Morris Sidney Bergen

Books by Richard C. Cabot

PUBLISHED BY

HOUGHTON MIFFLIN COMPANY

A LAYMAN'S HANDBOOK OF MEDICINE. With Special Reference to Social Workers.

WHAT MEN LIVE BY.

SOCIAL WORK. Essays on the Meeting-Ground of Doctor and Social Worker.

A LAYMAN'S HANDBOOK OF MEDICINE

A LAYMAN'S HANDBOOK OF MEDICINE

WITH SPECIAL REFERENCE
TO SOCIAL WORKERS

BY

RICHARD C. CABOT, M.D.

Author of "What Men Live By"

WITH ILLUSTRATIONS

BOSTON AND NEW YORK
HOUGHTON MIFFLIN COMPANY
The Riverside Press Cambridge

Published December 1916

The Riverside Press
CAMBRIDGE · MASSACHUSETTS
PRINTED IN THE U.S.A.

PREFACE

To boil medicine down to the essentials needed by the general public and yet to avoid making it tasteless is my attempt in this book. It is too long; but I could not make it shorter without also making it duller.

Not everything in it is "practical," for one of the public's needs, as I see them, is to get a glimpse of some amazingly interesting aspects of medicine which have little or no practical value. The pages on comparative anatomy, the tragic facts of anaphylaxis and some other passages were written out with this belief.

"A little knowledge is a dangerous thing." Yes; it certainly is. But since every body and soul in the civilized world has now been thoroughly exposed to this dangerous contagion, I know no way to reduce the risk of disaster except by injecting into all who will submit a larger dose of knowledge in the least irritating form procurable. Gradually I hope an immunity to its dangers may thus be produced.

Part of the book was given during 1915 and 1916 in the form of lectures to a group of social workers; their needs have guided my selection of subject matter because, as I see it, they best represent the gen-

eral public. For the same reason their questions and the answers given to them have been made part of the book.

The illustrations are rough and sketchy but, I hope, worth their space. I here thank Messrs. D. Appleton & Co. for the use of the cuts used in Figs. 1 and 2 and W. B. Saunders Co. for a diagram of the ear.

RICHARD C. CABOT

1 MARLBORO ST., BOSTON
November, 1916.

CONTENTS

CHAPTER I

ANATOMY AND PHYSIOLOGY

CHAPTER II

DISEASES OF THE RESPIRATORY SYSTEM

CHAPTER III

DISEASES OF THE HEART AND ARTERIES

CONTENTS

CHAPTER IV

DISEASES OF THE GASTRO-INTESTINAL TRACT

CHAPTER V

DIET — CONSTIPATION

CONTENTS

CHAPTER VI

DISEASES OF THE LIVER AND INTESTINE

CHAPTER VII

DISEASES OF THE KIDNEY AND BLADDER

CHAPTER VIII

DISEASES OF THE GENERATIVE ORGANS

CONTENTS

CHAPTER IX

DISEASES OF THE NERVOUS SYSTEM

CHAPTER X

DISEASES OF THE NERVOUS SYSTEM (*continued*)

CONTENTS

CHAPTER XI

DISEASES OF THE NERVOUS SYSTEM (*continued*)

CHAPTER XII

DIABETES, DISEASES OF THE BLOOD, DISEASES OF THE BONES AND JOINTS

CHAPTER XIII

DISEASES OF THE BONES AND JOINTS (*continued*) DISEASES OF THE MUSCLES

CHAPTER XIV

INFECTIOUS DISEASES

CHAPTER XV

INFECTIOUS DISEASES (*continued*)

CHAPTER XVI

POISONS

CONTENTS

CHAPTER XVII

INDUSTRIAL DISEASES—SKIN DISEASES

CHAPTER XVIII

DISEASES OF THE EYE AND EAR

CHAPTER XIX

EMERGENCIES — HOME MEDICINE — PERSONAL HYGIENE

CHAPTER XX

MISCELLANEOUS AILMENTS, TRIVIAL OR SEVERE

CONTENTS

LIST OF FIGURES

LIST OF FIGURES

A LAYMAN'S HANDBOOK OF MEDICINE

A LAYMAN'S HANDBOOK OF MEDICINE

CHAPTER I

ANATOMY AND PHYSIOLOGY

ANY one who studies the human body soon becomes aware of two opposite and extraordinary things: first, that it is full of beauties and extremely useful contrivances, and second, that it contains a number of blunders. Any one who is bound to think that it is the work *in toto* of an intelligent Creator here confronts a hopeless difficulty. But any one who goes to the other extreme and thinks that it is the product of chance evolution is in another hopeless difficulty, as I see it. Hence I cannot face the fact of the body's beauty and usefulness, and also the fact of its ugliness and mistakes, without saying something on the relation of the body to God.

The relation of our bodies to God is somewhat like the relation of our souls to God. We do not expect that our souls will be perfect. Our bodies are a part of nature and need not be assumed to be perfect. Presumably bodies and souls have a certain amount of freedom whereby they can go wrong. I see the body, like a great deal of the rest of nature, heroically trying to do right, often with extraordinary success, some-

times with pitiful failure; and I find this in no way irreconcilable with a belief in God. But I should find it impossible if I did not recognize that element of freedom to go wrong which I think is present in the whole of nature, and which I think makes nature sometimes beautiful, sometimes cruel, sometimes badly contrived, and sometimes marvellously ingenious.

Anatomy begins with the skeleton because it is the easiest part to keep and handle, but the first thing to know about the human skeleton is that it is really formed last. We have the idea of the dry bones becoming clothed with flesh; the opposite is the fact. The soft flesh gradually makes within itself a skeleton. The baby is born practically with no skeleton; some of the smaller animals never have much of any. In man the skeleton is gradually developed as it is needed.

There are two kinds of skeletons in the animal kingdom, those arranged on the outside and those fixed on the inside. We have both. The lobster has a skeleton on the outside and keeps his soft parts inside it. This type of skeleton restricts movement, but has great advantages from the point of view of protection. Our skeleton is worked out to combine the two advantages so far as possible. It is on the outside of the brain, like the lobster or tortoise skeleton, because our brain needs protection more than any other part of our body, yet does not need independent motion or flexibility. We have a skeleton of the inside type in parts of the

body where bone is useful for support and the attachment of muscles. Animals that do not need to stand upright, fish for example, need very much less skeleton; we need a great deal for purposes of support. Free-swimming animals do not need so much stiffening.

I think it is a little easier to begin with the extremities. The human arm is developed out of the fin of a fish. As we come up the animal scale through such tools as wings, paws, or legs, we have one bone of the original fin remaining next to the body; that joints on to two bones, which in turn joint on to a number of other small bones (the wrist and hand). Thus, from a fin you get an arm; next the body, one bone, then two bones, then a lot of little bones on the end. That explains that poor arrangement of things that we call the wrist. It seems a stupid arrangement, a mere makeshift, but perhaps it is the best that the body could do in making an arm out of a fin.

The same idea is carried out in the lower extremity: one hip bone, two lower-leg bones, a lot of little bones at the ankle, and then toes. It looks as if it would be much better to have one bone instead of all this mass of little bones in the wrist and the ankle. If we have to master the arrangement of those bones, we soon find out how arbitrary and awkward it is; but as a way of getting for ourselves an arm and hand when we had a fin to start with, it becomes on the whole very intelligent. Note, then, the similarities in the arm and leg, and that we had the same similarities in wing and claw

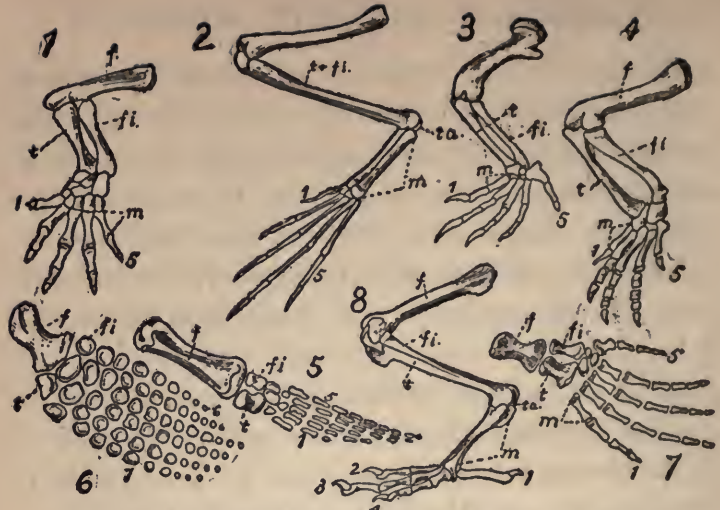


FIG. 1. Leg bones of various animals arranged to show the corresponding parts.
1. Salamander. 2. Frog. 3. Turtle. 4. Aëtosaurus. 5. Plesiosaurus. 6. Ichthyosaurus. 7. Mososaurus. 8. Duck. In each leg the letter *f* stands for *femur* or thigh bone, *t* for *tibia* or shin bone, *fi* for *fibula* the other bone of the lower leg. The toes are sometimes numbered.

