tervenes between each two exposures of thirty seconds each. After some practise it will be possible to expose the parts one minute at a time before a rest will be required. The rate of increase always

depends upon the patient's reactions. Some may have to increase more slowly than I have recommended. If there is a slight burning, a rest of a day or two should be observed. A half glass of quite cool water may be taken slowly after the treatment.

The application of a cold neck pack after treatment is helpful. This should be used quite frequently in any case. It may be applied every night for a week, then every other night for a week; then the same over again, continuing indefinitely. In severe cases it may be applied two or three times a day for periods of two hours each. The pack should be applied as follows: Secure a muslin or linen cloth long enough to go around the neck and wide enough to fold into several thicknesses, about three inches wide. This is wrung out of cold water and applied quickly and snugly to the neck, but not tight enough to interfere with circulation. It is immediately covered with a dry woolen cloth which has been previously prepared, and the whole secured in place with safety pins. The woolen cloth should be somewhat wider than the wet pack so as to cover completely and exclude all air from it. A piece of old blanket is good to use, or two thicknesses of any flannel cloth. The pack should become warm from the natural warmth of the skin, within a few minutes after application. It will do this if the wet pack is not too thick, if it is wrung fairly dry, and if both cloths are fitted snugly.

The measures already mentioned will be sufficient

in the great majority of cases. However, in the more severe cases and those which have been neglected or wrongly treated it may be necessary to employ some special measures for the relief of symptoms, while at the same time adhering closely to the constitutional treatment for removal of fundamental causes. These special measures include sprays and drops for the throat, inhalations, local anesthetics, and cauterization.

Spraying the throat is of value for cleanliness and antisepsis. There usually is much mucus in the throat when it is inflamed, and the necessity for frequent clearing of the throat is a strain on the parts. Spraying will cleanse these parts so, that for a time at least, they will have rest. The relief afforded the patient also saves nervous energy. There is danger, however, of too much spraying, which may lead to further irritation. In most cases twice per day will be sufficient. An atomizer with an adjustable end which can be bent downward should be used, in order that at least some of the spray may reach the larynx. An alkaline spray will be best. There are a number of these on the market. Plain salt water may be used also. Usually a spray with an oil base will be preferred, however, as it is more soothing. The fluid should be non-irritating, in order that it cause no pain.

In order to affect the larnyx directly, a similar preparation may be applied by dropping it into the larnyx with a special laryngeal dropper. Such a dropper has a long tube with a curved end, which

should be inserted well down into the throat. Just a few drops, of any chosen preparation, will be sufficient. When the purpose is cleanliness the same fluid used for the spray may be employed. If there is ulceration of the larnyx, preparations containing menthol, camphor, or eucalyptus will be not only cleansing but will give some relief from pain, though there will be some slight stinging sensations for a few moments. These drops may be employed one, two or three times a day. If spraying is also being used, the drops may be placed in the larnyx just after the throat has been cleansed by the spraying. If there is much swelling a solution of adrenalin will produce a little shrinking. But this should be employed only in extreme cases and no longer than is absolutely necessary, and it should be used only as prescribed by a physician.

Often the swelling of the larnyx will interfere with breathing, in which case inhalation of one of various vapors may be used for temporary relief. Those most commonly employed include the various combinations of tincture of benzoin, pine oil, menthol, etc. The use of these can be easily overdone, as the vapor also reaches the lungs, where too much of it will produce irritation. Such an inhalation need be used only before retiring, in most cases, to assist the patient in getting to sleep through the temporary relief afforded. It should not be continued any longer than is necessary.

There is a form of inhalation, however, which will benefit not only the larnyx but the lungs, also.

This is much akin to fresh air, the king of all inhalations. It is called *Terpezone,* being a combination of the vapor of refined turpentine (from pine tree and ozone). It is non-irritating, and gives much relief through its cleansing and antiseptic effects. Unfortunately, this treatment is only just being developed and is not yet used widely enough to be readily procurable by all patients. Though practically always of assistance, it is by no means such a necessity as are fresh air, sunlight, proper food, etc.

One of the most distressing symptoms associated with laryngeal tuberculosis is pain. Often this is very acute and very constant, and disturbs the patient greatly. In so far as possible it should be ignored, and dependence for relief placed upon fresh air, silence (throat rest), sunlight, and cold neck packs. In neglected cases, however, it may be so disturbing as to call for more drastic measures, such as the use of local anesthetics. These give a very transitory relief, and some of them are toxic. They should be employed only as a last resort and only for as long as is absolutely necessary. Probably the least toxic ones are orthoform and anesthesin. These are in powder form and are sprayed into the larnyx with a powder blower, inhaling at the same time. Sometimes it will be more effective to combine the powder with olive oil and drop it into the larnyx with a laryngeal dropper. These preparations should not be used repeatedly as soon as the effect of each application wears off. They should be employed only for a specific purpose, such

as to lessen pain while eating or to give the patient a chance to get to sleep at night or occasionally in the afternoon. When the proper general treatment is being used, and especially when sunlight is being reflected into the larnyx, there will soon be sufficient relief to make the anesthetics unnecessary. When these are used they should be prescribed by a physician in order that proper quantities may be employed for perfect safety.

In the most extreme cases, where there is much swelling and ulceration, there is one final thing that may be tried. This is the galvano-cautery. It is used with local anesthesia by cocain. The white-hot needle is plunged directly into the swollen cartilages and is used to sear the ulcers. The burning causes the formation of scar tissue, which in time shrinks, thus reducing the laryngeal swelling. The cauterization sterilizes the ulcers. This treatment must be used with the greatest care, and only a thoroughly qualified operator should be employed. There is danger of causing too much scar tissue with closing of the throat. In treating ulceration on the vocal cords by this method there is danger of doing them permanent injury. When properly done, however, the treatment may be of value in severe and critical cases. Pain and general discomfort are always increased for about a day after treatment, but after that there is relief. The frequency of treatment will depend upon the exact condition. It never should be done any more frequently than is absolutely necessary. Remaining discomfort after

the effects of the anesthetic wears off may be somewhat reduced by sucking ice after the treatment and by applying cold neck compresses for about an hour.

It is very important that prompt treatment be adopted at the first signs of laryngeal affection, for the safety of the local tissues and the voice, for the patient's mental composure, and in order that these drastic and somewhat dangerous treatments may be avoided. If one has a case of pulmonary tuberculosis it is well to have the larnyx examined occasionally, as it is possible for trouble to start in this region without much pain or soreness. By such examinations one may be able to nip in the bud any developing laryngeal involvement. The patient should not be continually thinking about the larnyx and wondering if it is all right, but should include the examinations simply as a part of his routine. Under proper general treatment it is very rare that other organs of the body will become involved. If the larnyx does become affected, remember the importance of abstinence from food and the use of sunlight, and do not neglect the proper use of the mind.

INTESTINAL TUBERCULOSIS

This is another quite serious tuberculous condition. It seldom appears except in cases which have been improperly treated, especially in regard to diet. When it occurs before lung affection it will be found in those cases who have been on a very improper diet or where the intestines have been weak-

ened by an inflammation, such as that of typhoid fever. Of course, the typhoid fever itself would never have occurred if the diet had not been very unsatisfactory. In any case, when this form of tuberculosis develops, constant adaptation of treatment will be required for some time.

As the fever generally is moderately high, rest is especially important. The same general plan is followed as already has been described, except that complete rest is continued somewhat longer.

As for the diet, vegetable broth usually is preferable to the fruit juices, though if the latter have been producing no irritation in the regular diet they may be continued. Often it is well to take an absolute fast for about three days, then broth for two or more days. Another helpful drink is flaxseed tea, flavored with a little honey and lemon juice. The flavoring is kept at a minimum. A satisfactory schedule for the broth is a cup every two or three hours; but the flaxseed tea may be taken in half-cup doses whenever desired. If the diarrhea is severe and there is hemorrhage, the flaxseed tea should be used even when the broth is omitted.

After the fast and broth or fruit diet the Salisbury meat diet may be adopted with benefit for one to two weeks, the length of time depending upon the weight and strength of the patient and the progress made. This diet consists of nothing but broiled scraped beef and hot water. Three meals a day are to be taken, each meal consisting, at the start, of four ounces and increasing two ounces per day

up to twelve ounces at each meal. A glass of hot water should be taken one hour before meals, and one a half hour before retiring. This quantity at each time is gradually increased to two glasses (one pint). The meat is prepared as follows: Lean round steak is secured, and whatever fat or connective tissue is present is carefully removed. The flesh is then ground in a food chopper, formed into cakes, and broiled. A little salt may be used to flavor the meat, and a little lemon juice may be added after cooking if desired. After a few days a little grated garlic may be incorporated with the meat. Nothing but the meat and hot water is to be taken for at least a week, and if the weight and strength are satisfactory it may be continued for another week. A few pounds loss in weight may be expected. If the bowels do not evacuate enemas should be taken daily.

The meat diet should be followed by the usual milk diet, preceding the milk diet with one day on acid fruits which should be well tolerated by that time. The usual plan of taking the milk is to be followed. If diarrhea occurs the quantity of milk must be somewhat limited. As soon as some weight has been gained the meat diet should be taken again for a week, preceding it by one day on nothing but hot water. In some cases diarrhea may be sufficiently corrected by employing gelatine in the milk. This is employed in the following manner: Take one tablespoonful of plain gelatine and soak for ten minutes in several ounces of cold milk. Then add

an equal amount of hot milk and stir until dissolved. Add this to a quart of milk. Each quart used is to be treated in the same way. If this is not effective in controlling the diarrhea the milk may be made into junket. Sometimes dried milk, diluted with half the usual quantity of water, will be helpful. In this case a smaller total quantity should be taken. As a rule it is not well to employ dates, as suggested for diarrhea developing in ordinary cases.

These adaptations are not made with the idea of entirely checking the diarrhea. If it occurs it is because it is needed, and four or even five evacuations a day would not call for any change in the milk. In no case should drugs be taken to suppress the diarrhea. The diet suggested is important, and should be used if at all possible. If there is much gas when on the milk diet the milk may be taken in smaller quantities at more frequent intervals, or it may be diluted one-third with barley water, gradually returning to straight milk as the condition improves. If constipation should occur the usual enemas must be taken. It is hardly likely that any insurmountable difficulties with the milk will be experienced when it is preceded by the meat diet and the proper general treatment is taken.

A mixed solid food diet should not be employed except as a very last resort. The intestines are inflamed, filled with mucus, and often ulcerated. Solid food is very prone to fermentation and putrefaction, with the production of large quantities of gas and consequent severe pain; also, it is irritating to the

inflamed intestinal surfaces. If the milk cannot be handled and the weight and strength will not permit further use of the exclusive meat diet, a diet of the broiled lean beef, together with fresh raw green vegetables, especially onions and garlic, but also lettuce, spinach, tomato, and in some cases carrot, may be tried. Everything must be very thoroughly masticated. The quantity of meat on this plan should not exceed eight ounces per meal. The hot water is to be taken as has been directed. Gradually other vegetables may be added as the condition improves, also toasted whole wheat bread (preferably oven-toasted) and boiled whole grain rice.

The fast or broth or fruit diet should be repeated as often as the weight and strength will permit until the desired results have been secured. It is very necessary that the intestines be restored to a normal condition in order that food may be properly digested and assimilated and the necessary building materials furnished the body. Unless the intestines are in a condition to do this it will be useless to give any appreciable amount of food and the loss of weight occasioned by the frequent periods of abstinence should not be considered a detriment. Weight will be gained more quickly thereafter, and the general improvement in the whole condition will show the value of this treatment. It is the continual feeding in spite of the inflammation, and the use of drugs to check the diarrhea, which makes intestinal cases so serious under orthodox treatment. Patients who already are much underweight and lack-

ing in strength can still take an occasional short fast; and in these cases the frequent or occasional use of the exclusive meat diet will be found very helpful. This has some of the advantages of the fast while at the same time it furnishes a little nourishment. Diet is sometimes quite a problem in intestinal cases, but with the assistance of other appropriate measures it should soon be solved.

One of the most important of these other measures is ultra-violet radiations. On account of the fever, which is usually present with greater persistence in these cases, the radiations are preferred to the natural sunlight, though the latter may be employed if the former are unobtainable. In giving the radiations the lamp is centered over the abdomen, but the entire body is exposed. The back also should be rayed, centering the lamp over the lumbar region. A start is made with two-minute exposures, increasing one minute a day up to twenty or thirty minutes for each side of the body. The eyes should be protected with colored glasses. After three or four weeks' treatment, five to seven days' rest is observed and the treatments started again. The height of the lamp above the body should be 36 inches at the start, gradually lowering it to 24 inches after the full length treatment has been reached. The exact height of the lamp and the rate at which the exposures are increased will depend upon the patient's reactions, and the age and efficiency of the lamp.

If necessary to employ natural sunlight, only the

abdomen is exposed until the temperature is normal. Treatment must be started carefully and exposures lengthened gradually, the same as with the ultra-violet rays. A cool sponge bath should be applied to the parts after the treatment. The maximum exposures should be thirty minutes until fever has entirely subsided, after which as much as three hours may be taken, the entire body being gradually included. When taking over thirty-minute exposures the parts may be sponged with cool water every ten or fifteen minutes, depending upon the heat of the sun and the desires of the patient. All treatments should be concluded with a brief application of the cool water. It is seldom necessary to observe stated rest periods from sun baths, as there will be days when they cannot be obtained. If symptoms seem to be increased at any time, however, the baths may be discontinued for two or three days. This is very unlikely to occur if the exposures are properly graduated. The head may be kept shaded if desired. This is advisable only for very weak patients or when the sunshine is very hot and direct. Usually the best times of the day for sun baths are mid-forenoon and mid-afternoon.

Some cases may find it difficult to obtain either the sun baths or ultra-violet radiations. In these cases the cold abdominal pack may be used to great advantage. This consists of a muslin or linen cloth of several thicknesses, wide enough to cover the abdomen from the breast bone to the pubis, and long enough to go completely around the body and

overlap a few inches. This is wrung from cold water, quickly and snugly applied, and completely covered with a somewhat wider piece of woolen cloth of sufficient weight to prevent much evaporation (usually about three thicknesses). The whole may be covered with a waterproof cloth if such is available. This is preferable. The pack should remain on for two hours or so. It usually is given in the afternoon, but in severe cases it may be applied before retiring, also, and allowed to remain on all night. Upon its removal the abdomen should be bathed quickly with cold water, carefully dried, and covered well for warmth. After the fever has entirely subsided the abdominal pack need be applied only once every other day for two weeks, then twice a week for as long as it seems to be producing favorable effects.

Enemas usually will be required while fasting or while taking broth or fruit, and perhaps especially while on the meat diet. They should be used while fasting, even if there is diarrhea. The enema water should be boiled and then cooled sufficiently for injection, but it should be taken as hot as can be comfortably borne. Plain water usually is sufficient; but if the lower bowel also is affected, the juice of a lemon to each pint of water will be helpful. An infusion of garlic may be used, also. The high enema should not be employed if the large intestine is affected, and only if specially needed in other cases. While on the meat diet a pint of water will usually be enough for the enema. This quantity

will be sufficient in most cases when on the milk diet. In either case, however, it may be necessary to repeat the enema immediately after ejection of the first enema. The water should always be injected very gradually.

There are no special exercises for this condition. When the general health warrants it, walking may be started and increased very gradually.

CHAPTER IX

Treatment of Bone Tuberculosis

BONE tuberculosis usually occurs independently of a lung infection, and, therefore, admits of somewhat different treatment, especially in the lighter cases. However, the same fundamentals apply; and if the condition has progressed so far that there develops the characteristic general symptoms of loss of weight and strength, fever, etc., the same general treatment as has been given for pulmonary cases should be used, with such modifications as will be described here. In advanced cases of bone tuberculosis the lungs may become affected, and frequently other organs as well, in which cases the general treatment is still more necessary. The severity of the case, however, does not vary the nature of the treatment so much as the duration of treatment. The essential factors of rest, proper food, air, sunlight, sleep, etc., are just as necessary in incipient cases as in the more advanced cases, but the latter will require a longer period of treatment.

REST

As usual we start with rest. The degree and duration depend, first, upon the general condition. If general symptoms are present or if other organs are affected, the same plan of rest will need to be followed as for chronic pulmonary cases. If the condition is just starting and there are no general

symptoms, rest in bed may not be necessary, but plenty of sleep should be secured. If the shaft of the bone is affected anywhere but in a leg, walking will be permitted, and complete rest need be observed only for the affected parts. If the legs are affected, and especially if the hip joint is involved, bed rest for a few weeks will be necessary even in the lighter cases; and in severe cases of this kind protracted rest may be required. In the lighter spinal cases walking may be permitted; but this will depend upon whether or not it causes pain. If there is a disinclination to walk, even these light cases had better rest for a few weeks. In all but the lightest spinal cases rest is very necessary. And if the cervical spine is affected rest is imperative. In these cases the strain of activity will bring about greater deformity, with correspondingly greater danger of causing spinal cord pressure and paralysis. When the cervical spine is affected to any considerable extent such activity may cause death.