FIG. 2. More leg bones arranged as in Fig. 1.
9. Ornithorhynchus. 10. Kangaroo. 11. Megatherium. 12. Armadillo. 13. Mole. 14. Sea lion. 15. Gorilla. 16. Man. Note how in the kangaroo and sea lion the thigh bone (*f*) is abbreviated in comparison with its size in man.

and finally feet: one bone nearest the body, then two, then many; finally, a fanlike extremity which can either be expanded into claws or fused together into a hoof, or left as fingers and toes.

The four extremities are fastened to the trunk by joints, ligaments, and muscles; the upper extremity extraordinarily loosely, the lower more tightly. The

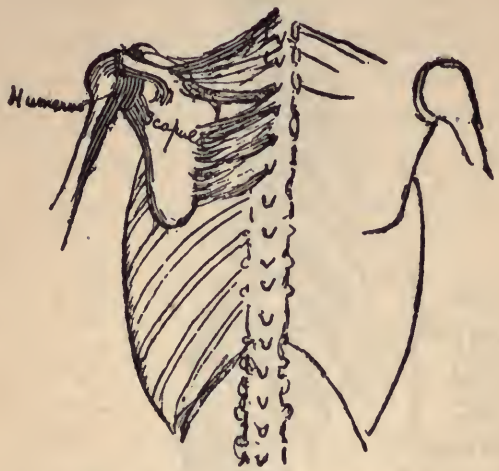


Fig 3. To show how the scapula is joined by muscles to the back bone and how the upper arm bone (humerus) fits onto the shoulder blade (scapula)

arm bone fits into a shallow cup in the shoulder blade (the scapula). The scapula itself is attached only by muscles to the collar bone and to the chest. The whole thing is loose and free. See Fig. 3. This arrange-

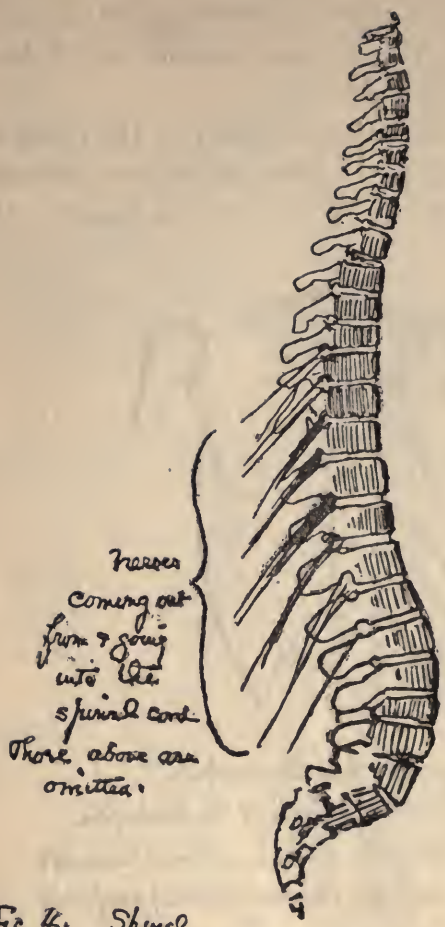


Fig 4. Spinal
Column; ribs removed & some other parts omitted
The exit of nerves from spinal cord is indicated

ment is of great value in giving extraordinarily free motion of the arm. We have n't anything like this motility in the leg; on the whole we do not need it. The leg is joined on much more firmly, with a ball-and-socket joint, giving greater firmness for supporting the body's weight, and much less freedom for other purposes.

The rest of the skeleton is essentially the backbone, skull, thorax, and pelvis. The backbone is made of a number of separate pieces, *vertebræ*, which come through the whole vertebrate kingdom from the fish up. We often find on the beach the vertebræ of fish which we can recognize at once as vertebræ. They are piled on top of each other like bricks, in a column, with cartilage binding each to each like mortar. The whole column is hollow, and down the centre of it goes a prolongation of the brain, which we call the *spinal cord*, through which travel all the influences of command which pass out of the brain and all the news messages which come into the brain. The branches of spinal cord get to the outer world through a series of side windows which perforate the vertebræ every inch or so. From these branches come pairs of nerves, right and left, all the way up and down from the level of the skull clear down to the pelvis. Those nerves branch and branch like trees and their tips go to every part of the body: to the face, the head, the arms, the chest, the abdomen, and the legs.

The rather bizarre arrangement of *ribs* — which

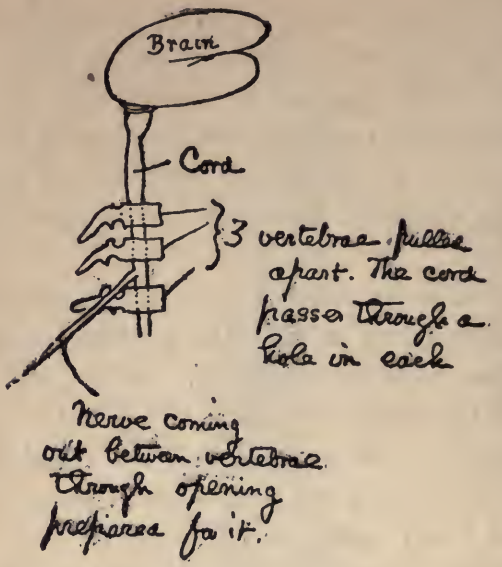


Fig. 3. Diagram to show relation of spinal cord & nerves to vertebral column

irreverent medical students often call the "bird-cage" — is a compromise between a defence and mobility. The heart and lungs are indispensable and precious organs which must be protected as far as possible, but still must have free motility for breathing. The ribs serve these two purposes admirably. In the back the ribs are hinged on the backbone (spinal column) so that when we breathe in they rise and go upwards, and as the air goes out they go down again and the chest becomes smaller.

The *scapula*, or shoulder blade, doubtless serves

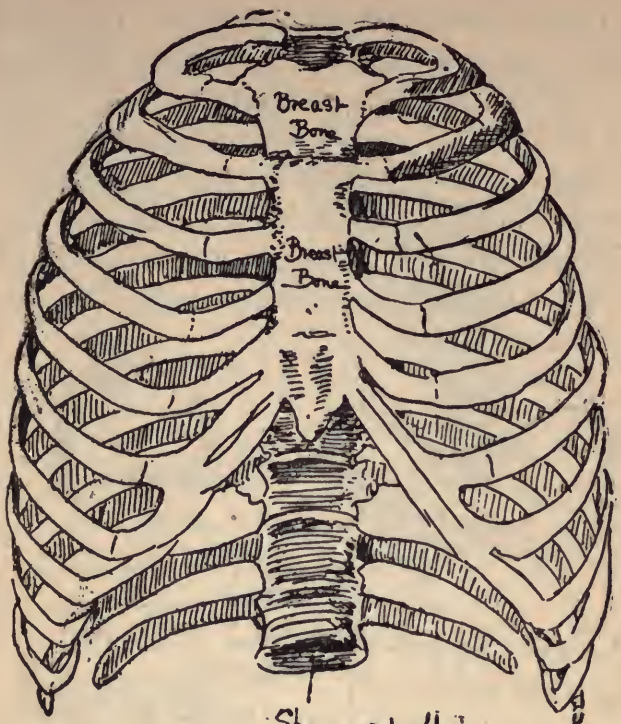


Fig 6. Breast Bone, Back Bone & ribs

some purpose of protection. Otherwise it is pretty hard to see why we have it. In birds there is very much less of it, and yet the muscles, which fasten on it, are carried just as well.

The *pelvic bones* are thick and heavy for three purposes: first, to protect the vulnerable and precious

genital organs, and the developing baby in the female; secondly, because the back and leg muscles, the largest and strongest muscles in the body, pull upon these bones; and thirdly, because through them the whole body weight is transmitted to the legs. The outlet of the pelvis, through which the baby has to pass when it is born, is between the sacrum (what corresponds to the root of the tail of our arboreal ancestors) and the

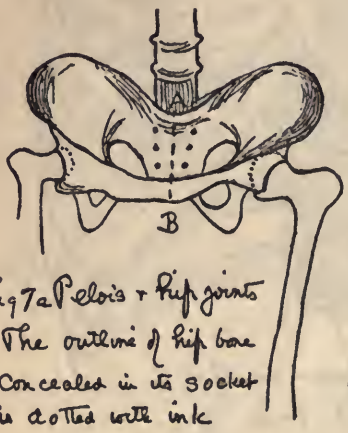


Fig 7a Pelvis + Hip joints
The outline of hip bone concealed in its socket is dotted with ink

Another dotted line (A to B) stretches from the pubic bone in front to the sacrum behind + shows where the fetal head passes the narrowest strait at the moment of birth. The same line is also marked in Fig 7b

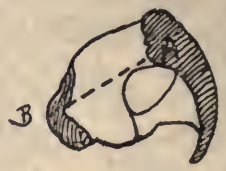


Fig 7b Cross section through sacrum + pubes along the line dotted in Fig 7a.
The line A B. reveals the same course as in Fig 7a

pubic bone in front. The size and shape of that opening, as it is made right or wrong, roomy or narrow, determine the ease or difficulty of childbirth. One of the duties of the obstetrician is to

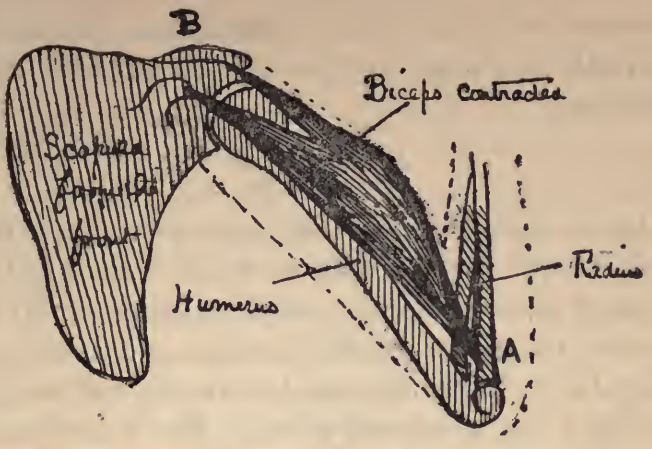
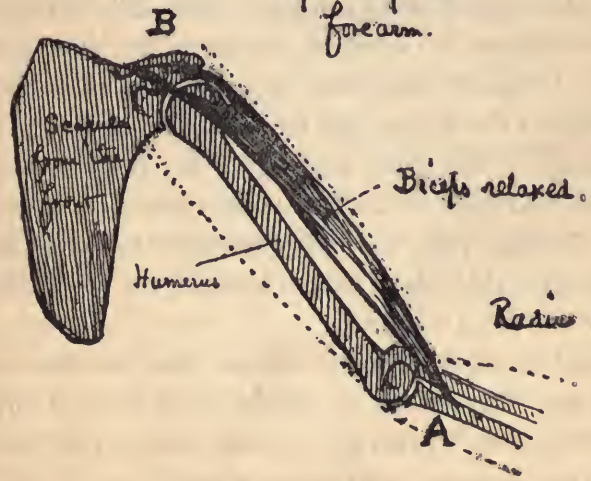


Fig 8. To show how biceps is fastened to the bones at each end, & how by contracting it pulls up the forearm.



measure those bones before childbirth and know exactly whether there is proper room for a child to pass between.

The Muscles

Bones, aside from stiffening and support, serve the purpose of giving points of attachment to the muscles. When I wish to draw my arm up, I am able to do so because the muscle which is attached at A is also attached at B. When that muscle contracts, it draws the points A and B nearer together — the characteristic work of every muscle being to bring its two ends nearer together. Because a muscle can do that, an arm can move. Because another muscle which is hitched on the back of the upper arm and on the back of the forearm, because that muscle also contracts and pulls up the tip of the elbow, we are able to push the arm out straight. All movements that we make — such as the movements of the tongue and face, the fine movements of the hand, of the trunk and legs — are possible because the two ends of some muscle come nearer together. Because these two ends are fixed to bones at the extremity, the muscle is able to move the limb, the trunk, or the head.

We need to know very little about the muscles so far as I see. Physicians also know very little about them. They occur in two great groups, a fact that one can readily remember: a group that bend up (*flexors*), and a set that stretch out (*extensors*). In every part

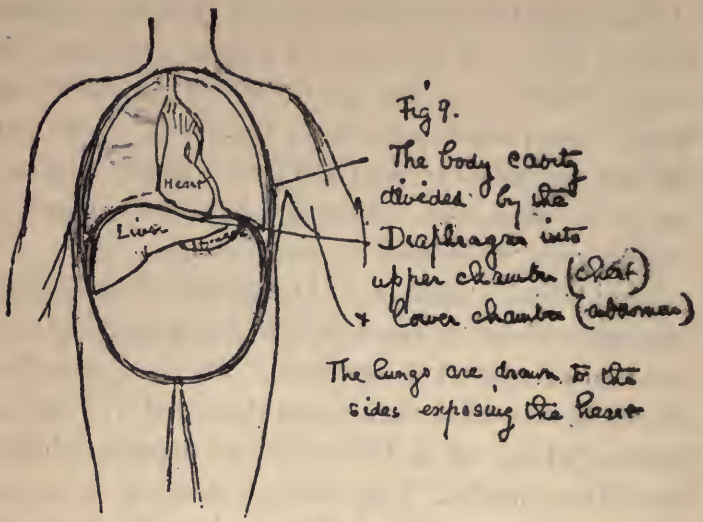
of the body there are these pairs of muscles opposite to each other, all of them, of course, controlled by nerves, which go up through the spinal column to the brain. Every motion starts in the brain, comes out through the spinal column and nerves to the muscles, and so to the bones. The end result of a command coming from our brain is to move a bone.[1]

There is also a small group of muscles called *involuntary*, not subject to the will, muscles which contract without our control or intention. The best examples are the muscles of the heart and the muscles of the intestine. Those are a little different microscopically from other muscles. They are not attached to bones, and they get their pull in both cases from the fact that they are circular. The heart muscles run around the heart, the intestine muscles around the intestine, and when they shorten they shorten all around the circle, as a rubber band shortens when it draws in.

Contents of the Chest and Abdomen

The cavity of the human body, when we leave out of account the extremities and the head, is an oval divided into an upper chamber and a lower chamber by the diaphragm, which is the floor of the chest cavity and the ceiling of the abdominal cavity. The diaphragm is an arched, smooth, flat muscle hardly any thicker than cardboard in parts. Like any other

[1] Among the voluntary muscles there are but a few unimportant exceptions to this rule. But it does not hold for the group next described.



muscle, it can contract. It is hitched to the ribs on both sides; to the backbone behind and to the breast-bone in front. When it contracts, of course, it must draw its ends nearer together. To do that it must "descend" as we say — that is, flatten out its arch. When it flattens out, its centre goes down, like the piston of a pump, and thus sucks air into the chest through the mouth. That is the great action of breathing, far more important than anything the ribs do. Even when the rib joints are ossified and the rib rigidly fixed to the spine, the person breathes fairly well. But if the diaphragm is paralyzed, the person dies. It is, therefore, the most important muscle that we have. It divides the body, as above said, into two great cavities, the chest above and the abdomen below.

The Heart and Lungs

The lungs fill nearly all the upper body chamber except what is filled by the heart. There are no important organs in this cavity except the heart and lungs.

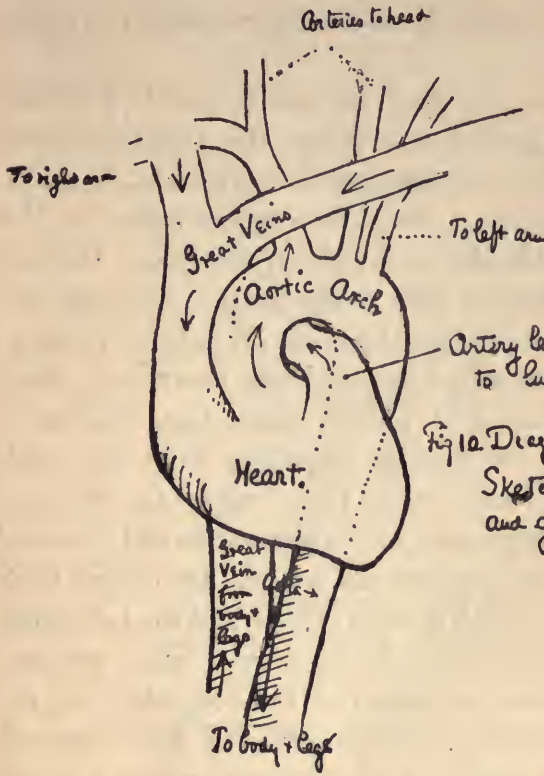


Fig 10. Diagrammatic Sketch of the heart and great vessels.