There are various methods of enforcing rest. If an arm is affected the part may be carried in a sling. If the legs or hip joints are affected rest in bed will be required, though usually only one hip joint is diseased. If sunlight can be secured it usually is not necessary to use any brace on the leg. If the environment is not ideal, traction (stretching) often will be helpful—a special traction splint being best to use for this. In these cases when the diseased part is protected from injury by immobilization, the up-

per body may be given a certain amount of exercise, and deep breathing may be practised. When the spine is affected to any marked extent rest in bed will be indicated; and in severe cases or if the environment is not ideal, a plaster jacket or a brace of some kind may be required. When the cervical spine is affected it generally is best to recline on the back, with sandbags on each side of the neck to hold the head stationary and a small bag beneath the neck to support the spine.

All splints, braces, etc., should be avoided as far as possible. When the proper general treatment is used, especially sun baths, it usually is possible to get along without such artificial assistances. Any untoward movements which the patient might make, even while in bed, will be checked by pain—Nature's danger signal. Yet there will be cases where immobilization will be necessary, especially to prevent injury by movements during sleep, and to permit relaxation for sleep without fear of injury.

The length of time necessary to observe rest of the affected parts, of course will vary with the severity of the disease and the reactive power of the patient. As a rule it is well to observe rest until healing is complete, which will be indicated by the disappearance of symptoms. If general symptoms are present these probably will disappear before the local symptoms; but rest of the affected parts must be continued until the latter, also, have been overcome.

DIET

Diet is the same as for chronic pulmonary cases, especially if there are general symptoms. With due allowance for age, the fruit diet usually can be continued somewhat longer than in lung cases—perhaps about one-third longer. The extra cleansing which this diet permits and assists in securing will do much to reduce the local inflammation and prevent or lessen abscess formation. Regular repetitions of the fruit diet, which may be taken every month, may be extended a day or so each time. The milk diet is especially important in bone cases, because of the large amount of calcium which milk contains. Calcium always favors all healing, especially healing of bones. It is very necessary for bones, as they are largely composed of it. It is very seldom that any circumstances will arise to make the milk diet impossible, particularly since most of the patients will be children. However, if a solid food diet should be required it should include large amounts of the foods containing the most calcium—string beans, kidney beans, carrots, cauliflower, oranges, peaches, figs, berries, onions, and greens of all kinds. Of course, milk, buttermilk, and cheese are included even in the solid food diet. Eggs, beechnuts, Brazil nuts, and figs also are valuable; but, being concentrated foods, they must be used in moderation. Particular care always should be taken to provide an abundance of raw foods. These yield much more

of the necessary elements and vitamins per ounce or per meal than cooked foods.

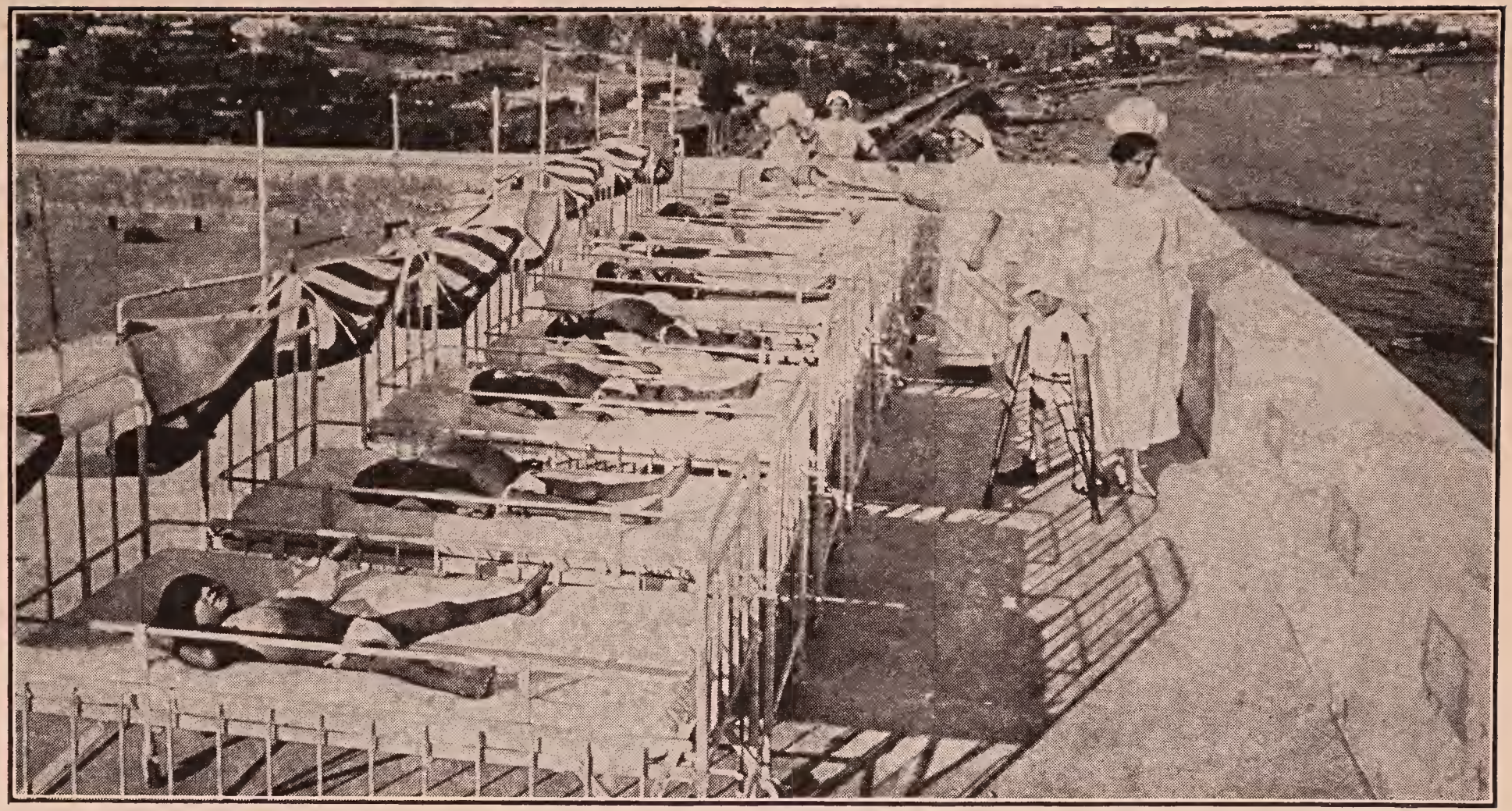
FRESH AIR

It is fortunate that in most bone cases deep breathing may be practised regularly, unless the lungs also are affected. Fresh air is of the greatest value when large quantities of it can be drawn into the lungs. As has been explained, some care is necessary in lung cases; but when only the bones are affected good deep breaths can be taken as desired, and should be taken every hour. The same plan of holding the breath for short periods should be observed as suggested for lung cases. Conscious deep breathing can be practised as much as the patient desires, merely stopping short of dizziness. A little giddiness may be felt when first starting deep breathing; but by increasing the amount of breathing gradually it will cause no trouble.

Do not forget that the skin also requires air. If sun baths are taken as suggested in the next paragraph considerable air, naturally, will reach the skin. Whenever the weather permits, air baths in addition to those obtained while taking the sun bath may be taken to advantage.

SUNLIGHT

The reader should have the conviction by this time that sunlight is one of the most powerful aids in restoring tuberculous patients to health. In bone cases it is especially important; and, fortunately, it



Tuberculous children taking the fresh air and natural sun bath at a hospital on the shores of the Mediterranean sea. This locality is famous for the brilliance of its sunlight and the children are being given the full advantage of it. Note how they are tanned.

can be used freely in these cases, since fever generally is slight or absent. General exposures should be used, following the same plan as has been described for lung cases. If the patient should be so unfortunate as not to be able to expose the entire body, the affected parts at least should be given the benefit of the sun. The natural sunlight is superior to the ultra-violet rays for these cases, but the latter are very good when the sun cannot be obtained. One trouble in using the sun baths is that the rays may be rather frequently obscured by clouds. On cloudy days the ultra-violet lamps will prove a valuable adjunct.

The use of sunlight in tuberculosis, and especially when the bones, skin and glands are affected, received its chief impetus from the work of Dr. Rollier. And through his work the medical doctors were brought to look more favorably upon other natural methods of treatment. Dr. Rollier founded a sanitarium in Leysin, Switzerland, which has become famous all over the world. Sun baths are a very prominent, in fact, the leading factor of treatment at this sanitarium. The sunlight is very bright and effective in the mountains of Switzerland, and even though the air is cold in the winter the sun is so warm that the sun baths are continued the year round. The skin naturally becomes much more active under continued exposure, and will be much more efficient in resisting cold. While Dr. Rollier places his chief reliance upon the sunlight, he is also very sensible regarding diet and other health-restor-

ing measures. He does not believe in overfeeding, but gives just enough to maintain weight and strength. The amount required for these purposes will be found to be less when taking the sun baths than at other times. Less fuel food is used because light, heat, and energy are obtained from the sun. When resting, very little protein food will be required. All foods will be better utilized under the influence of sunlight, as has been proven in the treatment of rickets and in observing the remarkable effects of ultra-violet radiations upon animals fed on a deficient diet. Dr. Rollier does not even use cod-liver oil, a favorite prescription with most doctors. I wish to add, however, that I have no objections to using cod-liver oil. It is an excellent additional means of securing valuable vitamins.

The effects of the sun are so wonderful in promoting health that braces are not used, even in spinal cases. This is a great advantage in joint cases, as there is less tendency to complete ankylosis. It also has been found that the sunlight and proper diet keep the muscles firm even without exercise. Consequently, there is no weakening effect from the enforced rest. Altogether, the sun deserves credit for doing much of the healing work.

Dr. Rollier's method of giving the sun baths is as follows: On the first day he exposes the feet for five minutes at a time two or three times a day. On the next day he exposes them ten minutes, then fifteen, and so on, increasing five minutes a day. On the second day he also exposes the legs for five min-

utes and then increases five minutes a day. Thus on the second day the feet are uncovered for five minutes and then the legs for five minutes, making a total of ten minutes for the feet. On the third day the abdomen is included in the same manner. On this day the feet will be exposed for fifteen minutes, the legs ten minutes, and the abdomen five minutes. The rest of the body is then added in the same manner, so that at the end of two weeks general exposures are being given for thirty to forty-five minutes. This is gradually increased to from three to six hours. A good coat of tan usually is a favorable indication of healing. This is an excellent plan for anyone to follow in taking sun baths.

WATER

Use this element of Nature as has been directed. When on the milk diet little or no water will be required for drinking purposes. Enemas are to be taken as necessary.

There is no necessity for using special compresses or packs so long as the sun baths can be secured. If unable to obtain either these or the ultra-violet radiations, cold packs will be found helpful in reducing inflammation. These are applied in the same manner as the cold neck pack for laryngeal cases and the cold abdominal pack for intestinal cases, except that the cloths are cut to fit the part affected. If a hip is affected it is well to pass the pack completely around the body, using the regular hip packs. In spinal cases the cloths (at least six or eight inches

wide) are laid over the part and secured with a bandage about the body. Alternate hot and cold spinal compresses are helpful in these cases, the hot being applied for three minutes and the cold for one minute, making several changes. It is better to follow these alternate compresses with a cold wet cloth covered with flannel, with or without an impervious material, this "heating compress" to be left on for at least two hours. Hot compresses alone or a hot water bag may be used for fifteen minutes at any time for the relief of pain, though some may get more relief from the application of cold. The latter should not be continued more than eight to ten minutes.

When healing has resulted, exercise should be started. If one has an attendant to assist it is well to start with passive exercise; that is, the operator moves the part in all possible directions the same as though the patient were actively exercising it. This should be followed by massage. When mobility has been improved, active exercise may be started, increasing cautiously and gradually. If ankylosis has occurred, naturally a restoration of normal mobility cannot be expected, and no attempt should be made to break the ankylosis. Simply carry each movement as far as possible. There will be some improvement beyond the first very limited motion. Often there will be a false ankylosis due to long inactivity of the joint and to induration or other condition besides direct union of the diseased surfaces of bones forming the joint. In these cases

full mobility of the joint may be recovered if there is no true, bony ankylosis.

EXERCISE

The exercises which may be taken in cases of bone tuberculosis will depend upon the parts which are involved. Walking, as in most cases of tuberculosis, is the best of all exercises, and is to be employed whenever possible. Unfortunately, the hip, knee, or ankle is very frequently affected, and many spinal cases are not diagnosed until they are fairly well advanced; hence walking can be used only in a limited number of cases. But if the lower extremities cannot be used the upper ones can be, unless the spine is badly involved. Even a small amount of exercise will help to keep the circulation more active and the digestion and elimination better. It also helps to occupy the patient's mind.

If the arms and spine are sound there may be used such movements as flexing and extending the arms, rotating the arms, swinging the arms in circles, shrugging the shoulders, drawing the shoulders forward and pulling them backward, bending the head in all directions, and tensing the muscles along the spine. Even if the patient is confined to bed in a reclining position most of these exercises will still be possible.

If only one arm or one shoulder joint is affected, the part may be held stationary with bandages while taking general exercise, including body bending movements, raising and lowering the legs, flexing

and extending the legs, the full knee bend, etc.; also movements in a reclining position, such as raising and lowering the legs, flexing and extending the legs, sitting up and down, etc., could be used.

In all spinal cases, even the mild ones, it usually is advisable to observe complete rest for a few weeks at least, after which walking is the only exercise that should be used until healing has been brought about. In severe cases complete rest must be observed until healing has resulted.

Whatever the exercise used, it should be taken only once a day, starting with an amount that is easy to perform and increasing gradually. Usually three repetitions of each movement are sufficient at the start, the number gradually increasing to eight or ten. Rest from exercise should be observed two days a week (not together) for four to six weeks, and always one day a week. Any movements which cause pain should be avoided. There should be a period of complete rest for half an hour or so after each exercise period.

The medical plan of enforcing rest for a considerable time after healing has resulted is unnecessary when natural methods have been used, for the reason that by the time healing has occurred the body has been cleansed of the toxins furnishing food for the germs, and sufficient vitality and resistance have been developed to prevent any new germs from gaining a foothold. Under orthodox treatment the local part may apparently heal even while the body is still toxic and the vitality only partly raised.

When genuine healing and strengthening of the entire body has been brought about by proper treatment, the only precautions to be observed are those covered in Chapter XIII on "After-Care." Of course there always is *gradual* increase in amount of exercise.

SURGERY

In cases where there is much abscess formation there occasionally may be a legitimate use for surgery, especially in spinal cases where the pressure of the abscess often causes paralysis, and in all cases where the abscess shows a tendency to burrow to great distances. Incision of the abscess so as to allow free draining is the usual procedure. Further cutting should be avoided if at all possible. All aseptic precautions should be rigidly observed.

It is well to understand, however, that such operations are attended with considerable danger of further infection even when great care is observed, and for this reason if for no other the use of the knife should be avoided whenever possible. Generally it is only the neglected cases which will require such assistance. If properly treated from the start there will be little abscess formation, and this will be absorbed as the condition improves. In more severe cases natural drainage through sinuses will be brought about, and after healing the sinuses will close. Many times even in the severe and neglected cases a few weeks' strict attention to rest, sun baths, and proper diet, including a fruit diet,

will render an operation unnecessary. Strictly natural methods should always be given a fair trial first, since they will be needed, anyhow. Most bone cases are among children, and the young generally respond very readily to rational treatment.

In healed cases where there is ankylosis with considerable deformity, operations are often used to overcome the malposition; but this practise is generally to be condemned. In spinal cases it should never be employed. In hip cases it may occasionally be used if the deformity is extreme and there seems to be a good chance of overcoming it. Mobility of the joint cannot, of course, be restored. No operation should be considered unless the patient is fully recovered and in the best of health. If the deformity is not great one should leave well enough alone.

MENTAL ATTITUDE

A patient, hopeful, confident mental attitude is as important in these cases as in chronic lung cases. Considerable time usually is required for healing; and in the spinal cases, particularly, it may be necessary for the patient to lie a long time in one position, which is both tiresome and discouraging. The fact that most of these patients are children is a fortunate thing, because children naturally have more faith and optimism than adults. If they are handled correctly they will readily understand the necessity for keeping cheerful and avoiding temper and will be an example to their elders. Love is the keynote in handling children as well as others.

CHAPTER X

Treatment of Tuberculosis of the Skin and Glands

THERE is such similarity in the treatment of tuberculosis of the skin and of tuberculosis of the glands that they will be considered together in this chapter.

Skin cases, as a rule, are independent of lung infection and it is rare that there are any general symptoms. The condition seems to be local; but when one understands the true nature of tuberculosis it is easy to see that the real disease is constitutional, only the manifestation being local. However, the localization of manifestation permits the use of exercise, deep breathing, etc., which often may have to be omitted for a time in lung and other cases.

The gland cases considered in this chapter are those where only a few glands are affected, the condition apparently being local, as in skin cases. Usually only the glands of the neck, armpit, or chest are affected. Sometimes one or both testicles or one or both kidneys may become tuberculous. Severe cases of this kind may exhibit general symptoms; but as a rule the symptoms are sufficiently localized to permit of liberal treatment.

Of course, in lung cases and often in other cases the lymph glands may be affected to some extent, either locally or generally. However, in these cases the glandular manifestations may be considered a complication of the major trouble, and treatment for the latter will take care of the glands. A more generalized glandular infection without lung infection, as appears in scrofula, is to be treated the same as a chronic lung case, since it exhibits much the same symptoms—though such added exercise and deep breathing as the condition will permit should be used, also. The same applies to tabes mesenterica, mentioned in the chapter on symptoms of tuberculosis. In tuberculosis of the kidneys rest usually is advisable until there has been definite well established improvement.