All the rest of the bothersome organs are below the diaphragm. From the heart, as Figure 10 shows, go two great branches, the beginning of the arterial tree,

nearest the heart. From the main *arterial* trunks go the larger branches, and then smaller and smaller twigs, until we get down to the *capillaries*, of microscopic size. They honeycomb the tissues themselves, and regather on the other side to form another set of tubes, the *veins;* these gather into large tubes, one leading back to the heart from above and one coming from below.

It is not worth while to go into the details of circulation. In a general way it has this plan: the heart pumps in two directions at once. When it contracts, it pushes the blood out as we squeeze water out of a sponge; the blood goes out in two directions. Through one set of tubes it goes to the lungs. (The lungs are especially favored; they have one set of tubes to themselves.) All the rest of the body—the heart, brain, liver, kidneys, stomach, intestine, arms, legs, genitals—has another set of tubes branching from one trunk (the *aorta*). From both of these regions the blood returns and starts again. On its way out we call it *arterial* blood, and the tubes we call *arteries*. On its way back to the heart we call it *venous* blood, and the tubes that carry it we call *veins*. In the nerves, brain, muscles, and every part and organ of the body there are extraordinarily fine tubes, the capillaries, finer than any hair, in close contact with every part of every organ. They receive from the arteries nourishment for every tissue. Downstream from the capillaries the veins carry back the venous blood containing the body waste.

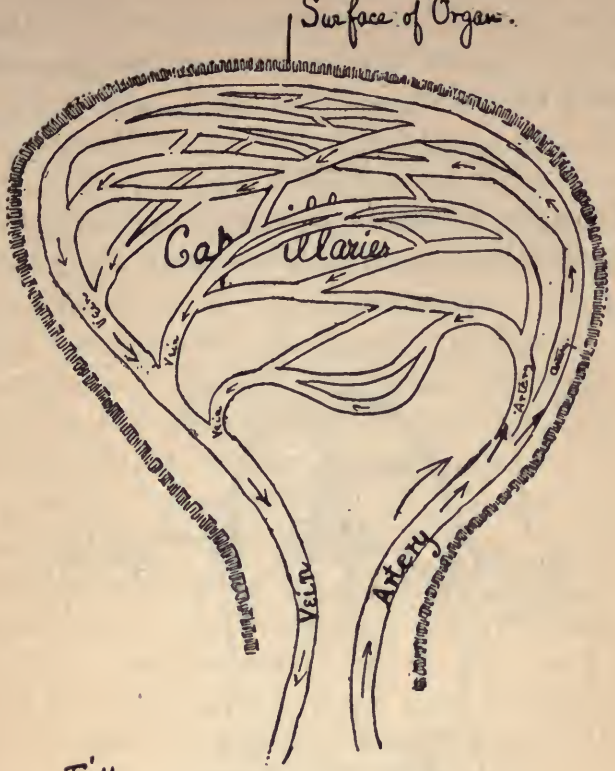


Fig 11

Diagrammatic cross-section of an imaginary organ somewhat like the spleen. The artery breaks up into smaller arterial twigs. These divide into capillaries which empty into the smaller veins. The small veins join to make a single large vein. This leaves the organ close to the artery

The great function of circulation is to warm and nourish the body. It carries the air and food to the organs and it carries back, away from the organs, some of their waste products.

Respiration

The lungs, the position of which we see in Figure 12, fill up all the space in the chest except that which is

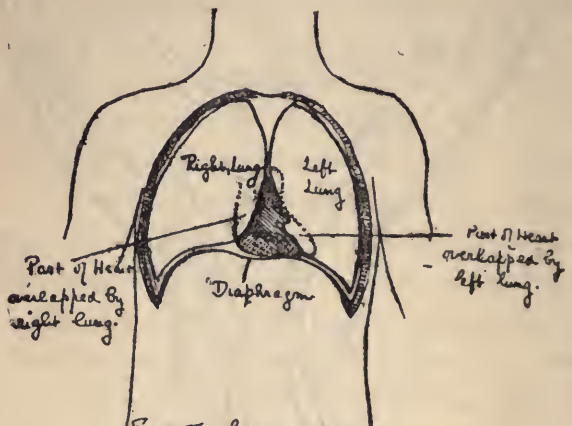


Fig 12. The front wall of the Chest is removed to show the position of the Heart and Lungs.

taken by the heart. They fill all the chinks around the heart, which is set on the diaphragm a little to the left.

To the lungs the blood is sent by the heart after returning from all the rest of the body, bearing the waste products. In the lungs that blood meets with air, the air which we draw into our lungs with each breath.

If we ask just how this meeting occurs, it is hard to answer. It is a very mysterious process, for the oxygen of the air goes into the blood right through the walls of the blood vessels. But parts of the air (what the body does not need) are left behind. It is not at all a process of filtration; the air is not simply sucked in, but a process of intelligent selection goes on. The air contains some things which the body needs and some things that it does not need; in the blood vessels of the lungs it meets with the blood which contains some things it does not need. Then an exchange occurs. The blood takes about twenty-three per cent of the oxygen out of the air and gives back in exchange another gas — carbon dioxide, a waste product. That is the essential process of respiration.

One of the things I think that every person should know about respiration and the lungs, is that out of all the oxygen which we draw into our lungs, *we take but a small part, about twenty-three per cent; we reject all the rest.* In other words, we do not make use of all the oxygen in the air which we breathe in, because the body does not need it. The practical point is this: people are always talking about getting more oxygen into their blood. If we force more oxygen into our lungs, we do just the same thing as if we forced upon a man, who had already eaten part of a huge dinner, six more dinners. The body has already taken all it can take out of the tremendous superfluity of oxygen which comes into the lungs. It cannot take more.

Many partially educated persons think that if we take deep breaths, force more air into our lungs, we shall get more oxygen into our tissues. But we cannot. There is no sense in deep breathing for the purpose of getting more oxygen into the lungs. It has an effect upon the brain, but it has no effect upon the lungs; it does not force oxygen into the system. The effect upon the brain is very interesting: it puts the soft pedal on our thoughts. It fogs our brains which is sometimes a good thing to do. For that reason, among Oriental religious sects and other people who try to follow their lines of thought, the practice of deep breathing persists, and may be useful because of its calming effect upon the brain. Again, deep breathing has an effect upon the bowels; I think it is of use in some cases of constipation, because deep breathing, forcing the diaphragm down, stirs up the bowels when they are logy, and helps to push their contents along.

Questions and Answers

Q. In a room with the air in motion, is there danger from a draught?

A. I imagine that people are individual in that matter. From my own observation I should say that most of us were far better for living in a draught all our lives, but that some people are harmed by it.

Q. If the air does not have to be cold, simply has to be pure and to be in motion, what is the advantage of an outdoor school?

A. Pure air means air that is not too hot and that is in motion. These conditions are easiest found outdoors.

Purity has nothing to do with CO_2 or O_2. Stale air may be made perfectly fresh, not by changing the oxygen, but simply by cooling and putting the air in motion. Indoors air gets hot and stagnant. Outdoors it is cooler and moves more. I am leaving out here the question of odors, which of course are easier lost outdoors than in.

Q. Why does blood go back to the heart?

A. It is pushed on from behind and sucked from in front. The system of tubes is closed. There is nowhere else it can go. Moreover, in the veins there are valves which open toward the heart and close the other way, so that any blood that gets going is held by them. Second, the veins go in among the muscles. Every time the muscles contract they squeeze the veins. The veins are so thin-walled that they contract, are thus emptied, and because of the valves they must empty toward the heart.

Q. How does it get from the arteries to the veins?

A. Through the capillaries. The capillaries are a closed system of tubes, very small, continuous from the arteries on one side to the veins on the other.

Q. I did n't understand what you said about deep breathing.

A. I said that taking deep breaths, so as to force air into the lungs, did not force any more oxygen into the blood, and did not therefore accomplish what it is supposed to accomplish. In the lungs our blood selects out of the total bulk of oxygen that comes there a small proportion, about twenty-three per cent which we use; the rest we reject. If we face a draught or try to get any more air into the lungs, we do not get any more oxygen. Fresh air, aside from its freedom from smells, means essentially two things: air that is not too hot and air that is in motion. If we get into a room where the air is stale and close, we can make that air fresh by cooling it and setting it in motion. We do not need any more oxygen nor any less carbon dioxide.

The reason that motion is necessary to freshen air is this:

The body warms a little coating of air around itself, and that envelope of air is not easily broken up unless the air around us is in motion. Without motion breaking up our warm air envelopes, the cool air does not really get to us; it is held off by the envelope of heat around us. The value of deep breathing is for the mind and for the bowels. Do not discourage anybody from it, but only from thinking that it will do any good to their lungs.

Q. Would it not increase the circulation of air in the upper lobes of the lungs?

A. Possibly; but no one knows whether there is any value in that.

Q. Would it help to develop the muscles of the chest?

A. Yes, but that is not important.

Q. Is the fellow with a sunken chest just as well off as the one who stands straight?

A. The fellow with a sunken chest is not as good an asset. It is not so much a hygienic question as an æsthetic and financial question. The man who stands straight presents a more beautiful picture to the eye and can get a better job.

Q. Does not a sunken chest cramp the lungs and so injure them?

A. I know no evidence of that. Moreover, large lungs are not an advantage so far as I know. I wholly believe in standing up straight, but not for hygienic reasons. I believe in it for moral, financial, and æsthetic reasons.

The Breathing Tubes

The pharynx is the back of the throat. There we find two openings going down, one to the stomach, the other to the lungs. When we say that a child swallows something "the wrong way," we mean that food which was meant to go to the stomach has started to go to the

lungs by mistake, although it almost never gets there. The pharynx is the common beginning of these two tubes, one that goes to the lungs (the windpipe or trachea), and one that goes to the stomach (the gullet). Upon this last the term *esophagus* has such a firm hold that we must learn it, though the simple word *gullet* is more familiar.

As we go down the windpipe leading to the lungs, we come across the *larynx*. Essentially it is like a stringed instrument. Any stringed instrument makes music because a cord is stretched tight and vibrates. Two cords, the vocal cords, are stretched tight and vibrate when the breath from the lungs goes over them. These cords make what is essentially a little musical instrument set in the tube leading to the lungs. The air coming out of the lungs causes the vibrations that make our voices, whether for speech or song.

Just below the larynx is the common trunk tube which then divides into right and left branches. The trunk tube is the *trachea*, and the two main branches are the largest-size *bronchi*. These again divide and divide repeatedly into smaller tubes (the *bronchioles*), each of which at last reaches a blind pouch lined with blood vessels where the air and the blood meet and barter their contents in the extraordinary way that I have suggested, the blood vessels winding in and out of the walls of the end-pouches so as to get at the air. These pouches, plus the tubes leading to them, plus the blood vessels, plus the necessary framework to hold

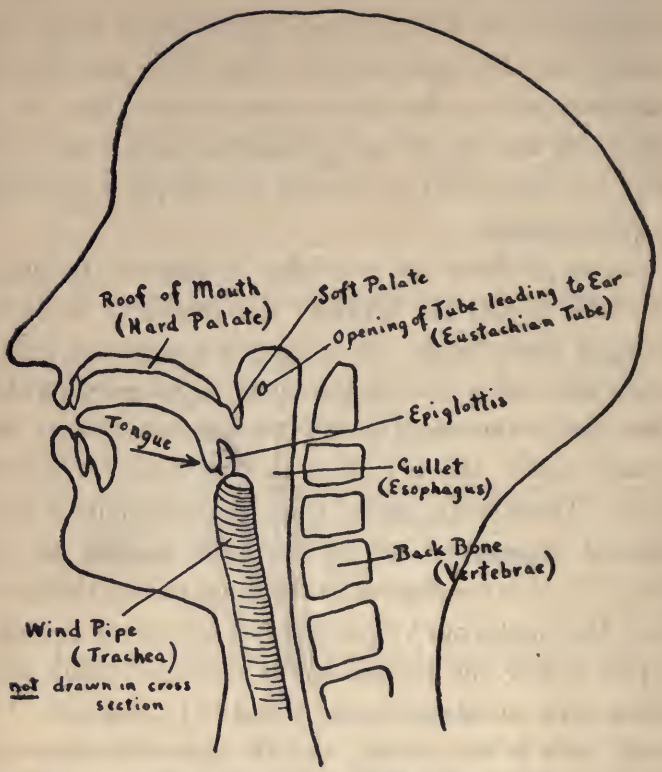


FIG. 13. Diagrammatic Sketch of the Openings of Windpipe and Gullet.-Larynx left out. When we swallow, the tongue slides horizontally backwards. [see →] and shuts the Epiglottis over the mouth of the windpipe so as to keep out food.

Except the Windpipe the whole is drawn in cross section.

them all together, make up the whole lung. Corresponding to these parts we use many different terms: — pharynx, larynx, trachea, bronchi, bronchioles,

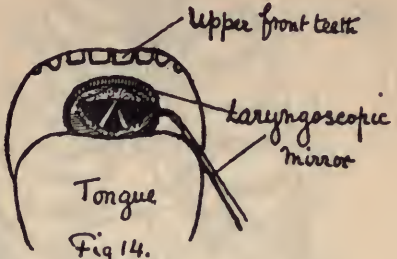


Fig 14.
Image of the larynx as seen in mirror held above it. The two white bands in the centre are the vocal cords.

alveoli (or pouches), which simply name the successive parts as we go down from the mouth.

The Tonsils

Just above the pharynx, at the root of the tongue, are the tonsils. The tonsils are organs the use of which we do not know. People in whom they have been removed do just as well, usually better. Like the spleen, they represent mysteries. But they are a particular bother to us because so many of the dangerous infections spreading to the heart and kidneys seem to start in them. I do not think we know whether those tonsil infections go in or come out. We generally assume that they go in to the tonsil with milk or whatever is

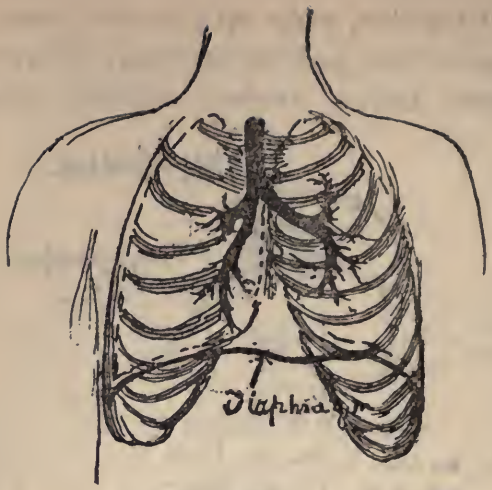


Fig 15.
Trachea, bronchi and their branches in the lungs.

Fig. 16.

swallowed. We do know that trouble in the tonsils often appears *just before* some more serious disease of the heart, kidney or joints. If disease starts in the

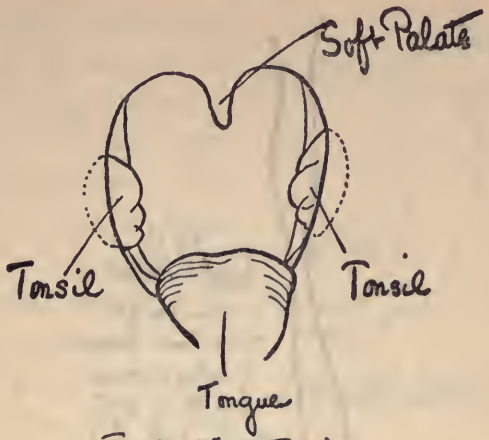


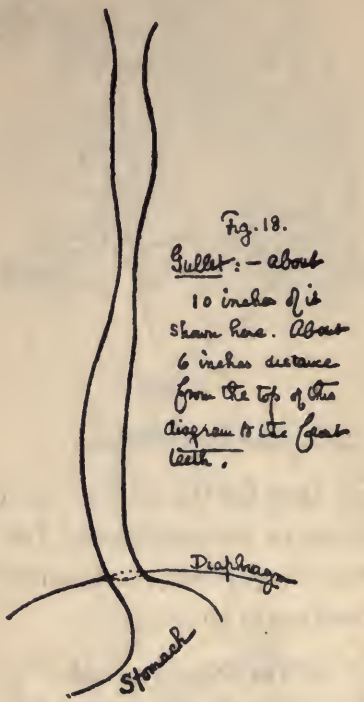
Fig 17. The Tonsils

tonsils, we have hope for the future. For we never shall cure heart disease or kidney disease, but we may prevent them if we can prevent the tonsillar disease from which they often seem to start.