Since skin and gland cases are more common among children, it would be well to give attention to the chapter on treatment of children, as well as to the chapter on treatment of chronic lung cases and this chapter.

SKIN TUBERCULOSIS

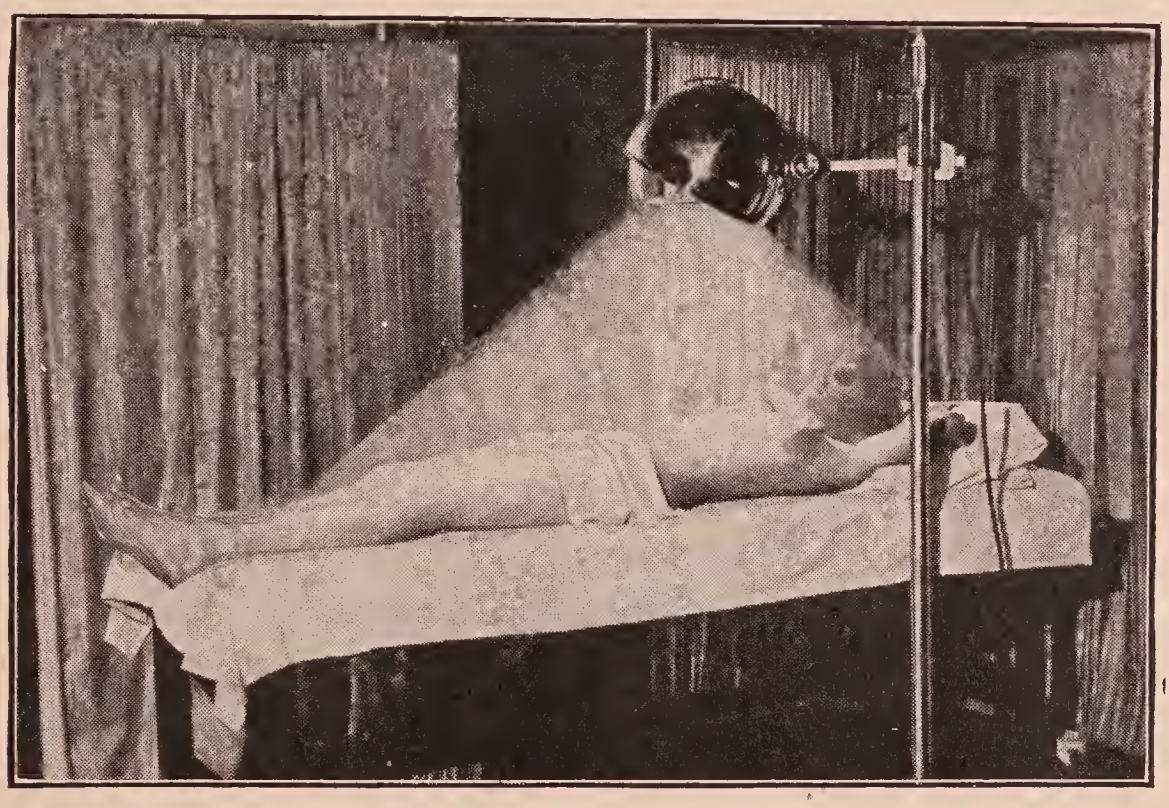
In these cases complete or even partial bed rest is not necessary. Of course, plenty of sleep should be secured; but even a well person should see to that. As recovery from tuberculosis is largely dependent upon an increase in vitality, the patient with a skin case has the advantage of being able to use two very helpful agents—exercise and deep breathing.

If unaccustomed to exercise it must, of course, be started carefully and increased gradually. There are no movements which will have a specific effect in overcoming the trouble, but general exercises should be employed for their constitutional benefit. All the larger groups of muscles should be used at each exercise period. Very satisfactory exercises will be free-hand calisthenics, such as bending the head in all directions, raising and lowering the shoulders, circling the shoulders, swinging the arms in all directions, bending and twisting the body, raising and lowering the legs, the full knee bend, etc. At first there should be an amount that is easy to perform, and this is increased gradually. Once per day, six days a week, usually will be sufficient, as some daily walking should be employed, also. Walking is always excellent. As much as ten miles a day may be taken if there is time for it, though, of course, this distance must be approached gradually.

Deep breathing should be combined with the walking, and also used before and after the general exercise periods and for a few minutes whenever convenient during the day.

As to diet, this should consist, as usual, of the fast or fruit diet followed by the milk and fruit diet. In most cases the acid fruit diet is to be preferred to the absolute fast, and this may be continued as long as ten days if the weight and strength will permit. This duration usually is possible, as the general health is not affected to any great extent except in the more advanced cases. The longer fruit diet

will permit more thorough cleansing, and the metabolism will be more strongly accelerated thereafter. The milk diet should follow the fruit diet, the same as in chronic lung cases, observing two or three days on the fruit every month. The milk diet is much the best of all diets, and every effort should be made



General radiation with a mercury-quartz ultra-violet ray lamp. A good substitute for the natural sun bath. Indicated especially when there is fever as the lamp gives little heat.

to take it. If unable to do so the raw food diet of fruits, vegetables and nuts is next best.

As in bone cases, the sun baths or the substitute ultra-violet radiations are of supreme importance. General sun baths should always be used; but if possible to employ, in addition, concentrated rays on the specific lesions, this treatment will be of further assistance. A quartz lens is the best for concentrating the sunlight, since it allows the ultra-violet

rays to pass through the skin. But some benefit will be secured through ordinary glass if necessary to use this. The rays must be concentrated to a point about the size of a dime, this spot to be kept moving over the lesion just rapidly enough to prevent burning. Where the lesion is small, making impossible much moving about, the distance of the lens from the skin may be slowly but constantly increased and decreased so as to vary the concentration of the rays and thus prevent burning. A mild burn will do no harm and may be of some assistance; but as a rule it is best to come just to the point of burning and then shift the concentration. This local application of the rays, as with general exposures, must begin cautiously and increase gradually. In most cases a one-minute application will be sufficient for the first day. This should be increased one minute at a time (daily) up to ten-minute exposures. The local treatment may be taken while in the general sun bath. Cool baths should follow each general sun bath, as has been advised.

If unable to secure the natural sun baths the ultraviolet radiations, both local and general, will be found of much assistance if these are procurable. The general radiations should be given as previously described, but the application of the local treatment will vary in individual conditions. A special lamp is required for the local treatment, using quartz lenses; and, since the technique is rather complicated, the treatments should be given by a qualified medical or drugless doctor. Sometimes the lamp

may be held an inch or so from the skin, and in other cases actual pressure upon the skin may be employed. The length of the exposure depends upon the distance of the lamp from the skin, the reaction of the patient, and the degree of erythema (congestion) desired. Frequently a slight burning is beneficial. It usually is well to rest from the general radiations for a week after every four weeks' treatment. The application of the cool bath is not so necessary after these treatments, but may be employed to advantage, since it should be used sometime during the day, anyhow.

There will be few cases who cannot secure at least some sun baths or ultra-violet radiations, and all that can be should be secured. For those who find it difficult to obtain these light treatments the use of water will be helpful. Steam baths usually are very good. They should not be taken while on a fruit diet, but at other times they may be used twice a week. There are several forms of cabinets for taking these baths; but if the patient is sufficiently vigorous it will be best to use the kind which includes the head, especially when some of the lesions are on the face. Care must be observed not to overdo the steam baths. They should be continued just long enough to induce free perspiration. This may be anywhere from ten to twenty minutes. A cold wet towel should be wrapped round the head during the treatment. Afterward the perspiration should be rinsed off in a warm shower, and the treatment terminated by a cold shower.

For those who do not have the facilities for taking a steam bath the wet sheet pack will be valuable. This may be taken twice a week, and should be followed by a rinsing warm bath and a cold bath—by shower, spray, bucket pour, sponge, or cloth. The method of applying the pack is as follows: Several blankets are placed on a bed, preferably. Then a sheet which has been wrung from cold water is laid over the blankets, and the patient lies down quickly upon this. Then an assistant at one side rapidly brings the near side of the sheet over the near arm and the body and the near leg, tucking it in well; then the far side of the sheet is brought all the way over and tucked in along the outer edge of the near side of the body. It also is folded snugly about the neck and turned up over the feet. The patient is then wrapped closely in the blankets. When this pack is properly applied the patient becomes warm within two or three minutes and will perspire within an hour or less. Usually the patient remains in the pack for two hours. If the reaction is poor, hot water bottles may be placed alongside the body and at the feet until warmth is restored. A cold wet towel should be kept wrapped around the head. The patient may sleep while in the pack if he desires. This is a very powerful eliminator, and is of much assistance in removing some of the soil upon which the germs feed, also in increasing the activity and resistance of the skin itself. It is not equal to the sun bath, but will be of much value where this cannot be obtained.

Dry friction baths and general cool baths should be taken in all cases. In administering the friction the affected skin areas should be avoided. One cool bath a day is sufficient unless taking more than one sun bath a day or except when the weather is unusually warm.

Various special treatments are sometimes employed for the skin lesions, all of which have for their purpose the sterilization or destruction of the tubercles. For this purpose applications of zinc chlorid, pyrogallic acid, or silver nitrate are often used, or the actual cautery with the electric current. Some doctors employ the knife to scrape the parts. None of these methods is equal to sunlight; and since the advent of the water-cooled ultra-violet lamp by which local radiations may be given, even the medical doctors are abandoning these other local measures. In no case are such local applications curative, as they do nothing to remove the causes. Never forget to give chief attention to the constitutional treatment.

In considering the latter let us not forget the use of the mind. Put the mind into every effort made for improving the health, and better results will be secured. One factor which some skin cases have to contend with is the self-consciousness and humiliation which is produced by the appearance of lesions upon the face. This should not be allowed to interfere with progress through giving rise to despondency, fear, self-pity, etc. Neither should it prevent the patient from being out of doors in the

fresh air and sunlight as much as possible. The thing to do is to keep so busy with constructive thoughts and actions that there is no time for the mind to dwell upon personal shortcomings. Realize that the lesions are there for a purpose, and the sooner the causes are removed by right living and right thinking the sooner will the disfiguring spots be removed.

GLAND TUBERCULOSIS

The treatment for localized gland cases will be found to follow closely that employed in skin cases. Usually, rest is unnecessary, and exercise and deep breathing can be taken the same as in a case of skin infection. In the more severe cases, which have been neglected and where there is considerable suppuration with the production of general symptoms, rest for a few weeks may be required. This applies also to tuberculosis of the kidney and of the testicle, which latter often causes considerable pain. In some of these testicular cases a supporter may be sufficient, but in the more severe cases rest in bed is advisable until there has been definite improvement.

In any case, no violent exercise should be taken. Walking, deep breathing, and free-hand calisthenics, as described in the first part of this chapter, will be sufficient. In testicular cases walking may have to be limited even if the patient is able to be up and around. Moderate exercise in a reclining position, however, would be possible and safe in these cases. Deep breathing of fresh air is always particularly

important. There is nothing like air and sunlight for any case of tuberculosis.

In regard to sunlight, the general and local radiations should be used as in skin cases. The rays are concentrated upon the affected glands or upon any sinuses which may have formed. The local ultra-violet radiations are especially good for treating sinuses. Any accumulated pus should be evacuated by squeezing or, preferably, by sterile cotton swabs, before applying the lamp. Discharging sinuses will have to be kept dressed with a bit of absorbent cotton and gauze held in place with adhesive plaster. The dressings must be removed when taking a sun bath or air bath. As much time as possible should be spent in the air bath, even if sun baths are necessarily limited. In tuberculosis of the testicle sunlight or ultra-violet radiations will do much to save a gland that otherwise might be destroyed.

If unable to secure either of these light treatments, cold packs should be used. These are applied to the testicle the same as the cold neck pack is in laryngeal cases or the cold hip pack in hip joint cases, using cloths between the thighs supported front and back (at least front) by a waist band. The pack may be applied once during the day for one to two hours and again upon retiring at night, when it may remain all night or until dry. Upon its removal the covered parts should be bathed with cold water, then carefully dried. If there are no open sinuses the mud pack is of value. Sterilized clay should be employed, wetting it in cold water and

thoroughly coating the affected parts. The clay may be bound on with gauze bandages. The length of application is the same as for the cold pack.

Due attention must be given to the diet. The initial fruit diet may be lengthened to ten days if possible, the same as in the skin cases. The milk diet is just as important as all other cases. If necessary to use a solid food diet care should be observed to drink plenty of water between meals; eight glasses a day will be none too much.

The favorite medical treatment for tuberculous glands is an operation for their removal. In cases which are just starting, where only two or three small glands are affected, this may seem to be of benefit; but since it does nothing to remove the causes of the trouble other glands are quite certain to be affected later on. Then there is always the danger of spreading the infection by the cutting, since the body is in a condition to tolerate further infection. Such operations should be avoided in practically all cases. Today many surgeons are using ultra-violet radiations instead of the knife.

Persistent treatment is required in gland cases, as well as in others, especially if the disease has been allowed to progress to the point of suppuration. However, it will be well worth while, and the patient should be ready and willing to do his best with patience, hope, and confidence.

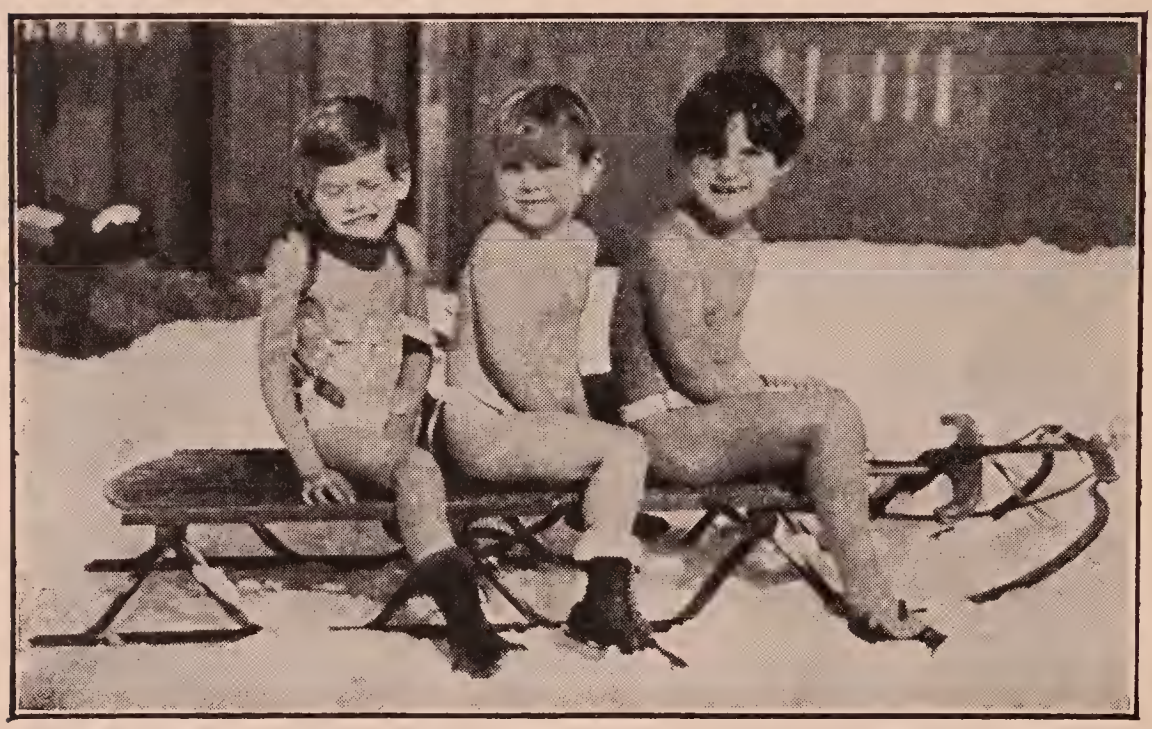
CHAPTER XI

Treatment of Children

CHILDREN differ from adults in a number of ways that are not apparent to the casual observer. It is not merely that they are smaller in size, but their bodies and minds work in a somewhat different manner. In treating children, therefore, it is not sufficient merely to reduce the quantity of food or to shorten the length of a treatment. It is necessary to adapt the measures employed to all the characteristics of childhood.

First of all it should be remembered that the child's body is operating at a higher rate of speed, both organically and muscularly. The breaking down and building up of tissues goes on more rapidly; but always the building up must exceed the breaking down if growth is to take place. This requires more rest, and more food in proportion to the size and weight of the child than for an adult; and on account of the smallness of the organs, more frequent and constant feeding is needed. Do not get the idea, however, that children cannot fast, because they often do it better than adults. But the length of the period of abstinence must be regulated, avoiding fasting any longer than is really necessary. The child has less resistance than the adult be-

cause it has not yet had time to develop much. Therefore it must receive greater protection from the elements, and from contamination by internal or external filth. In spite of this lack of resistance, however, the vitality of the child is high; and, while it will become sick quickly, it will also get well quickly as soon as the habits of living and the en-



Sun baths in the winter time showing how the body may be inured to exposure. The child on the left is a spinal case and is wearing a brace so that he can get around.

vironment have been corrected. One should not get the idea that children are very fragile and must be handled "with gloves," as it were. Their high vitality renders them quite resistant to the ordinary things in their environment. It is only the unusual to which they are likely to succumb. Create the proper environment for the children and instill right habits of living into their minds from the time of birth, and they will have the maximum vitality and

resistance, which will be amply sufficient to protect them against tuberculosis or other diseases.