The Digestive Tract

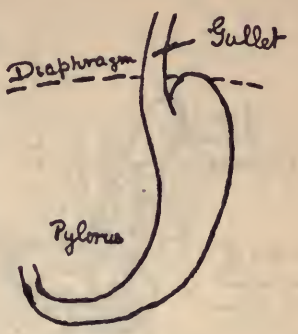
The digestive tract begins in the mouth, goes on with the gullet, which pierces the diaphragm, far back against the backbone. As soon as it gets below the diaphragm, it becomes the beginning of the stomach. The stomach is simply an enlargement of the digestive tube (gullet above, intestine below) which leads continuously through the body, from the mouth to the anus, without any break; so that a substance may go

into that tube and pass through without being *in* the body in any other sense. It may be kept out of all the rest of the body, enclosed within this closed



system of tubes. This is important. Many substances, which if introduced into the blood or muscles would kill, are perfectly harmless within this inner protected tube, the digestive tube. Poison meets with the acids and other hostile substances there. Some, snake poison, for example, is harmless in the stomach, fatal in the blood.

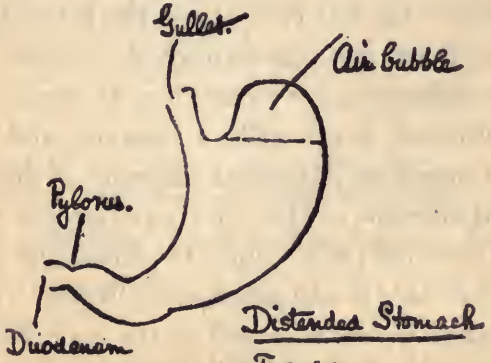
Just below the stomach we have this double turn called the *duodenum*, which is simply the first part of the intestine. Below this we have about twenty-two feet of tubing (intestine) which fills up most of the space, from the ceiling or diaphragm above to the pelvic floor below. That twenty-two feet of intestine has no fixed dwelling-place; it shifts and squirms and fills in chinks, taking now this position and now that. It does not stay in one place like the heart and lungs.



Contracted Empty Stomach.

Fig 19

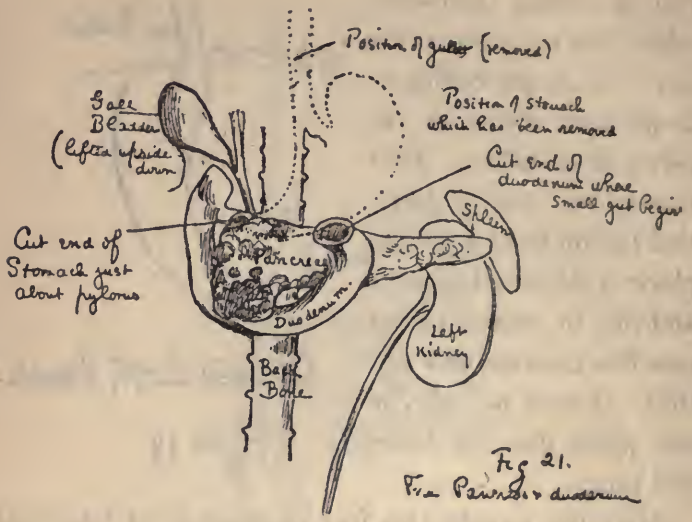
After the twenty-two feet of small-sized intestinal tube, we come to a portion about three feet long called



Distended Stomach

Fig 20.

the *large intestine*, about twice the diameter of the small intestine, and with a fairly fixed position. The large intestine begins at the place which most people are



now familiar with, as the home of the appendix, then travels up to the left ribs, across the pit of the stomach, then down and out through the pelvis. The use of those different parts I have now to recall.

The stomach is primarily a reservoir and a mixer. It is not nearly as important an organ of digestion as the small intestine is. Its chief importance is mechanical, not chemical; not mainly to change the food, but to mix it, to hold it and pay it out a little at a time into the intestine in the way and at the rate that the intestine can take it best. While holding food it changes and mixes it, reducing the coarser parts to soft mate-

rial. Some chemical change also goes on there, but that chemical change is not essential, as shown by the fact that if the whole stomach be taken out and the lower

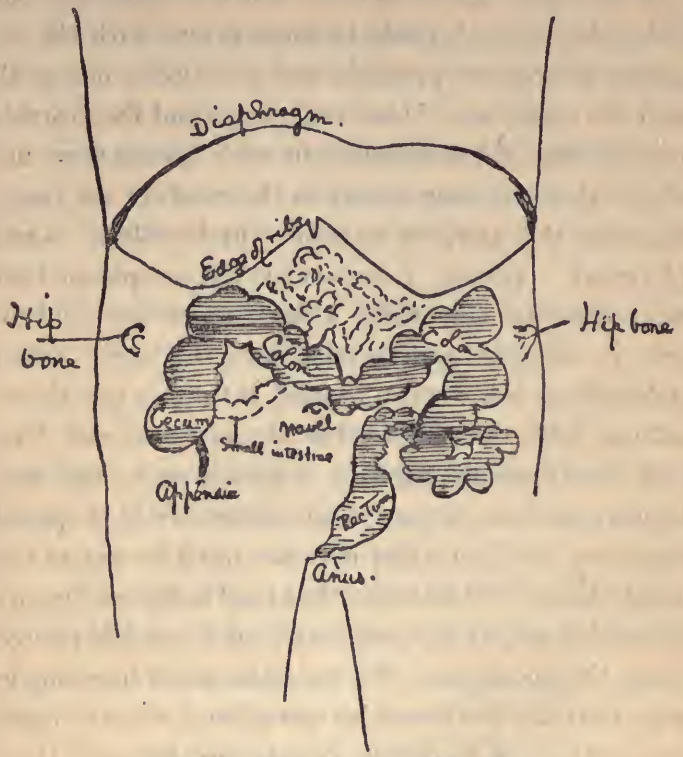


Fig 22 The course of the Large intestine. Only a little of the small intestine is drawn in

end of the gullet hitched to the upper end of the intestine, all necessary digestion of the food can be per-

formed in the gut. In fact all the digestive processes are normally performed in the gut, even if the stomach does them first.

Of the three classes of foods which we take into our body, the stomach deals to some extent with the digestion of one, the proteids, and practically not at all with the other two. Meat, milk, eggs, and the proteids of vegetables, the stomach deals with, breaks them up, adapts them to some extent to the needs of the body. It has for that purpose an acid — hydrochloric — and a ferment — pepsin. A ferment is too complicated for me to describe, something which acts on food and digests it, without itself getting into the food. When hydrochloric acid acts on proteid, it forms a new chemical unit with the proteid; the ferment does not. The food thus partially digested is passed on to the duodenum and there meets the bile sent down by a special pipe from the liver. But it is not until we get to the twenty-two feet of intestine that food is digested in any essential sense, by the pancreatic juice and bile poured out in the duodenum. We have the small intestine in order that the food may be spread out over the enormous surface of the whole twenty-two feet and there digested before it is gradually absorbed into the blood.

Before food is absorbed it is acted on in the small intestine by the juice of the *pancreas*. The pancreas is by far the most important organ of digestion, and can do all the work without any help from the stomach itself. The pancreas lies close behind the stomach, a

soft grey mass about the size and shape of a pistol shooting to the left. A tube leads from the pancreas into the duodenum, and through that tube goes the powerful digestive juice without which the body cannot live. If that duct gets stopped up or cut, the person soon dies. Absolutely essential is that pancreatic juice.

1. The stomach is for storing and mixing.
2. The intestine is for digestion and absorption.
3. The pancreas supplies the essential chemical which changes the food into something the body can use.
4. The stomach juices, the bile, and the juice of the intestine itself, are minor factors in digestion.

At the beginning of the *large intestine* the food residue slows up and begins to accumulate as the watery part of it is absorbed, so that instead of being of the consistency of thick soup, as it is all through the small intestine, it becomes more and more dry and finally of the consistency of the *feces* discharged in the form of a "movement of the bowels." Feces represent the waste product of the food, what we do not need and cannot use. They also represent a good deal of substance secreted by the bowel itself. A person taking no food at all will have movements of the bowels, consisting mostly of a substance secreted by the intestine out of its own wall.

At the very beginning of the large intestine, on the right side near the hip bone, is the part that every-

body knows about, *the appendix*, one of the disastrous mistakes of human anatomy, which was of value to some of the lower animals, but to us has no value and great dangers. The appendix is a pouch about as big as the little finger of a glove; it hangs down like a tail free from the intestine. It communicates directly with the intestine, but is very prone to get stopped up, to get inflamed, and when inflamed to produce a dangerous peritonitis. *Peritonitis* is the inflammation of the lining membrane of the abdomen, the walls which shut in the intestine as I have described it.

The Liver

The *liver* is the largest organ of the body, and with one or two exceptions, the least understood. We really do not know why we have such an amount of liver. It fits snugly under the right dome of the diaphragm and goes clear across the body from side to side. We know from our experience at the dinner table what its consistency is. It was once taught in physiology that the purpose of the liver is to secrete bile, and that it certainly does, but that is a relatively slight and unimportant function. A more important thing that the liver does, in all probability, is to stop poisons, formed in the intestine during the digestion of food, from getting into the general circulation. The blood goes from the intestine through the liver before it joins the general blood stream on its way back to the heart. It is hard to realize that strong poisons are made three

times a day in the process of breaking up our food. When our food is in the intermediate stages, between its unchanged state and its final condition as part of our bodies, it is sometimes very poisonous. We believe that those poisons are neutralized or put out of action in the liver.

The liver is sometimes a storehouse of fat. There are certain reservoirs in the body where fat is stored. One of them is the abdominal wall, where people try to conceal it by wearing tight corsets. Another one is round the kidney, where great masses of fat collect. And another one is in the liver itself. More important is glycogen, one of the intermediate products of starch and sugar digestion, which is accumulated and stored in the liver. When a man is starving to death he lives for a considerable time on his own liver, his storehouse of fat and sugar.

The liver, then, as a detoxicator (unpoisoner) and as a storehouse of sugar and fat is an important organ. Its function as a secreter of bile is much less important. We can remove a considerable portion of the liver without a person suffering. When we get down to about two fifths and have removed three fifths he begins to feel it; but we have apparently a great deal more liver than we need for the preservation of life.

The left end of the liver touches the *spleen* at the bottom of the ribs, above the left hip. The use of the spleen we do not know: take it out and the human being gets on just as well. It certainly is not important

to life. It serves certain purposes, such as that of a graveyard for superannuated red corpuscles. That is one of the places where red corpuscles go when they die. But when you remove that graveyard the body seems to get along just as well. We do often remove it nowadays, and no harm results. But we could not remove the kidneys, the liver, pancreas, or any other organ named thus far or the patient would die.

The Urinary Organs

Half of each *kidney* is above the lowest rib in the back and half is below. They are bean-shaped and stand perpendicularly with the twelfth rib going nearly across the middle. They are close below the diaphragm and just outside the spinal column. One of the most interesting facts about the kidneys is the extraordinary mass of blood that goes through them. All the blood in the body goes through the kidneys within a few minutes. The size of the artery going to the kidney, compared to the size of the kidney itself, is enormous, and the importance of that is obvious when we see that the kidney has to take out of the blood most of the waste substances accumulated there. The blood circulates through the kidney, and by some mysterious process the kidney selects what ought to come out of the blood and takes it out; the blood then flows on and back, back toward the heart through the kidney vein. Those substances which the kidney takes out of the blood constitute *the urine*. Running down

and in from the parts near the surface of the kidney where subtraction is made, the urine accumulates in little tubes which radiate toward the inner curved centre of the kidney, what is called the *pelvis of the kidney*, and there is gathered up into one main tube, the *ureter*. There is a ureter on each side, a tube as big as

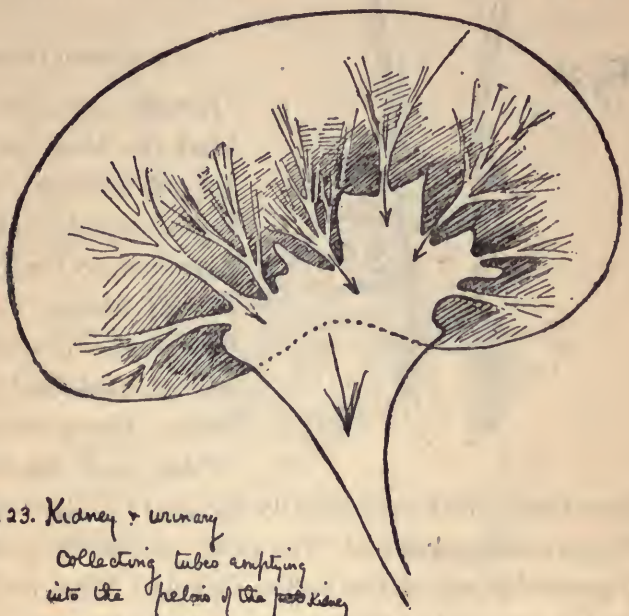


Fig. 23. Kidney & urinary
Collecting tubes emptying
into the pelvis of the kidney
& thence into the ureter.

the little finger, or a little smaller, which runs from the kidney round to the front and down into the bladder.

The *bladder* fits in behind the pubic bone. Low down and at the back of the bladder enter the two ureters coming down, one from each kidney. This bladder

serves as a reservoir for urine until it is ready to be discharged. The *ureter* is the tube leading from the kidney to the bladder. The *urethra* is the shorter tube leading from the bladder to the world outside the body.

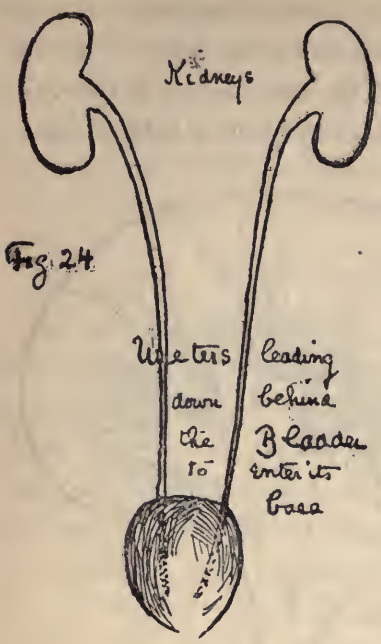


Fig. 24

The Genital Organs

Female Genitals. Behind the front part of the pelvic cradle, which comes round from the backbone to the front, is the *uterus*, a hollow muscle, pear-sized, pear-shaped, and open below. From each side of it goes off the Fallopian tube, which is ordinarily spoken of as "*the* tube." When doctors speak of "the tube" and nothing more, it generally means the Fallopian tube. When we hear that a woman has "the tubes and ovaries removed," it means the Fallopian tubes. The tube ends in a group of delicate, threadlike extremities that do not directly enter the ovary, which is suspended in the pelvis by another set of ligaments, close to the end of the tube. One of the extraordinary things about this arrangement is that there is no direct connection

between the ovary and the tube. The importance of that I will speak of a little later.

The uterus projects into the *vagina*, which is the tube leading to the external world. The uterus, tubes, ovaries, and vagina make up the essentials of the fe-

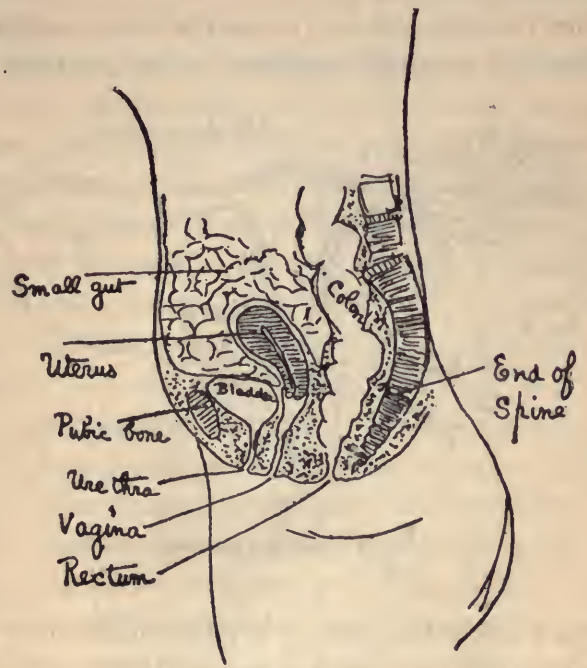


Fig. 25. Female genitals in cross section

male genital system. When the spermatozoon (the male seed) enters the vagina, it travels up the uterus and along the Fallopian tube. One would naturally

think that the female seed coming from the ovary would also have an opportunity to get *directly* into the Fallopian tube and so into the uterus, but it does not. Usually it gets across the space between the ovary and the tasselled end of the tube. But it may fall loose in the abdominal cavity.