The treatment of children is simplified to a considerable extent by the fact that the mental processes do not so frequently enter in as causes of disease; nor has there been time for the formation of destructive mental habits which will interfere with progress. The psychology of the child is important and should be given attention, but it seldom presents the problem that is often encountered in treating adults. Children are very open to suggestion and can be trained readily in the right paths.

Of course, children are similar to adults in many ways even though they are different in some other ways, and the same fundamentals of treatment always apply. The greatest modification of treatment will be required before the age of two years, but it is rare that a child so young will be afflicted with a form of tuberculosis. After the age of fourteen most children can be treated the same as adults. It is the period between those ages that will require the most attention.

As far as rest is concerned the same plan as for adults may be employed. Everyone knows that a child requires more sleep than an adult; but the resting plan will give plenty of opportunity for this. While the adult will be merely resting, the child will be sleeping. Children are more inclined to be active, however, and greater restraint may be necessary for a time. The instincts of children usually can be trusted to guide their activities. But when the body

has become diseased so that the instincts are prevented from fully manifesting, the reasoning guidance of the adult will be required. When there is a very definite desire to be active or to rest, however, it usually will be safe to agree, even though reason may speak to the contrary. We cannot always determine accurately just what is going on in the child body, and it is well to remain open to suggestions from the child's instincts. Not often will any conflict arise, and if one follows the general plan already given, using plain common sense, there is little likelihood of any difficulty arising.

It is in the matter of diet that the greatest modification of treatment will be required. The necessity for frequent replenishment of the supplies of energy-yielding and tissue-building foods preclude long fasts. In most cases fasting should not be used at all, the fruit diet being preferable. The length of the fruit diet will depend upon the age, weight, and general condition. For acute cases five days usually will be sufficient, though some cases which are much run down will not be able to take this diet for more than three days. These periods can be repeated, if necessary, after from two to four weeks. Rarely will it be advisable to continue this limited diet as long as seven days at once, and never except in the case of children approaching the age at which adult treatment may be used. For chronic cases three days on fruit usually will be sufficient, repeating it after two weeks if fever persists. The regular repetitions taken every month should be for one or

two days. Quite young children have fasted, or very nearly so, for as much as a week, especially in acute diseases; but in dealing with tuberculosis it is well to compromise between the cleansing and building processes and to feed whenever the condition is reasonably satisfactory, always being careful to use a strict diet.

For this diet, milk again becomes the main standby. It is naturally the diet of childhood, and it is infrequent that any difficulty will be experienced in using it. It may prove a little monotonous for children who have been used to eating a variety of solid foods; but since fruit is used with the milk, by varying the kind of fruit, sufficient change may be secured. Milk so adequately nourishes the body that, in most cases, even among adults there is not the desire for other foods. In any case, monotonous or not, the milk diet should be used if the liquid can possibly be secured. There are few cases where milk of some kind cannot be obtained. It is now possible to get whole milk in the dried form; and, while this is not equal to the fresh milk, it will often be satisfactory for children when plenty of fruit is used, especially if the sun baths are taken regularly. Condensed milk never should be used, and evaporated milk rarely is satisfactory. In cases of necessity it would be worth the trouble to buy and keep a cow or some goats, rather than to do without milk. In those localities where goat's milk can be obtained this should be used in preference to cow's milk, as it is easier for children to digest.

Naturally, the quantity of milk that a child will require will be less than for an adult. The following table gives the maximum quantities for the full milk diet at different ages:

AGE	PER DAY
1 year or so	3 pints
1 to 5 years	1½ to 3 quarts
5 to 8 years	2½ to 3½ quarts
8 to 13 years	3 to 4 quarts
13 to 16 years	4 to 5 quarts

The quantity taken on the first day after the fruit diet will depend not only upon the length of this diet but upon the age of the patient. The same proportion to total quantity should be used as in the case of an adult. For instance, if an adult who will take six quarts of milk per day starts with a glass every two hours, a baby taking only three pints of milk each day will start with only two ounces (one-quarter glass) every two hours. A child five to eight years of age who will take three quarts of milk should start with a half glass (four ounces) every two hours. The feedings should be increased two ounces a day up to six or eight daily feedings, after which the frequency of the feedings increases until the maximum quantity is reached. Thus, a child taking three quarts of milk a day will take a glass every hour, rather than a half glass every half hour. The adult takes the milk more frequently in order to get in the necessary quantity. If these proportions are observed the same directions may be used as for adults.

Hardly ever will a solid food diet be required.

In some skin or gland cases, where the child is old enough to attend school and not ill enough to stay at home, the solid food diet will be more convenient. Even in these cases, however, it would be better to keep the child at home and give milk, at least until there has been marked improvement. Health is more important than education. However, if solid food seems to be indicated in any case, the diet should consist of the same foods and menus as advised for adults unless the child is younger than three years. Of course, the quantities of food must be limited in accordance with the age, always being careful not to overfeed. This is often difficult where children are concerned, but if eating between meals is avoided there should be no trouble. If there seems to be a definite appetite an apple or some other acid or sub-acid fruit may be allowed, but nothing else. If the child is younger than three years the diet should consist chiefly of milk, fruits, cereals, eggs, and cooked vegetables. The raw vegetables are not so important for the young child, and in most cases they should not be used until around two and one-half years of age. The fruit, however, should be taken mostly raw. All cereals should be of the entire grains. One egg a day (preferably the yolk only) is sufficient up to five or six years of age, though if there seems to be a definite need for more concentrated nourishment an additional yolk a day may be given. Any of the cooked vegetables may be employed. Do not make the mistake of using nothing but potatoes or pota-

toes and carrots, or any other extremely limited variety. The green vegetables, such as spinach, kale and onions, and the lighter carbohydrates, such as cauliflower, egg plant, and summer squash, should not be neglected. A really normal adult diet need

Outdoor exercise class for children having a tendency to tuberculosis. Here the combined advantages of the air, sun, bath and exercise are being secured.

not be modified to any great extent for children except in regard to quantities and the proportion of raw vegetables. A fully raw food diet may be employed, however, after three years, if plenty of milk is used.

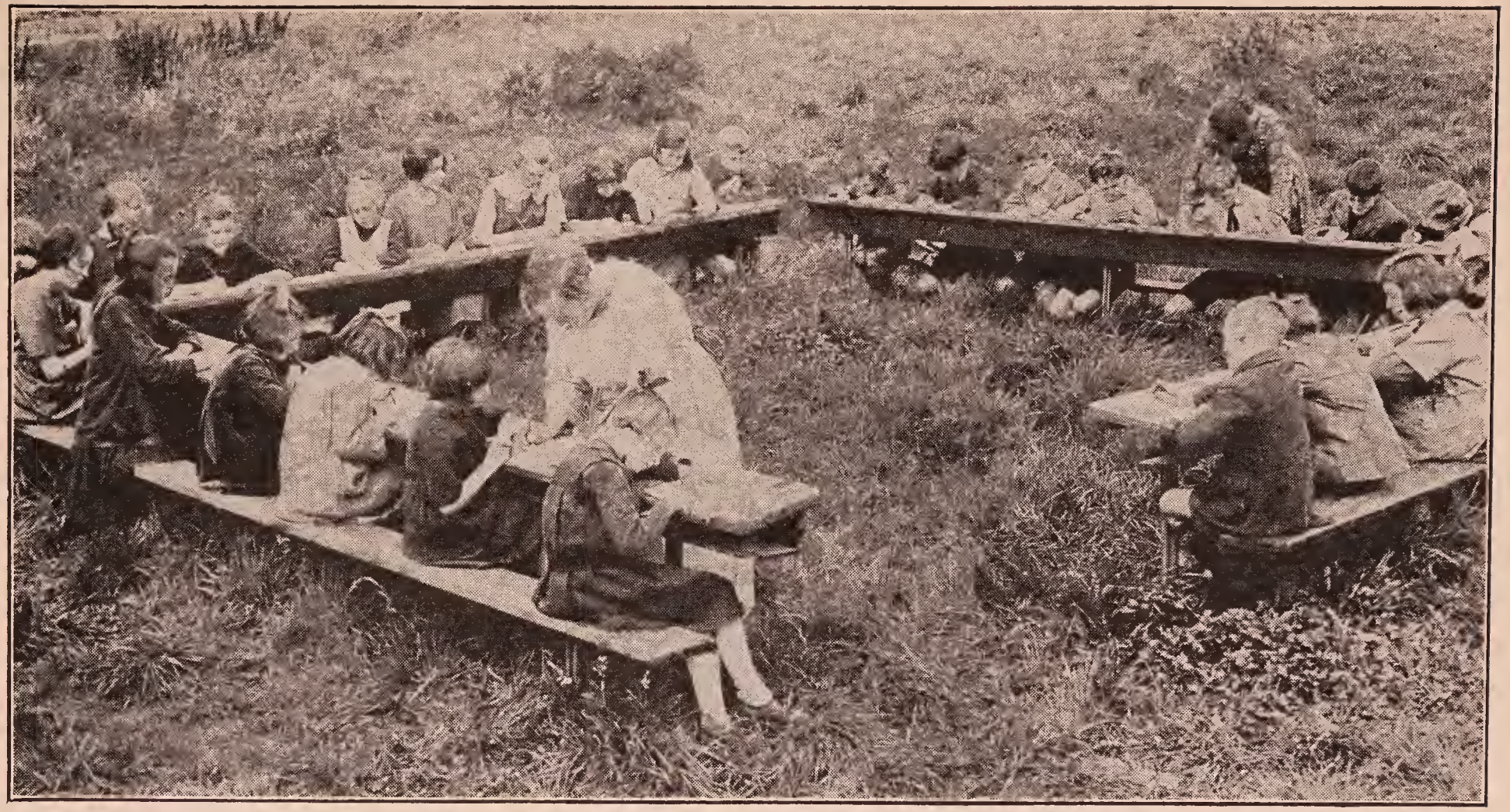
Regarding exercise, this need be given little attention. Rest will be more important for a time, and when ready for exercise the natural activities of the child will be sufficient. Play is the proper

exercise for children, and as much as possible of it should be done out of doors. It is not necessary to employ the systematic walking as in the case of adults. Simply employ the rest periods as has been advised, and then allow the child to run around as he desires. A child will stop when tired, and is not likely to overdo. However, children of a nervous temperament may need to be taught to relax and not to keep going when fatigued. Most children's cases will be of the bones, in which complete rest is indicated, or of the skin and glands in which free activity usually is permissible.

The question of splints and braces requires consideration. Children are inclined to squirm around more or less, even when lying in bed; and this, naturally, causes some motion of the bones and joints. Whether or not splints or braces should be used in such cases will depend largely upon the environment that can be secured. If possible to secure sun baths for several hours a day and to have plenty of fresh air and proper diet there should be no necessity for braces, even in spinal cases. Dr. Rollier does not use them, and he gets good results. However, many of the children of the poor cannot have such a good environment. They may be lucky to get the sun baths or ultra-violet radiations half an hour a day, the air is never any too fresh, and the milk they secure is not of the best quality. In such cases it may be well to employ sand bags or splints in spinal and hip-joint cases until there has been definite well established improvement.

Fresh air and sunlight are as necessary in children's cases as in any others—perhaps more necessary. The air baths and sun baths should be used the same as for adults, except that for children under five years it is generally advisable to start with not more than a two-minute exposure, increasing two minutes a day up to a maximum of three hours daily. In very warm climates the air bath may be continued indefinitely; or in cases where there is not much sunlight the air bath may be continued for the full period mentioned, even though the light exposure is limited. Care must be observed in cool weather that the air bath is not continued long enough to bring about chilling. When exposed to the sun it is easy to maintain warmth even if the air is cool. It is seldom necessary to protect the eyes except where the light is unusually brilliant, as at the seashore, and in cases of children less than two years of age. Older children will instinctively give their eyes any protection that may be needed.

In giving the cool bath after the sun bath or at any other time it usually is prudent to start with tepid water at about 85 degrees and reduce gradually to 60 degrees. The sponge bath or the wet-hand bath is the best for children. If any packs or compresses are needed they are to be given the same as for adults. In giving a general cold-sheet pack or hot-blanket pack, however, it may not be necessary to continue so long, as perspiration is usually produced sooner. Usually ten to twenty minutes of perspiring are sufficient. These treatments will not be



An outdoor school for children having a tendency to tuberculosis. These schools are not as numerous as they might be and are not always well equipped. Better desks and chairs in the above case would permit the pupils to assume better postures.

required very often for children, but in youth they form a valuable part of the treatment in many cases.

The use of mental therapeutics for children consists chiefly in keeping them interested and encouraging them. All children have very active imaginations. These should be appealed to, for the double purpose of keeping them occupied and for building a pattern of a strong healthy body in their subconscious minds. Games of various kinds and, perhaps, easy studies will serve the first purpose. For the second purpose, the child should be taught to imagine himself as being well in every particular, able to do all the things that other children do, and free from all pain or deformity. Whenever they have nothing else to do they can "day dream" along these lines. No one should ever suggest to the child that there is any doubt about recovery. All attendants should be cheerful, patient, and sympathetic. The use of music is often very helpful in entertaining the child, controlling moods, relieving tension, promoting sleep, etc.

In very young children or where there is need for special assistance, suggestions may be given the patient about twenty minutes after going to sleep at night. These should be couched in the first person, using the pronoun "I." For instance one may say for the child "I am breathing, eating, drinking health and strength." "I feel new life and energy flowing through me, and all the functions of my body are constantly growing more normal." "I am now tearing down the sick cells in my body and

building up new healthy ones." "I am cheerful, happy, and confident." Any similar ones which seem to meet the particular needs may be employed. Do not be doubtful about the child understanding. You are not talking to the conscious mind but to the guiding intelligence within the body that never sleeps, that always knows what to do.

Children should always be treated at home if at all possible. They need the care of those most interested in them, and familiar surroundings will be a great help. For them to go away may lead to homesickness and undo all the good of the new environment. Children respond readily to rational treatment, and if even a reasonably normal environment can be created at home they will soon recover. The parents or guardians should not worry or allow the children to see them doubtful or afraid. Be confident, keep busy, give the child the necessary care but no more, and all will be well.

CHAPTER XII

Complications and Their Treatment

IN a properly treated case of tuberculosis of any kind there should be few, if any, complications. Complications usually result from neglect, improper treatment, or indiscretions on the part of the patient. This is especially true in the matter of diet. For such patients we can only do our best and wait for the time to come when suffering shall have taught them wisdom, at least discretion. However, complications will sometimes occur no matter how careful the patient is or how good the treatment. These include hemorrhage, strains from coughing, and colds. Hemorrhage is really a symptom rather than a complication; but since it complicates the case when present and is sometimes absent even in severe cases, I am considering it here. Other possible complications, such as pleurisy, empyema, digestive disturbances, neurasthenia, drug habit, etc., should not occur if care is observed.

HEMORRHAGE

Hemorrhage is an escape of blood from the blood-vessels. In tuberculosis it usually occurs only from the lungs or the intestines. When it occurs

from the lungs it may be due to oozing from small vessels or to rupture of a large vessel, either because of destruction of the vessel wall by a tubercle or because of strain from coughing or sudden violent exertions. When it occurs from the intestines it is generally due to destruction of blood-vessel walls by tubercles or ulcers. The quantity of blood lost may be anywhere from a mere trace to several ounces. However, it is not such a serious complication as many people suppose. Under proper treatment hemorrhages will be absent or small and easily controlled. Of course, in a neglected case a large hemorrhage may be serious; but proper treatment will control it. An occasional streak of blood in the sputum or feces need be given no particular consideration. If there is enough to indicate a real hemorrhage, however, special measures will be required.

If the patient is not already resting he should go to bed at once and stay there for several days, or longer if the condition seems to require it. If already in bed, care should be observed to be more quiet than usual, and even talking is to be prohibited for several days. Nothing but fruit should be taken for food, and that only as specially desired. Until the discharge of blood ceases, water taken should be cold, or from cracked ice melted in the mouth. If there is much discharge or if it continues for more than a few minutes an ice-bag may be placed on the chest, or cloths lifted from ice in a basin or lightly wrung from ice water may be used. Fresh air is important, as usual, but no deep breathing of

any kind should be employed for several days. It is well to continue the fruit diet for at least one day, and in severe cases for two or three days. No hot drinks are to be taken, and hot food is avoided for a day or two after discontinuing the fruit diet. If sun baths are being taken they should be discontinued for several days; but ultra-violet radiations may be continued as usual, except for the one day on which the hemorrhage occurred. Either milk or solid foods may be resumed after the fruit diet, using only half the usual quantity for the first day and increasing gradually thereafter.

Hemorrhage from the intestines should be treated as above, except that if the ice-bag is required it is placed over the abdomen instead of the chest, and if enemas are needed cool water, at about 70 degrees, is used. Ice-cold cloths may be used in this case, also, instead of the ice-bag; but if cloths are used they must be changed every minute or two, as it is necessary that they be cold.

STRAINS FROM COUGHING

Coughing severe enough to produce strain usually occurs only in throat cases, where there is much local irritation and where swelling interferes with swallowing and elimination of mucus. Choking, also, is a possible source of strain in these cases. Coughing may be severe enough to produce strain in advanced lung cases or where the mucus is unusually sticky and tenacious. Careful general treatment should soon relieve the cough sufficiently that possi-

bility of this complication will be removed. The abdomen is usually the part strained.

When a slight strain occurs it will require only rest. If the strain is sufficient to produce rupture (hernia) a properly fitted support must be worn, as the special exercises for this condition cannot be taken until the general health has been greatly improved. Rupture is quite unlikely to occur when a patient is resting. A good means of preventing rupture, when there is severe coughing, is to draw the thighs slightly toward the abdomen, especially when lying on the back. This places a slight tension upon the muscles in the regions where rupture may develop, and this usually is sufficient to prevent this mishap. The more probable condition to develop from coughing is prolapsus of the abdominal or pelvic organs. This may occur even if the coughing is not severe, if it is constant. The muscles, ligaments, and other tissues being already weakened by the disease, the marked downward pressure occasioned by frequent coughing may cause the organs to drop below natural position. This is possible even when the patient is lying down much of the time. If the general condition will permit, a few tensing exercises for the abdominal muscles followed by a cold compress for three minutes will help to keep the internal structures in tone. It also is a good plan to assume the knee-chest position or to lie on the back with hips elevated on a pillow for five to ten minutes at a time several times per day, both for prevention and correction. Retraction of the

abdomen—drawing in the abdomen and drawing up the diaphragm—should be practised frequently during the day. It is an excellent preventive and corrective of prolapse of organs.

The lungs, as well as the abdomen, may be strained by violent coughing. This may produce hemorrhage, and in any case there will be some soreness. The hemorrhage should be treated as already described. The only thing necessary for the soreness is rest and the general treatment. If the cough is obstinate or if there is much soreness it may be well to strap the chest with adhesive plaster, as in case of pleurisy, in order to protect it. It is not well, however, for the patient to fear that he will tear the lung tissues every time he coughs. These tissues are quite elastic, and even when there is considerable scar tissue there will be sufficient "give" to prevent much trouble. As the proper treatment is continued there will be less and less cough.

Another possible effect of excessive coughing is vomiting. The contraction of the abdominal muscles and the movements of the diaphragm may so upset the stomach that regurgitation occurs. A reduction of food will be helpful in these cases. The vomiting seldom occurs except in those patients who overeat and overload the stomach.

COLDS

Colds will sometimes result no matter how careful one is to eat properly, avoid undue exposure, and harden the body through air baths, sun baths, and

cold baths, and fresh air. They are not so frequent, however, if the patient can live out of doors; and, of course, proper treatment will keep them at a minimum. If a cold should occur it should be treated as colds developing at any other time. The fruit diet, with daily enema, should be adopted until the most of the symptoms have subsided. The regular treatment for the tuberculous condition should then be resumed. It is advisable to rest during this time even though one has reached the point where exercise is permissible. The occurrence of the cold indicates that there has been some accumulation of toxins or lowering of the vitality, and it is best not to take any chances of having a set-back. A few days on fruit, with rest, will practically always set everything right again.

PLEURISY

This condition often causes considerable trouble in cases where the lungs are affected. It may arise from infection from a tubercle located close to the surface of the lung, because when tuberculosis is already present all parts of the body are rather susceptible to infection of any kind. A neglected cold also may be a factor, since the pleura, in common with the lungs, has had its resistance lowered. If the causes of the tuberculosis have not been removed pleurisy may develop at any time, for it is due to the same fundamental causes. But whatever the cause, strict treatment will be required.

Absolute rest must be observed, and nothing but

a limited amount of fruit juice with plenty of water is to be taken until all morning fever is gone, and, if the weight and strength will permit, until fever at any time of the day has disappeared. A hot-blanket pack at the start of treatment is very helpful. After that hot water bottles are applied over the affected parts until pain has been relieved. Coughing should be restricted as much as possible. The patient will make every effort to do this, because coughing produces keen pain in pleurisy. Fresh air is of supreme importance. If coughing is very painful and continues in spite of treatment, the chest may be strapped with adhesive plaster. No more strapping is applied, however, than is necessary to give relief. Usually only one side is affected. The adhesive is passed from the opposite side of the spinal column around the affected side and over the breast bone. The plaster should be one and one-half or two inches wide. It is drawn quite snugly when the chest is as small as possible from exhaling, and as many strips are applied as necessary, overlapping each one slightly. Generally it is well to start near the bottom of the chest and work upward. New plaster should be applied each day, especially if there is much perspiration. If the weather is cold, care must be observed not to chill the patient while applying the strips. The strapping is discontinued as soon as the condition will permit.

If the pleurisy is of the "moist" variety and there is much swelling from the effusion of serum, a hot chest pack may be applied daily until this symptom

has been relieved. Twenty to thirty minutes is usually long enough for this pack. Hot-water bottles may be placed over the pack to maintain heat. It is generally advisable to avoid strapping in these cases.

If the case is very bad or not properly treated, pus may accumulate within the pleura, giving rise to the condition called empyema. An operation may be required for this condition if the pus does not drain or is not soon absorbed; but usually the above treatment will be sufficient.

There is considerable likelihood of adhesions forming after an attack of pleurisy. The inflammation, on subsiding, leaves scar tissue binding the two layers of the pleura together, or sometimes the scar tissue may extend from the pleura to the diaphragm or up into the lungs. This causes pain and some limitation of the motion of the lungs or chest walls or both. After all symptoms of the pleurisy have subsided the practise of careful deep breathing, gradually increasing the depth of the breaths taken, will partly break up these adhesions and partly stretch them so that they will cause no noticeable trouble. When the condition has progressed far enough to permit general exercise, further improvement in the adhesions may be obtained.

DIGESTIVE DISTURBANCES

There should be little or no digestive disturbances when the right treatment is followed. They arise, chiefly, from the orthodox practise of overfeeding

and the use of medicines for suppressing symptoms. Improper combinations of foods, highly seasoned foods, the use of tea, coffee, and cocoa, or the overuse of concentrated foods may be causes. All of them will be avoided when the suggestions given in this book are followed. However, practically all tuberculous patients have rather weak digestion, and disturbances may occur even on a careful diet. The various modifications of the milk diet which may be used for special disturbances while on that diet have been described. If there are any special foods or combinations of foods that seem to disagree when on solid foods, these should be avoided until the condition has improved, even though they would be all right under ordinary circumstances. If there is much gas in the stomach after a meal, sipping a little of quite hot water will usually dispel it. If the gas is in the intestines, an enema may be taken, even though the bowels are moving well or an enema has been used previously during the day. Hot abdominal compresses are helpful, also.

If there is nausea, vomiting or other more marked symptoms, a fast should be taken for a day or more, even when one of the regular fasts or fruit diets has been recently taken. Hot water should be used during this time. After this, greater care must be observed in adhering to all the rules of eating, and the quantity of food should be limited for several days. If there is considerable nausea without vomiting it may be well to drink several glasses of warm water and then place the finger in the throat to in-

duce vomiting. This method may be used, also, for washing out the stomach in the morning before taking anything for the day, if the previous day's rations have not seemed to "set" well. Such an occasional stomach washing is of value in any case. The use of several glasses of water makes vomiting surprisingly easy and free from distress.

Diarrhea not due to tuberculous infection of the intestines should be treated by a fast of a couple of days, with the free drinking of water and a high enema each day to remove thoroughly the offending material which the body is endeavoring to throw out. Less rough food should be eaten for a few days thereafter. Diarrhea, which may occur on the milk diet, has been discussed in an earlier chapter.

The regularly repeated fruit diets I have recommended will do much to avoid digestive disturbances; and, of course, it is much better to prevent them. Avoidance of overeating, and strict attention to diet and all phases of treatment I have described will do the rest of the preventing.

NEURASTHENIA

When a patient is first told that he has tuberculosis, this information is very depressing. Hence, all patients are possible subjects of neurasthenia. Fortunately, however, most of them react quickly and become quite optimistic. Usually it is only those who are improperly treated or whose environment is very bad that develop well marked neurasthenia. Overfeeding, overresting, drugging, and exile from

home are especially likely to be causes. Failure to observe complete sexual rest, and various forms of sexual perversion are prominent causes. Financial or other worries may lead to neurasthenia. But whatever the cause, it is necessary to give careful attention to every phase of the right treatment in order to secure favorable results.

Of course, removal of causes will be of primary importance; but some of them may be found very difficult to remove. Homesickness, financial cares, poor environment, etc., may be almost impossible to correct, and the patient will have to adapt himself to them. Hence, mental treatment is particularly important. Autosuggestion and the study of practical psychology will be found very helpful in cultivating hope, confidence, faith, trust, determination, persistence, cheerfulness, and patience. Determined practise in the expression of these mental attitudes, however, is the only way to get the benefit of them. The patient should realize that upon doing so depends his recovery and his happiness. Inspirational and instructive reading also will be of much assistance, as it will not only keep the patient's mind off himself but will concentrate it upon constructive thoughts and will build the foundation for a helpful philosophy of life. When a patient knows how his mind and body works, and something of how to care for them, he has greater confidence in his ability to control himself and his environment.

Two other things that are of value are the use

of color and music. The best colors with which to surround the patient are yellow, orange, and white. Flowers are always excellent. In regard to music, this must be adapted to the needs at the time. Practically everyone reacts to certain tunes in the same way, and everyone knows which ones are stimulating, which soothing, which depressing, and which uplifting. Often a radio is very helpful, though it must be used with discretion, since there is so much clatter and irritation in so-called "popular" music and "jazz."

After all, preventing and treating neurasthenia consists merely in giving careful attention to all the measures I have suggested in previous chapters, that the body may be cleansed of irritating toxins, the vitality increased, the environment kept as favorable as possible, and the cure expedited.

DRUG HABIT

There is really no excuse for the development of this habit by tuberculous patients, or by anyone else, for that matter. If the various narcotics were not employed for suppression of the tubercular cough, as is so frequently the case, there would be no opportunity for the development of drug addiction. The use of local anesthetics in extreme cases of laryngeal tuberculosis is very unlikely to produce such a habit. It is the use of "cough medicines" and "sleeping powders" which is really to blame.

Once such a habit has developed it may be difficult to break it, for the patient is not in a condition to

endure strenuous eliminative treatment. The use of mental suggestion is here of much value. It can be given after the patient has gone to sleep, as suggested in the chapter on treatment of children. However, for best results the patient himself also should use suggestion, constantly assuring himself that he has perfect control of all his thoughts and actions and has no desire for anything but the normal things of life. Use of the drug should be stopped immediately if at all possible. A fast of a few days should be taken, with large quantities of water, and sweating should be employed as far as the condition will permit, to remove the accumulated poison and thus reduce the physical craving. Of course, careful and constant attention must be given to the general treatment at all times, to remove the symptoms for which the drugs were given.

TUBERCULOSIS MENINGITIS

I am considering this as a complication of tuberculosis because it is almost always an extension from tuberculosis in some other part. It occurs chiefly in children, and is most often a complication of scrofula or spinal tuberculosis. It is an inflammation of the membranes covering the brain (the meninges), and is a very serious and, usually, fatal disease. However, it seldom develops in properly treated cases.

The first symptoms are irritability, headache, insomnia, and loss of appetite. As the condition advances the headache becomes more severe, and

then develop vomiting and convulsions. The temperature varies from 99 degrees in the morning to 102or 103 degrees in the afternoon, and the pulse is quite irregular. This stage usually lasts about twoweeks and is followed by depression, with slow pulse, lowered temperature, and stupor alternating withdelirium. Collapse, coma, and death generally follow. This is not a pleasant picture, but it emphasizes the necessity for proper treatment at the start. When this is done there is a reasonable chance of recovery.

The treatment can be summed up in a few words: no food except possibly a little fruit juice, rest, fresh air day and night, enemas daily, and cold wet-sheet pack every day until fever is broken or every other day if very weak. If the patient is weak but without fever it may be well to give a hot abdominal pack for about thirty minutes in place of the cold wet-sheet pack. If the spine is not affected to such an extent as to make movement inadvisable, a hot half-bath with cold affusions to the upper spine and chest may be used. This bath is taken by having the patient sit in about twelve inches of hot water while cool water is poured over the spine and chest from a large vessel, followed by brisk friction to bring about reaction. The affusion may be repeated two or three times and the bath continued for five to ten minutes. If the symptoms seem to be developing rapidly the bath may be repeated several times during the day, always with care to see that recuperation from one bath has occurred before

giving another. If the patient becomes much weakened there will be no use in giving another bath, because he will not have the strength to react; and it is the reaction that is of benefit. In such a serious condition as tuberculosis meningitis, the chief dependence must be placed upon the patient's own inherent vitality and resistance. The policy of "hands off," using treatments only as very necessary to control the most severe symptoms, is a good one to follow, though it is often difficult because others are inclined to think that nothing is being done for the patient. The truth of the matter is that rest, fresh air and water will do more for the patient than anything else.

When complications develop in any case, greater care and patience are necessary on the part of both the afflicted one and his attendants. It is always much better to avoid complications, as tuberculosis is difficult enough without them. The important point to remember is that early removal of causes will do away with the necessity for complications, because these appear only when necessary—the same as do the usual symptoms of tuberculosis. Will power is necessary in following the prescribed regimen every day, and some patients will need the warning of complications before they will employ this very necessary mental attribute. The prudent ones, however, will realize that a little "moral suasion" at the start will pay big dividends in early, uncomplicated recovery.

CHAPTER XIII

After-Care of Tuberculosis

THE after care in any case of tuberculosis is always important. Convalescence is usually slow. It has required all the energy which the body was able to generate in order to eliminate the causative toxins and repair the damaged tissues; and it will take a little time for a sufficient surplus to be accumulated to give the patient that resistance which will be necessary before he can return fully to all the activities of everyday life. Therefore, it will be advisable for the patient to observe care in respect to every phase of living for some time after the tuberculous lesions themselves have healed.

The patient must not think that because the imperative necessity for rest is past or because the milk diet is no longer specially needed, he can immediately be as active as he desires, eat everything that pleases his fancy, and expend his energies as he pleases. Precautions must still be observed to regulate the diet, get plenty of fresh air, cultivate the sunshine, graduate the exercise, secure adequate rest and sleep, and think the right kind of thoughts. It will always be necessary to diet, to a certain extent; that is, one cannot return to his old diet, because it was not a normal one and it may produce

recurrence of the disease. He must live indefinitely on natural foods. This will not be denial, but a pleasure, after having employed rational methods of treatment. The normal diet consists of fruits, vegetables, nuts, whole grain products, honey, milk and milk products and eggs. Raw foods are always important.

If one can arrange to sleep outdoors indefinitely it would be an excellent arrangement. Sun baths are good even for a healthy person. Directions for graduating the exercise have already been given. Every effort should be made to secure nine hours of sleep at night, and one rest period during the day if possible. Do all these things with the idea that you are promoting health and not fighting disease, that you are improving your efficiency and not merely avoiding punishment. Let all your thoughts be constructive in character.

Other factors that will need consideration are occupation, social activities and amusements, climate, etc. Regarding occupation, if one has restored his health through natural methods of treatment to the extent that the body has been cleansed and the vitality increased, it is not so important to choose a vocation that is especially favorable from a health standpoint. Of course, if this can be done it is always best; but if one lives rightly he should be able to follow almost any occupation without injury to his health, except possibly those which are extra hazardous from the standpoint of lung affections, such as caisson workers, miners,

glass blowers, steel workers, cigar makers, etc. Some cases will need to return to work at the earliest possible moment on account of finances. These should choose work which will permit them to continue their regular healthful regimen as far as possible. The vocations of gardener, landscape artist, tree surgeon, and chicken farmer are especially valuable. Others which are usually listed as favorable include banker, barber, cabinet-maker, clerk, clergyman, draftsman, lawyer, librarian, merchant, optician, teacher, etc. But these usually do not give enough fresh air or exercise. Of course, if the hours of work are not long one can make up for these defects when not working. For those in good condition when they start work the various trades are good, such as bricklayer, carpenter, electrical worker, mechanic, and paperhanger; but plastering, painting, and plumbing are not so good. Other good occupations include masseur, canvasser, collector, salesman (not clerk), reporter, and farmer. In most cases it is well to avoid working as a janitor, garage mechanic, stone cutter, miller, typesetter, or undertaker, because of the various foreign materials which one is likely to breathe in or absorb in other ways.

In regard to social activities, the less "indoor sports" indulged in the better. A reasonable amount of visiting with congenial friends, or even dining with them if they eat sensibly, is all right; also an occasional card party, dance, or theatre party. Avoid late hours, however, and let your recreations

be out of doors rather than indoors. Hiking, bathing, boating, golf, or a mild game of tennis are all good. You may be warned against any form of activity that uses the arms or causes deep breathing; but when you have prepared for these by the graduated walking and other exercises already advised, you may disregard all such warnings. Quite naturally, any new form of activity must be started with care and increased gradually, and excessive fatigue is always to be avoided. Under any circumstances such outdoor activities are never likely to be so dangerous as dances extending into the "wee sma' " hours of the morning, "stag parties," poker games, petting parties, or even spending long hours in a theatre. Let your amusements as well as your other habits of living be constructive rather than destructive.

If the patient has left his home and made a radical change in climate with the idea of hastening his cure, it would be well to remain in that climate until a perfectly normal condition has been restored, or sometime thereafter if possible. Return to the former climate should always be accompanied with such changes in the habits of living as may be necessary. For instance, if one has changed to a cold climate and is returning to a hot climate, it will be necessary to eat more lightly and use more fruits and vegetables. If the opposite conditions obtain it may be well to increase moderately the amount of fats or starches in the diet. When changing to a colder climate it is always important to avoid stay-

ing indoors too much. Be sure to get the same amount of fresh air as usual, even if it is cold. Most cases which go away for treatment seek high altitudes. In returning to a low altitude it will take a little time to become acclimated again; but if care is observed to eat lightly and get plenty of fresh air there should be no trouble. Air baths and sun baths are especially important at such a time, as they afford some of the stimulation which is felt in a high altitude. As a rule it is not well to seek treatment at an altitude of more than 2,500 feet, as a greater height will be of no special assistance and it is easier to return from the lesser altitude to the native climate and low altitude.

While it is necessary to observe care during convalescence this should not be carried to such extremes that the patient becomes afraid to make a move or to change his routine in any way. Such extreme care leads to neurasthenia, which makes real progress very difficult. As soon as fear enters in there is bound to be trouble. Do what is necessary to do not because you are afraid to do otherwise but because in so doing you are following Nature's laws, which make for health and happiness.

I have seen some patients who, after taking the conventional rest cure, were afraid to make the slightest unusual exertion, such as carrying a traveling bag from their room to a taxi. Others who were supposed to be cured were unable to walk a block without getting out of breath, and, in consequence, were afraid to do anything but ride. After having

"fed up" according to directions, patients are often afraid to miss a meal or make any reduction in the quantity of food taken even though they have no appetite, for fear that they might lose an ounce or two of weight and plunge headlong into a relapse.

Such exaggerated precautions are by no means necessary. The conditions and changes usually feared are not likely to cause trouble when the proper treatment (from which fear has been excluded) has been taken. I remember the case of one young man who secured a position in a grocery store after completely recovering from his trouble. He did all the necessary physical work, including lifting quite heavy boxes, without fear and without harm. Some of his friends attempted to dissuade him, warning him that such work might cause a relapse. But he refused to be frightened and went ahead with confidence, continuing to take proper care of himself. This is the right attitude. The thing to do is to use plain common sense, give particular attention to avoiding the disease and forget about coddling and its effects.

CHAPTER XIV

Prevention of Tuberculosis

THIS book is written primarily for those who already have tuberculosis. They are not so interested in prevention. But I cannot leave out this important subject entirely. Anyone who has had tuberculosis, even the most misanthropic, will not wish anyone else to have it; and some information on prevention will help them to help others. Then those who are in attendance on the patient will also wish to know how to prevent developing the disease.

The prevention of tuberculosis is largely a matter of education. The people must learn how to live. Disease is a result of improper habits of living. If we learn the right kind of habits and then practise them persistently we will be protected from all diseases. Avoid causes and there will be no effects. Hence, if you wish to prevent tuberculosis read the chapter on causes and avoid all of these causes. This sounds simple enough; and truly it is not too difficult, but many people make it so by refusing to make up their minds to live rightly. This is where education comes in. Constant study of right habits of living will, in time, create a desire to live correctly. This business of teaching people how to live has been my work for many years, espe-

cially through *Physical Culture Magazine* and my Health Library.

While a careful study of the chapter on causes will give you much information on how to prevent tuberculosis, I wish to call your particular attention to certain points The first is the necessity for avoiding fear. Humanity as a whole has been so accustomed to fearing something or other ever since the dawn of creation that it is often very difficult not to fear the things that most people consider evil. Tuberculosis usually is regarded as such a terrible disease that it is almost instinctive to fear it. Great care must be observed, especially by those attending a tuberculous patient, to keep their minds so occupied with constructive thoughts that they will be constantly protected from the fear thoughts. The directions I have already given for autosuggestion will be of the greatest assistance in this respect. Also, constant repetition of the thought (which is a fact) that tuberculosis cannot develop in a healthy person will tend to produce calmness, poise, and confidence, especially when it is realized that health is a natural result of right living and within the reach of all.

After conquering fear and also while doing so, careful attention must be given to cleanliness, the use of fresh air and sunlight, the practise of regular exercise and proper diet. Sunlight is of special value in dispelling fear, as well as germs, and in keeping the vitality high. Everyone should use it whenever the opportunity offers. Attendants of

tuberculous patients should take the baths the same as do the patients, and should use the ultra-violet rays if sunlight is not available. It hardly seems necessary to reiterate the necessity for fresh air, but it is so important that I must do so. One who lives largely out of doors and either sleeps outside or has plenty of ventilation at night is not likely to develop tuberculosis even though his other habits of living leave much to be desired. Fresh air is especially important for relatives and attendants of the patients. They will probably be outside considerably with the patient; but they should also sleep out if at all possible. Breathe the fresh air deeply, to get the most benefit of it.

BREATHING EXERCISES

I am giving herewith a number of breathing exercises that will serve as examples. Variations of these are easily devised if one finds constant use of the same ones monotonous.

1. Exhale fully, then inhale slowly through the nose, expanding the lower lungs first, then the middle portions, then the upper.

2. Inhale, carrying in mind the thought that you are breathing in life, energy, health, and strength. Exhale, carrying in mind the thought that you are blowing out all impurities and undesirable thoughts.

3. Exhale fully, inhale (through the nostrils) to comfortable fullness, hold the breath for two seconds, then exhale suddenly and completely through the open mouth.

4. Inhale through one nostril, holding the other closed with a finger. Exhale through the same nostril. Reverse and breathe through the other nostril.

5. Inhale fully, then exhale in a series of puffs through the pursed lips.

6. Inhale fully, then exhale through the nose by humming the sound "m" at the pitch of "E" above middle "C."

7. Inhale while raising arms sideward upward overhead, stretching well upward, and exhale while lowering the arms.

8. Extend the arms forward shoulder high, then pull backward, bending the elbows, as though pulling a chest weight until the hands are in front of the shoulders. Inhale during this movement and exhale as the arms are again extended forward.

9. Draw the shoulders forward while exhaling, then inhale as you roll them upward and backward.

10. While in reclining face-up position with arms at sides, inhale as you raise the arms overhead, exhale as you lower the arms.

Cleanliness is a very important factor and extends not only to the inside and outside of the body but to the clothing, bed clothing, house, and general environment. Germs cannot exist where plenty of water, soap, air and sunlight are employed. A cleansing bath should be taken twice a week, and a dry friction and cold water bath daily. The clothing should be changed as frequently as necessary, in no case wearing it so long that it becomes unsightly or has an unpleasant odor. Underclothing

and hosiery may be changed every day to advantage, though this may not always be absolutely necessary. After washing, the clothing should be dried out of doors in the sunshine. The same applies to the bed clothing. The blankets and comforters or fur robes, if these are used, should be aired and sunned frequently. A vacuum cleaner is best for cleaning rugs, draperies, and furniture, as this creates no dust and cleanses thoroughly. All garbage and other wastes should be burned or otherwise satisfactorily disposed of at regular intervals, so that none accumulates. In cities where there are sanitary plumbing arrangements and garbage is collected regularly, individual garbage incineration is not so necessary. Attendants of tuberculous patients, however, should see that the sputum cups or napkins are burned. The patient himself should observe care always to employ such cups or napkins, for his own sake as well as others—and not expectorate in any open receptacles or in any place where the expectoration cannot be completely destroyed.

Nothing takes the place of exercise in keeping the elimination active, and when this is accomplished there will be a clean body inside. Most of us are inclined to neglect exercise, either from laziness or because we think we have no time for it. But if one wishes to keep well one will have to see that some exercise is taken regularly and daily. This also is especially important for those in more or less close association with someone having tuberculosis. Those looking after the patient may be very busy

and may be inclined to think they have no time for exercise. But they must manage to get at least a walk every day. Trained nurses always insist upon time off for walking every day, and it is a wise precaution. An hour of such exercise will do much to prevent a lowering of the vitality or an accumulation of poisons which might lead to tuberculosis. Then it only takes ten minutes or so to go through a little series of calisthenics. Added to the walking this will take care of the requirements of most persons who actually do not have time for more.

In regard to diet, the important points to remember are to secure plenty of mineral elements and vitamins, and not to overeat. For this purpose the raw fruits and vegetables are the most valuable. Milk is a very effective protective agent; but since it contains a lot of "solid food" there is danger of overeating if one drinks much of it with regular meals. Often a good plan is to make one meal a day of nothing but milk and acid or sub-acid (or both) fruits. The necessary raw vegetables may be secured by always including a large salad in one or two meals a day. Nuts and egg yolks are better forms of protein than meat, or even than cheese, because they contain a larger proportion of the mineral elements. Therefore, let them supply most of your protein. Carefully avoid all the dietetic errors listed in the chapter on causes of tuberculosis.

Of course, for some people it is very hard to secure the proper foods at all times and to get plenty of fresh air and rest. Poverty, isolation, a severe

climate, etc., may all interfere. Hence, to be really effective in preventing tuberculosis it is necessary that social conditions be improved. The means for doing this cannot be adequately covered in a book of this kind. Education is a primary factor. Ignorance is responsible for most of the world's troubles —ignorance of Nature's laws and how to use them. Even the poorest people could live better than they do if they knew how. Vicissitudes in climate can be discounted by proper living habits that will adjust the individual to his environment. Proper education along health lines will enable anyone to make the most of the facilities he has at hand, no matter how limited, and thereby render tuberculosis and other diseases much less likely. Poor people who are constantly driven to earn a living are especially prone to dissipation of various kinds. They feel that they must crowd the most sensual enjoyment into the shortest period, since they have so little time for what usually are called pleasures. They must be brought to realize by proper education that sensual pleasures are not the real and enduring ones, and that they lead only to sickness, misery and death. The simple wholesome pleasures can be enjoyed by all. When we learn to be satisfied with these we shall have learned real wisdom. After all, what pleasure can compare with the pleasure of health? The tuberculous patient particularly will answer most emphatically "None!" So let those who wish to avoid tuberculosis take the patient's word for it and live rightly in every respect.

CHAPTER XV

Equipment for Treating Tuberculosis

TUBERCULOSIS is a disease that calls for some special equipment for treatment. In treating most diseases the patient will find it readily possible to secure the advantages of Nature's forces —fresh air, sunlight, water, proper food, exercise, etc., and no special arrangements or specific equipment will be required. But in tuberculosis the necessity for both fresh air and rest and the importance of sun baths or ultra-violet radiations, together with the need for extra sanitary precautions, so complicate the matter that at least some equipment is both necessary and helpful. Within reason, the more of such equipment the patient can obtain the more mental peace will he have, because everything will be more convenient, and taking the necessary treatment will not require so much mental or physical exertion. Naturally, recovery will be quicker under these circumstances. The expenses involved need not be great, as various substitutes usually may be employed for specially manufactured articles. However, whatever expense is involved will be worth while, because of the greater effectiveness of the treatment. Of course, a patient with sufficient de-

termination, patience and self-control can get well under very adverse conditions. No one should feel that recovery is impossible because he can not obtain some desired bit of equipment. The patient should obtain what he can and avoid worrying about the rest.

The first question which always comes up when a

A winter scene in the Adirondack Mountains. This section is famous as a health resort for tuberculous patients. Note the sleeping porches on the house. They are inexpensively made and fully serve their purpose. The sliding glass windows may be opened as much or as little as desired.

person finds that he has tuberculosis is whether or not sanitarium treatment will be instituted. Three plans are open to the patient. He can go to a sanitarium, or to a health resort, or he can stay at home. The medical doctor usually will recommend them in the order named—go to a sanitarium if you can; if not, then go to a health resort; and if this is impossible, then do the best you can at home. In most cases I would recommend just the opposite procedure, though of course there are advantages

and disadvantages in all plans. The patient will have to weigh these one against another and decide which plan best suits his own individual needs, desires, and purse. What is excellent for one may be contraindicated for another. Sometimes there will be some special feature of the case that will decide the matter immediately—such as when the patient is too sick to move. In this case he will be saved considerable mental exertion.

In considering which plan will be the best the following information may prove helpful:

In regard to sanitarium treatment, this plan will be automatically vetoed in the majority of cases, for there are not enough sanitariums to go around. There are probably not more than one-third as many available sanitarium beds as there are patients. Consequently they all have a waiting list, and one may be dead before he can be admitted. Because of this demand most such institutions limit their cases to mild ones, which they are fairly certain can recover. There are very limited accommodations for desperate ones. Most patients with such cases must shift for themselves, as under the circumstances they are not considered sufficiently "good risks"—they pull down the percentage of cures, and, therefore, are not favorable advertising. As a matter of fact, these are the cases which most need sanitarium treatment, for there they can secure the constant attention and the favorable general environment which they need so badly.

The chief advantage in tuberculosis sanitariums

properly conducted and equipped, is that all the necessary facilities are readily available. There are sleeping porches and "cure" porches, hospital beds and reclining chairs, sanitary equipment, sun parlors and ultra-violet lamps, special diet facilities, constant supervision, nursing when needed, education, and controlled amusements. Everything is devised for the special care of the tuberculous patient, and the entire routine is arranged for his benefit. At first glance this form of treatment would seem to be ideal. However, it is not the equipment, but the use that is made of it, that produces results.

Nearly all of the sanitariums which treat tuberculosis exclusively are operated strictly along medical lines. All those which are maintained by the government and by charitable agencies for the use of poor people are so conducted. Consequently, while they have the equipment, the best use of it is not made. The patients are overfed, given drugs, which they would be better off without, and are instilled with the fear of germs and exercise. If it were possible to get the right treatment at sanitariums this plan of treatment would be ideal; but there are few such places in the country. It is for this reason that I place the sanitarium last instead of first. Further objections to the sanitarium plan include the expenses and the necessity for leaving home. The free or moderately priced sanitariums are so overcrowded that there is little chance of getting into one when it is necessary. Leaving home may not be so objectionable in some cases, and even has its

advantages; but there is the trip to be made, the extra expense, the anxiety about those at home, and other such drawbacks to be considered.

The plan of going to a health resort (not a sanitarium) has, perhaps, more advantages than disadvantages. The expense may be as much or greater, but you usually can get the treatment that you want and need, by the simple expedient of treating yourself. Usually you can find a medical doctor who will be willing to work with you if desired, or there may be naturopaths in the health resort you choose. The two chief objections to the health-resort plan are the necessity for leaving home and of taking someone along to do the nursing during the bed-rest period. To go to a nursing home at a health resort is little if any better than going to a sanitarium; you must be free to get the food that you need. If possible to overcome these disadvantages the health-resort plan will be very helpful. You will have a favorable climate, plenty of fresh air, sun baths or other treatments, good milk, and, above all, people will not look upon you as a danger to society. Your affliction will be taken as a matter of course, and the natives and other patients will work with you instead of against you.

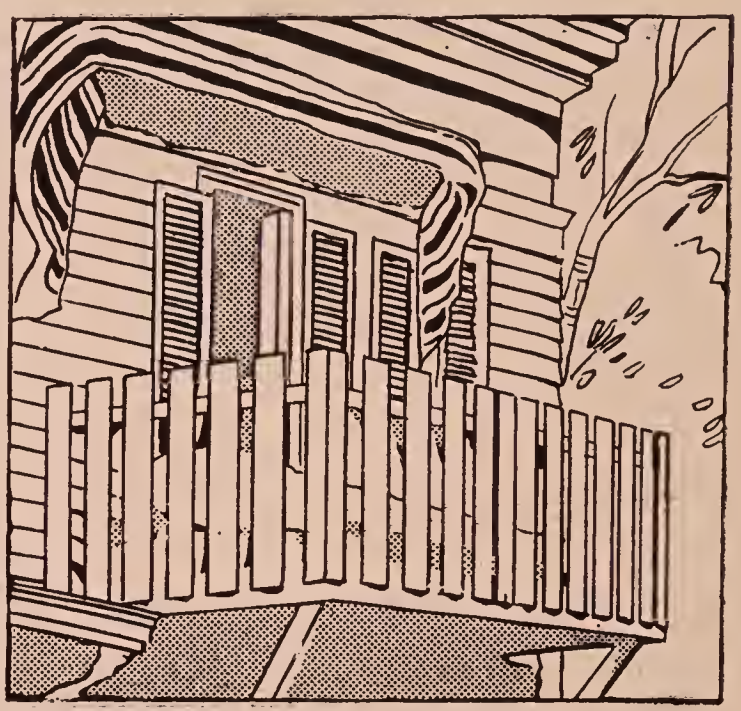
However, if reasonably favorable conditions may be obtained at home it usually will be found best to stay right there. First of all, the expense will be less —or some of the money "saved" may be expended on home equipment. If you are not too sick you may be able to secure some light work which you

can do at home even while resting. This will keep your mind occupied and help pay expenses. To the great majority of tuberculous patients the matter of expense is of great importance. Only a comparatively few of such cases are in a position to disregard this important item. To those who must consider expense it is of primary importance that this matter be settled as soon as possible, because there are few things which interfere more with progress than worry about money matters. Decide what you wish to do, borrow some money if necessary, and then forget about money matters in the calm conviction that you will be able to make up for your losses without trouble, because you are going to get well and be better in health than before. Health is more important than wealth, and no one realizes it any more than one who is flat on his back or "weak on his pins" with tuberculosis.

By staying at home you will not have to become acclimated either during treatment or after the cure; you will be among familiar surroundings, with no danger of homesickness; and you will have those who care most for you to look after you. By making a few special arrangements for fresh air and sunlight you will be in a position to take the necessary treatment in peace. The advantages and disadvantages of each plan must be considered in relation to the individual case; but I believe it is usually preferable to make an effort to remain at home rather than to make an equal effort to go away. For this reason I am giving a number of suggestions in

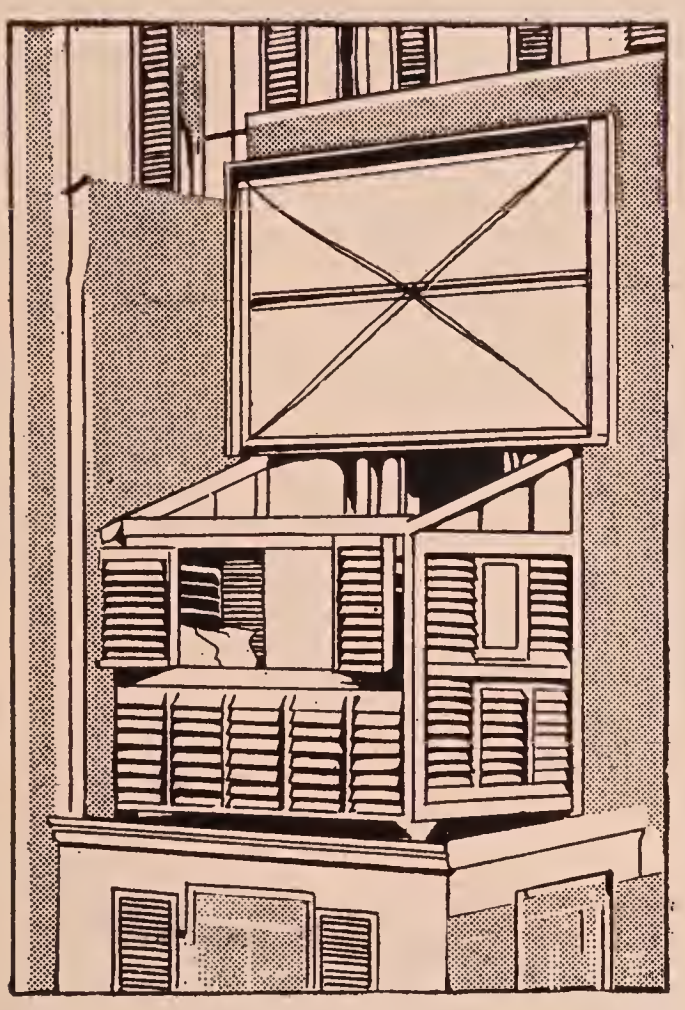
this chapter whereby home conditions may be made to meet the patient's requirements.

The first necessity will be to arrange for fresh air. If you already have a sleeping porch you are fortunate. Simply make that your living quarters, and you will get all the fresh air necessary. If you have no such porch but can build one, you will be equally fortunate. Such a porch should have windows or other openings on three sides. These should extend from close under the roof to within two feet of the floor. In fact, the more open space the better. Of course, there should be screens to protect from insects, and glass casements or canvas awnings to protect from the rain, snow or high winds. The glass casements (hinged windows that open like doors) are the most convenient, but they are expensive, and there is a tendency to keep them closed too much. Because they give one full benefit of the window opening they are preferable if used properly. But any window is satisfactory if used properly.



An easily constructed sleeping porch which is suitable for country locations but can only be used in fair weather.

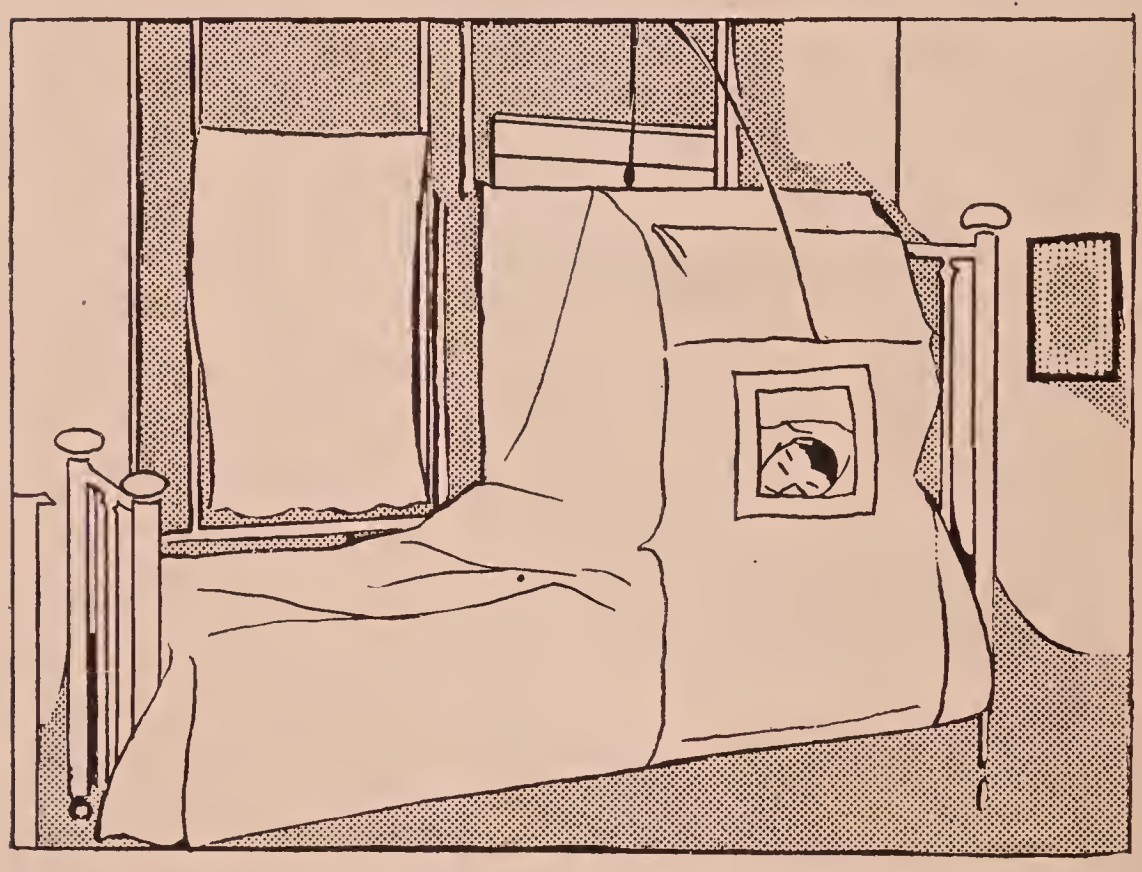
The canvas awnings are generally the best except in very cold climates. The roof should be solid and weather-proof; but if it can be arranged to be lifted when desired it will make sun baths possible on the porch. Linoleum makes an excellent covering for the floor of the porch. The bed should be of iron, and there should be weather-proof coverings to be used in case of emergency. These are the necessities.



An excellent form of living and sleeping porch, though of rather complicated construction. The sides have blinds like shutters so that even when the porch windows and roof are closed the ventilation is good.

The luxuries include special lighting and heating arrangements, additional furniture, radio, toilet facilities, etc. As a rule it is better to keep the furniture very simple, and the porch should be unheated most of the time. If the patient is not confined to the bed all day no heat will be required. However, an electric heater often comes in very handy. A gas or oil heater should not be used, as they extract large amounts of oxygen from the air.

If unable to arrange for a porch of any kind a well-ventilated room should be selected. Windows should be on at least two sides of the room, and the more the better. They should be open to some extent constantly, and to the fullest extent as many hours daily as possible. If the room is not any too well ventilated by windows it would be well to em-



An indoor tent giving many of the advantages of the out of doors for bed patients. Especially valuable in the city where sleeping porches are rare and privacy is necessary. The window may be closed and the tent lifted when the patient is eating, being bathed, etc., so that the room is not chilled.

ploy a window tent while sleeping at night. There are a number of these on the market at moderate prices. They usually are well equipped with means for protection from bad weather; but it is advisable not to make too free use of these, or the tent will

be of little value. When fully opened they allow a supply of air almost as good as that obtained when sleeping out of doors. The tent can be used during the day when desired.

Various inside tent arrangements, also, can be devised. The bed must be placed close to the window and the tent built over the head of it. The window is then kept open both top and bottom. This arrangement does not give the supply of air that

Another easily constructed, light, yet weather-proof tent for outdoor living. Of value mostly in good weather as when closed there is not sufficient ventilation.

the outside tent gives, but it gives greater privacy, and in some cases may be more desirable. The chief advantage of the window tents and inside tents is that they permit the room to be kept warm in cold weather. This is a considerable advantage when space is limited or when facilities for quick heating are not available.

In a climate where the weather is warm the year

round the outside individual cottage or shack, which consists of little more than a floor and a roof, is very good. The same may be used in colder climates by enclosing part of the building for dressing quarters. Tents are seldom so satisfactory because they are more likely to be damaged by wind and rain and are quite hot when the sun shines on them for some time. However, these drawbacks are less conspicuous with strong tents double-roofed, with ventilating space between the two roofs. A tent with side walls seldom gives as much fresh air as an ordinary bedroom. Whatever arrangements may be required in certain circumstances, every effort should be made to approximate as closely as possible outdoor living conditions.

After having arranged for fresh air the next important thing is the sun bath. The chief difficulty here will be in securing the necessary privacy. Those who have a back yard screened from the public view will be fortunate. All they will have to do is to spread a blanket on the grass and lie down. In a less private yard a small space may be walled in with canvas. If the surrounding buildings are high the best place would be the roof or an upstairs unroofed porch. Here, also, the side walls may be erected if necessary. Each one will know his own individual circumstances the best and can make whatever arrangements are necessary for privacy, always remembering that the sunlight must not be obstructed if any benefit is to be derived from nude exposures to it.

Where outdoor sun baths are impossible, either because of lack of space or privacy, or because of cold weather, or because the patient is confined to bed, the baths can be taken indoors as has been described in the chapters on treatment—through the lowered top sash of a window. If one has a sleeping porch, the roof of which may be lifted, that will be found very convenient. If unable to arrange for the bath in any other way it may be taken while

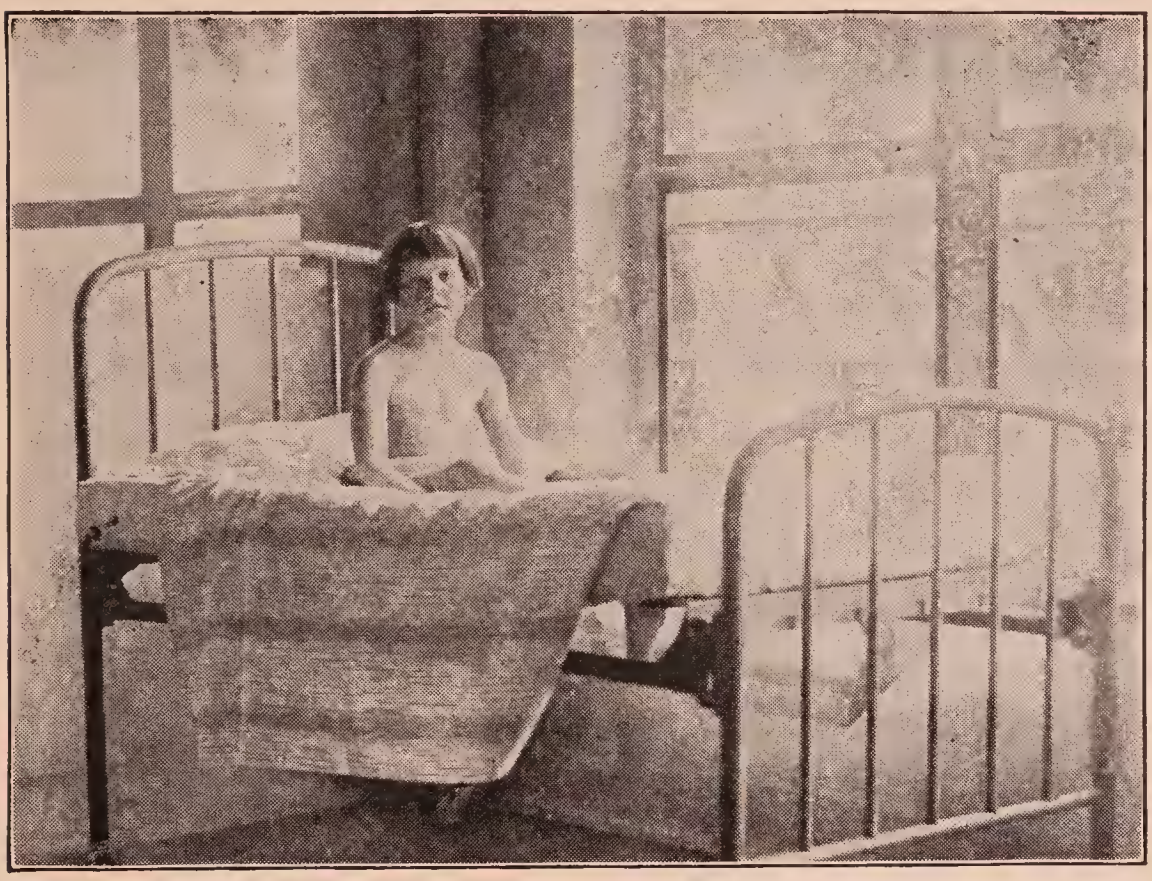
A good tent for outdoor living. It has windows in each end, which are covered with netting so that the tent is well ventilated even when the front flap is closed. Good for all kinds of weather.

the body is covered with netting or some very loosely woven white cloth. Baths so taken will be better than no baths, though considerably inferior to the nude baths. In any case do not allow the remarks or opinions of the neighbors to deter you from getting your sun bath. Under present conditions of prudery and affected modesty it may be necessary to make some concessions to convention, but let it be as little as possible.

Fortunately, within the past few recent years there have been developed special glasses and glass substitutes that permit passage of the invisible ultra-violet rays of sunlight, which ordinary glass reflects and absorbs. A new glass is made by at least two companies, and at least two glass substitutes are made. The new glass is crystal clear, hence as transparent as ordinary (sheet and plate) glass, though the manufacturers of at least one of the new glasses makes, also, a translucent (partially transparent) glass and a translucent glass in which is imbedded a wire screen—for use where strong, wire glass is required. The glass substitutes consist of light wire mesh work or screens (for strength) covered with patented compositions. These resist the weather remarkably well, but naturally are not as durable as are the new glasses (and ordinary glass).

By experimentation it has been found that when fowls are exposed to sunlight through the new glasses growth and all other processes of the body are increased as perfectly as when the bodies are exposed directly to ordinary sunlight; also, that these processes are greatly promoted when the bodies are indirectly radiated—that is, when the sunlight does not reach them directly, but reaches their quarters through the new glasses. This proves that the new glasses permit passage of all the vital health-building and health-protecting rays present in sunlight. Some hospitals and sanitariums have had rooms and roofs fitted with such glasses, and others are fitting rooms, roofs and porches with them.

Experiments made with the glass substitutes at the same time experiments were being made with the new glass proved that, while the substitutes seemed to be less satisfactory for radiation than the new glasses, they were far superior to ordinary glass. Fowls exposed to the light coming through



Showing how a natural sun bath can be taken indoors if the proper glass is used in the windows. Ordinary glass such as now used for windows does not permit the ultra-violet rays to pass but a special glass is now manufactured that will.

the glass substitutes made far better growth and resisted rickets far better than control fowls exposed even to bright sunlight coming through ordinary glass—proving that most of the vital rays of sunlight passes through the substitutes, though not all as in case of the new glasses. The substitutes for glass are designed chiefly for fowl raisers, raisers

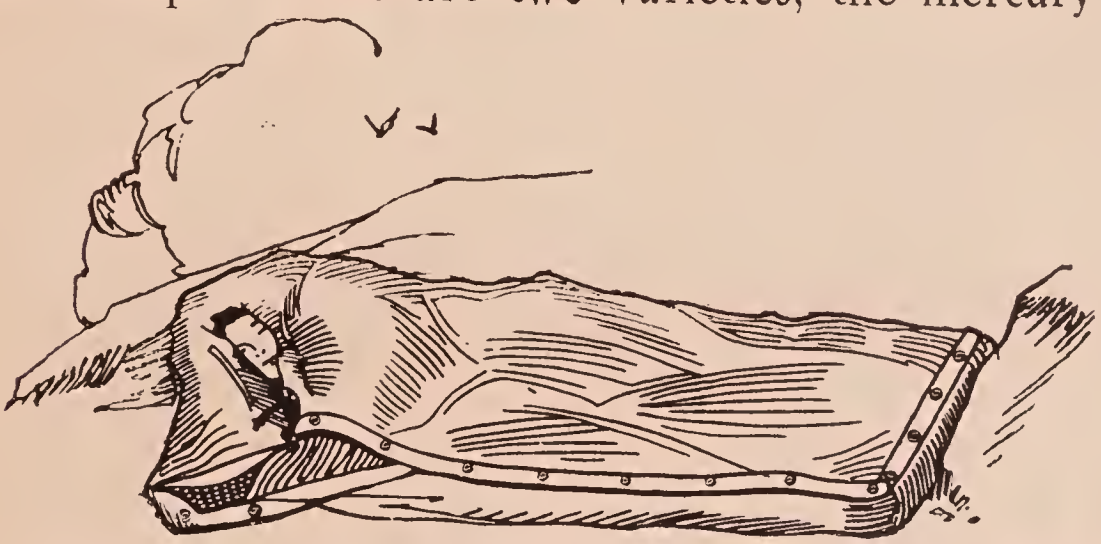
of vegetables and flowers under glass, and in animal husbandry. But there is no reason why they cannot be used satisfactorily in many homes. They are cheaper than ordinary glass, while the new glasses are much more expensive than ordinary glass, in fact, are prohibitive in cost to many people.

The windows of even one room of a house easily could be fitted with either the new glass or glass substitutes, for the treatment of tuberculosis—or rickets or any other deficiency disease. A rear room, or a rear porch, or even a lean-to or improvised hut in the back yard could be covered or surrounded wholely or partially with either a new glass or a glass substitute. Living rooms could be provided with new glass in their windows, as a health-protective measure. Many uses and methods of use will be presented to the reader, I am sure. The glass substitutes can be used where privacy is desired.

Doubtless the expense of production of the new glasses will be lowered in time, with quantity production. This will put them within reach of many people who now cannot secure them and who must use the glass substitutes if any change from ordinary glass is to be made. But without doubt these inventions constitute a great step forward in the prevention and treatment of various disorders due to, or made possible or intensified by, deficiency of the vital sunlight rays, perhaps especially including tuberculosis and rickets.

If artificial sunlight must be used it will be well for the patient to secure a lamp for his own use,

that he may have it when needed. The ultimate expense will be less, also. The lamp will probably be required for a considerable time, and the rental charge of one would soon equal its purchase price. Many times it is possible to secure a second-hand lamp at a considerable reduction. As long as the burner is not too old it will be satisfactory. Or one may be able to secure a second-hand lamp and equip it with a new burner at less than the cost of an entire new lamp. There are two varieties, the mercury-

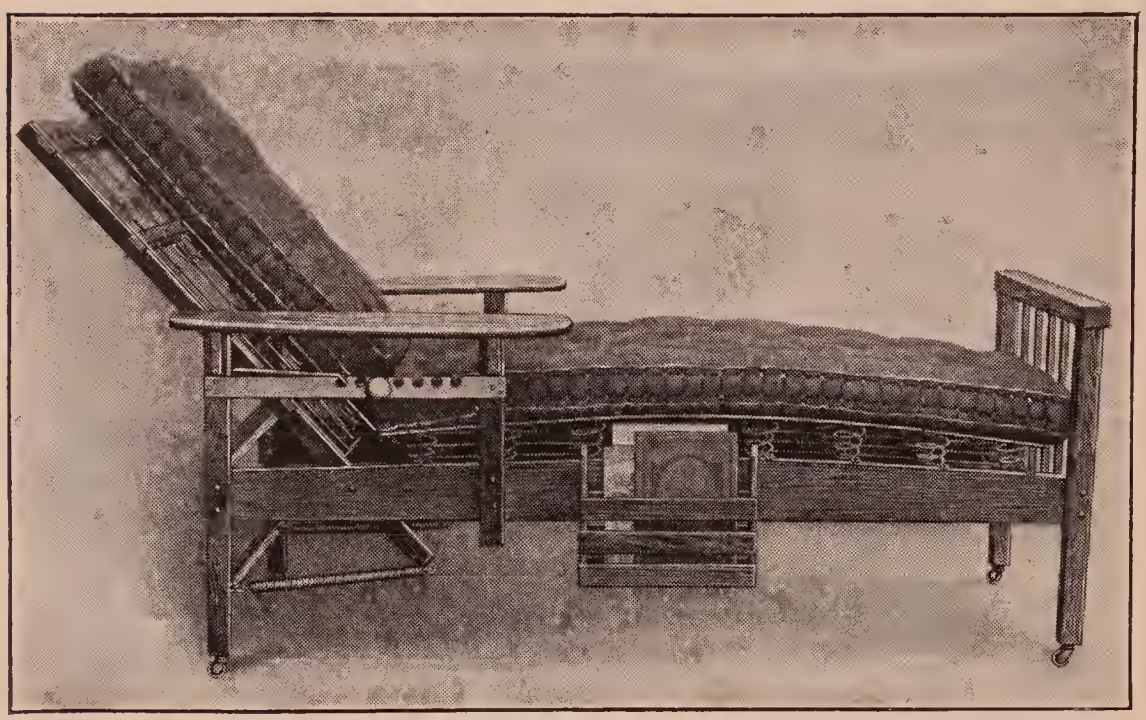


An excellent style of sleeping bag, which can be placed directly on the ground even if it is snow covered as the bag is moisture proof. Very good for those who have no sleeping porch.

quartz and the carbon-arc. The former is more convenient to use, but the rays of the latter are considered to approximate more closely the natural sunlight. In cases where there is fever the former may be slightly better, as it gives less heat. However, recent improvements in the carbon-arc lamps have made them safer and more convenient to use. It would be advisable for the patient to secure information on both varieties before deciding which best

meets his particular needs. For local radiations the water-cooled mercury-quartz lamp usually is the best; but since these lamps are more difficult to use, and even more expensive than those for general radiations, it is best to secure from a doctor what treatments are necessary.

For patients who are up part or much of the



Special reclining chair for the use of tuberculous patients. Considerable rest is required at the start of treatment and such a chair will be much appreciated.

time, a reclining chair is a great convenience. This, of course, is not a necessity, as the bed or any easy chair may be used. If economy is an important factor the special chair may be omitted. If one is secured it should be of substantial construction yet not too heavy to be easily moved about. An ordinary folding beach chair is seldom very satisfactory. The best chair to get is one designed for the purpose, known as a recliner. There are several on the mar-

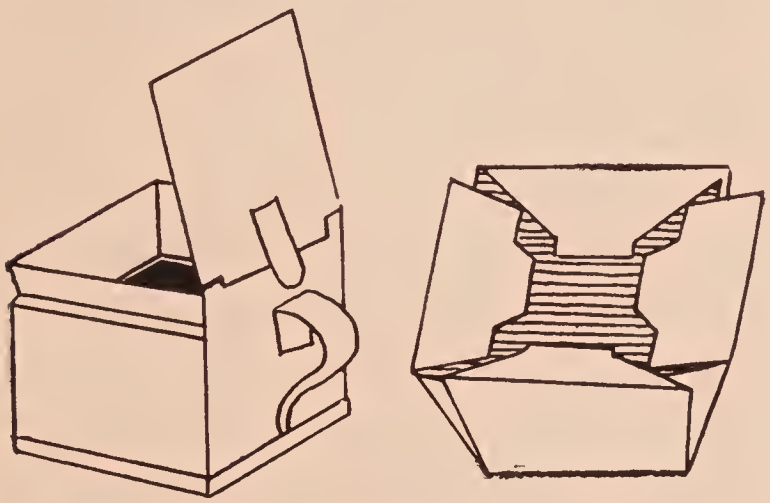
An "Eskimo" suit, made specially for those who are living or sleeping out of doors. Such a heavy woolen garment is not so good for sleeping but is excellent when resting outside in cold weather.

ket, any of which should be satisfactory. The chief difference is in luxury of appointments and excellence of materials.

Clothing is an important factor for patients taking treatment in cold climates. As I have stated before, the amount should be kept at a minimum; but when living outdoors with the temperature at or near zero, some considerable protection is necessary. Fur robes or coats are to be preferred, but heavy woolens will answer. An auto robe or steamer blankets may be used for the reclining chair. A good substitute for fur robes or heavy blankets may be made by placing five or six layers of newspaper or heavy tissue paper between two pairs of blankets and knotting the whole together with yarn after the manner of quilting. Woolen caps which pull down over the ears should be used to protect the head. When sleeping out in severe weather a sleeping bag will be a great help. If one of these cannot be obtained, down quilts and woolen blankets may be employed, as these are light, but warm. Stone jugs filled with hot water are good to place at the feet if the circulation is poor. These are familiarly known as "pigs." If necessary a hot-water bottle may be placed on the back, also. Electric heating pads may be used. It is advisable to get along with as little of this artificial heat as possible; but the body should not be required to expend its precious energy in combating cold. Bed socks may be necessary for the feet in very cold weather. When resting outdoors

during the day one may wear "foot warmers" made of sheepskin, which pull on over the shoes.

The sanitary equipment required includes the fountain syringe, a bed pan for bed cases, and sputum cups. The latter are made in various designs and of various materials. There are two general types—those made of paper which can be completely burned, and those having a metal or leather case in which paper cups are inserted. These cups are necessary chiefly for those patients who are in a position to walk about and be up most of the time. For cases which are confined to bed and where economy is a factor, paper napkins or ordinary toilet paper may be used, each piece as used being deposited in a paper bag. The bag should be removed after a very few hours and burned, and replaced with another. It is not advisable to make much use of handkerchiefs, as they are difficult to cleanse. Also, as they must be laundered so frequently and vigorously they soon wear out.



A handy sanitary sputum cup. The cup is on the right and the container on the left. The cups are made of pasteboard and can be removed frequently and burned.

It may seem rather strange to include books in equipment for the treatment of tuberculosis, but I believe they are important. I sincerely hope that

this book will be considered by the patient a very important and helpful part of his equipment. A monthly health magazine, also, is a considerable help, as it is a constant reminder of the necessity for right living and a regular inspiration that helps to keep up the hope and courage. *Physical Culture Magazine,* other health magazines, and periodicals devoted to practical psychology and spiritual healing, all are good. The mind needs food as does the body. Reading of the proper kind will help much in maintaining the proper mental attitude. Of course, some lighter reading, also, may be permitted for amusement. This should not be especially exciting. Short stories usually are to be preferred to fiction books, as one will be less inclined to read to excess. The patient will be surprised to find how little spare time he has, even when resting in bed. By the time he has done all the necessary things, observed the rest periods and done his inspirational and instructive reading, there will be little time left. This is as well, for reading merely for the sake of reading uses up considerable energy through use of the eyes and the appeal to the emotions, and gives little or nothing in return.

A very important part of the "equipment" of the patient will be the doctor and the nurse. It is not always necessary to have a doctor if the patient is well versed and to some extent experienced in the application of natural methods of treatment. But as a rule it is desirable and beneficial to have some guidance to relieve oneself of the full responsibility.

The doctor will also keep a check on the progress made, by means of special examinations which the patient could hardly make himself. Ordinarily I do not recommend specialists, as they usually know only one thing. But in the case of tuberculosis a specialist is valuable, for the reason that most of them have had the disease themselves, have been "through the mill," and are more likely to understand the patient and to be open to new ideas in the treatment of the disease. There are all too few practitioners of natural methods, or medical men who believe in and use natural methods, hence most patients will have to depend upon the so-called "regular" doctors. Try to find one who is willing to work with you instead of merely issuing orders. Quite a few are becoming interested in diet now, and a really broad-minded medical man will be glad of the opportunity to try the methods of treatment we recommend.

It is seldom that a trained nurse will be required. A relative of the right kind can look after the patient's needs during the period of bed rest, which should not be long when the proper methods are used. If necessary, a practical nurse may be secured. The trained nurse usually is medically trained and is too much inclined to look with disapproval on the use of natural methods of treatment. Whatever attendant is secured, however, it is important that he or she, as well as the patient, read this book so that there can be more complete coöperation. It is

especially important that such an attendant be patient, cheerful, optimistic and healthy.

All the necessary equipment for the patient's course of treatment should be planned and secured as soon as possible in order that he may have his mind free to devote all his attention to getting well. Problems of all kinds should be kept from the patient as far as possible, as a calm, peaceful, unhurried and unharried opportunity to get well will be of the greatest assistance.

CHAPTER XVI

Medical Treatment of Tuberculosis

THE present medical treatment of tuberculosis includes many good points, such as rest, fresh air, ultra-violet radiations, and more fruits, vegetables and milk in the diet than formerly. But it also contains some bad points that it would be well to omit. I have included this chapter in order to acquaint the patient with some of these, that they may be avoided.

Some years ago all kinds of drugs were tried in an effort to "cure" tuberculosis. One by one they were discarded, but the last to give up the ghost was creosote. This is still used in some cases, though it is admitted that it is not a cure. The doctors recognize the fact that they have no drug or other agent which has a selective action on the tubercle bacillus and will kill it without injuring the body. Even if they possessed such a medicine the causes of the trouble would still be present, and more bacilli would come or some other disease would develop.

The present trend in the medical treatment of all diseases is toward the use of serums and vaccines rather than drugs. Many of these have been tried for tuberculosis. The only one which has any

reputation left at present is tuberculin, and that is good (?) only in "selected cases." The question might well be asked, why, if it is a real help, does it not assist all cases? I believe the truth of the matter will be found to be that those cases which have the vitality to react with an extraordinary effort to throw off the tuberculin may at the same time throw off some of the toxins causing the disease, and thereby secure improvement—but only at the expense of a considerable loss of energy.

The widest use of drugs in tuberculosis is for the suppression of symptoms. To be sure, the best doctors use them very sparingly; but there are plenty who find it much easier to give a drug than to do a little work on the patient, such as applying packs and compresses. There are many drugs that are used. Aspirin often is given for the relief of pain in pleurisy or other conditions. This causes a fast heart, so digitalis is given to slow it down. Atropin is employed to check the night sweats. These should be let alone, as the sweats assist in eliminating toxins. For cough, codein, chloroform and the bromides frequently are given. For diarrhea various combinations of bismuth are frequently employed, and in severe cases morphine or opium may be administered. Ergot is used when there is a large hemorrhage. Various "tonics" are employed much too frequently, especially for stimulating the appetite. When the appetite is destroyed by overfeeding, a tonic is given to stimulate it, with the result

that all sorts of digestive disturbances occur. The best way to avoid the necessity of refusing such medication is to give strict attention to the diet and other measures I have suggested.

In spite of all their failures to find a medicine or vaccine to overcome tuberculosis the doctors are still searching for a "cure." They realize by now that only Nature heals, yet they still imagine that they may find some wonderful remedy that will make it unnecessary for the patient to pay his debt to Nature by strict adherence to right habits of living. They have seen that the use of natural methods is most effective in tuberculosis, but they do not give these methods any credit for being effective in other diseases. They seem to have the idea that they are depending on them merely because they have nothing better. It would seem that any thinking person could easily discern that if natural methods or right living are effective in such a serious condition as tuberculosis, when all else has failed, they must be the best, the right, and the only methods for eliminating *all* diseases. I hope I have succeeded in convincing my readers of this fact, because upon this conviction depends their future health and happiness.

In regard to surgery, I have discussed this to some extent in other parts of this book. It has been totally discredited in lung cases, but is still used to a considerable extent in bone, gland and, sometimes, skin cases. However, its use is decreas-

ing since the introduction of the ultra-violet lamps, and it is to be hoped that it will soon be discontinued entirely. Cutting out effects can never remove causes; the disease will break out in other parts, or some other abnormal condition will develop. When the body needs extra elimination it must have it if life is to continue.

There is another special treatment that is sometimes used in severe cases, known as artificial pneumothorax. This consists of collapsing the lung by the introduction of gas, the idea being to give the lung absolute rest. Natural pneumothorax sometimes results from an ulcer within the lung eating through an air passage and one layer of the pleura, allowing air to enter between the pleural layers, where it collapses the lung by its pressure. Symptoms are pain, shortness of breath and collapse. In most cases recovery results by healing of the ulceration and gradual absorption of the air. Such a natural collapse of the lung occurs only in severe and advanced cases, and it is only in such cases that artificial pneumothorax is employed.

This is well, for it is truly a last resort and can be used only under certain circumstances. For instance, the other lung must be fairly sound, as all the work of breathing and respiratory elimination will be placed upon it. If this lung is not in good condition the extra work may make it much worse, and the patient's condition as a whole will be more serious. If the patient has had pleurisy, with the development of adhesions, these may prevent the

collapse of the lung either partly or entirely. The effort to collapse such a lung and the shock of the treatment may make such a patient worse. Hence, it will be seen that this treatment is quite dangerous and should usually be avoided. I am ready to admit, however, that in some cases it may be helpful, especially if the patient is one who will not take proper care of himself. In this case, however, the relief is only temporary, because the wrong habits of living soon produce further trouble.

The method of bringing about artificial pneumothorax is to plunge a hollow needle into the chest far enough to penetrate the outside layer of the pleura, after which nitrogen gas is injected gradually through the needle. From 200 to 800 cubic centimeters of gas are employed. Ordinary air may be used, but the nitrogen gas usually is preferred. As the air is gradually absorbed the injection needs to be repeated, at first every four to six days, but later only every four to six weeks. The lung may be collapsed for as long as a year. Gradual withdrawal is advisable.

But after all is said and done, the chief reliance in overcoming tuberculosis must be placed upon the ordinary forces of Nature—fresh air, sunlight, proper food, water, rest, and exercise in its place. Nothing can excel these in efficiency. These make up our natural environment; and since it is through misuse or disuse of our environment that disease is brought about, the most effective way to overcome disease is to make proper use of the environment.

No other method will suffice. If the patient will have absolute confidence in the healing power of Nature and will patiently and confidently adhere to right habits of living he will not be disappointed. Symptoms may arise from time to time, but one should not allow his confidence to be shaken. Remember what I have said about symptoms being curative efforts, and realize that a little discomfort may be necessary during the process of getting well. It is the price we pay for our former indiscretions.

No one desires to have tuberculosis. But if the proper mental attitude is maintained the disease may be turned into a blessing, for in the process of getting well the patient will learn how to live, how to control his thoughts and actions, and will reach a true appreciation of the beauty and value of living close to Nature. Never again will he be inclined to stray so far from the path of healthful living, and the knowledge and experience he has gained will be of value to him all through what should be a long and useful life.

[THE END]