When the spermatozoon meets the ovum, which has somehow got into the Fallopian tube, the two unite and

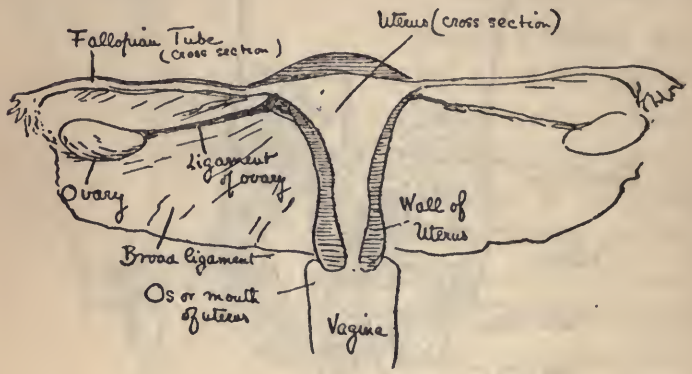


Fig 26. Female genitals

form one cell in this tube. They then make their way down the tube to the uterus and are implanted in the wall of the uterus, taking root there as a tree takes root in soil. *That is normal pregnancy.* After that the *fertilized ovum* — that is the egg, the female element joined with the male element — increases in size, because its cells divide and divide to form new cells, and gradually forms the embryo of the human being. As

that enlarges, the uterus enlarges to hold it. This is again one of the most mysterious processes — how the uterus knows enough to change from this small hollow muscle into the huge sac big enough to hold the child before birth. It undergoes all these changes in response to the need for them, and that is all we can say about it.

I have described normal pregnancy. Sometimes the ovum, after joining the spermatozoon, takes root in the tube. That is *tubal pregnancy* which ends by rupture of the tube, often with serious hemorrhage.

I have given so far no account of the relation of the uterus to the bladder, and that is much better brought out by a side view (Fig. 25). In front is the pubic bone, the front of the pelvic cradle, and just back of it is the bladder. The uterus is right behind that, an inch or two back from the pubic bone, and its position varies in different people and in the same person at different times. There is no one right position of the uterus. We used to teach that it ought to be slung forward and upright, and that if it was not in that position it was not right. But in fact it may tip forward, it may be straight up and down, or it may be turned clear back, and yet be perfectly normal. Disease results only when the uterus gets tied down as a result of inflammation and cannot move. Scars which form around the uterus fix the organ in a single position and give rise to pain, constipation, and disturbance of menstruation. If there are no scars and the uterus can move freely,

its position is not important. We are constantly hearing of women who have retroversions of the uterus or some other supposed malposition. But the best knowledge of to-day recognizes no single right position of the uterus. In the majority of people the uterus lies tipped slightly forward over the bladder.

The bladder has its own tube to the outer world, the urethra, which is just above the vagina, which itself is just above the anus, the opening of the digestive tube. It is because of this close position to the uterus that enlargements of the uterus often trouble the bladder, and make the urine pass frequently and with difficulty.

Just behind the uterus itself comes the *rectum*, the lowest piece of the large intestine, which empties at the anus, just below the vagina. In the passage of the child out of the genital canal, the vaginal canal enlarges extraordinarily to let the head of the child through, but in spite of that enlargement there is apt to be some *laceration* both of the neck of the womb and of the external outlet, and we often hear that such and such a woman must have a "cervix-and-perineum" operation. The *cervix* is the outlet at the lower end of the womb, and the *perineum* is at the lower and posterior edge of the vaginal tube. One of these is very often torn and needs repair. That repair is always a minor matter, is never essential to life, and seldom to health.

Male Genitals. In the *testicle*, the spermatozoa

(the male seed) are formed in millions. From there they go up through the *spermatic cord*, which passes through the groin, then doubles back upon itself behind the bladder and goes to the region of the *prostate gland*, which is behind the pubic bone and surrounding the first part of the male *urethra*. This tube, which leads to the external world, passes through the prostate gland which surrounds it as a lemon might surround a tube pushed through it. The male seed passes out to the external world from the same tube as the urine.

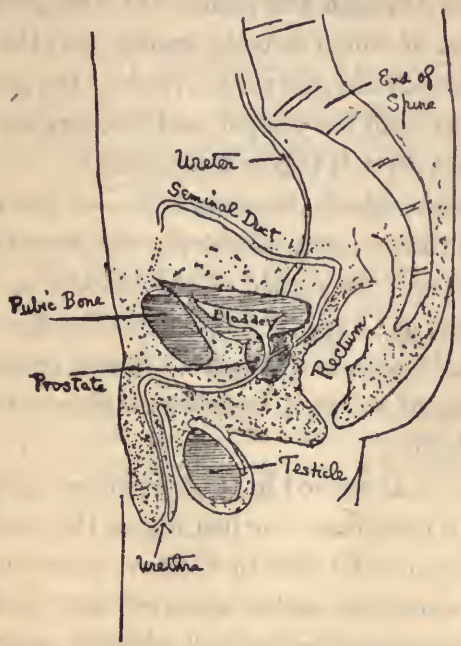


Fig 27 Cross section of male genitals

One of the important points in relation to the spermatic cord is that, as it leaves the testicle, it passes very close beneath the skin, so that by a very slight operation it can be cut and the individual thus rendered sterile. The operation has been done a great many times, whether justifiably or not, in the case of criminals. It is only a slight operation, done in a few minutes under local anæsthesia.

We have then three separate organs: (*a*) The bladder with the ureters coming from above, and the urethra emptying below through the penis. (*b*) The prostate gland — the use of which nobody knows, and the disadvantages of which are enormous. And (*c*) the genital tubes coming up from the testicle and discharging into the urethra, just after it leaves the bladder.

As I have said, nobody knows the use of the prostate gland. In the majority of elderly men it enlarges and often obstructs the orifice of the bladder so that the urine cannot get out. The bladder then does not empty itself and becomes distended. Hence come the urinary troubles of old men, from which women fortunately are exempt.

The spermatozoa, formed in the testicle in millions, accumulate in a little reservoir just above the prostate gland, and from time to time in healthy, chaste males this reservoir overflows and is emptied out in sleep, the so-called "nocturnal emission," which is perfectly normal, but often leads young men to suppose that they are diseased and to get into a very miserable

brooding, melancholic state. This possibility is seized upon by quacks who tell them that emissions mean disease and that they can cure it. Sometimes much money is thus wasted and much unhappiness results.

When the prostate gland obstructs urinary outflow, it can be removed, wholly or in part, and this is a very common operation, though it has some dangers because of the weakened condition in which the man often is. However, it is a very important operation, done innumerable times in every great hospital. The relief from a skilful operation is very great.

Questions and Answers

Q. Are the uterus, etc., contained in a sac?

A. They are held up by bands of fibrous connective tissue, but not joined together. It is one of the vast mysteries that they are not joined together, but separate so that the ovum can get lost. They are not joined to any other organ.

Q. What happens when the ovum gets lost?

A. If the ovum is fertilized and drops into the belly cavity, the individual is supposed to have an abdominal tumor. Operation reveals the presence of the fetus developing free in the abdominal cavities. It is one of those blunders which I referred to which cannot be explained except by saying that the human body is trying hard to do a difficult thing, and is doing the best it knows how.

The Nervous System

The brain, the spinal cord, and the nerve fibres running from it to the muscles and organs of the body, are the most important parts of the nervous system for an audience such as this book means to reach. The brain

occupies the dome of the skull above a horizontal line drawn from the eyebrows to the back of the head. Its hindmost and lowest portion is prolonged into a tail like a Chinaman's queue, and this tail (the "spinal cord") runs down inside the bony column of the spine. Between each two stones of this column (or between each two vertebræ) are windows (see Fig. 5, p. 8) — through which *nerves* come out of the spinal cord like bunches of white hair. Each hair later separates from the bunch and goes to a particular muscle or organ. Return branches come back from the surface of the body and from its internal organs, so that the nerves are like the telegraph wires to and from a town — often bunched together in cables, but each carrying its own individual message to or from the brain.

The brain itself is like the central switchboard of a telephone system with wires leading into and out of it. The wires are the nerves: one set (*sensory nerves*) leading *in* from the eye, the ear, the nose, the mouth, the skin, and all the bodily organs; another set (*motor nerves*) leading out to the muscles and carrying commands for movement.

The brain is like the telephone operator, *receiving* messages of sight, sound, touch, smell, and taste, and messages of pain from internal organs, *interpreting* those messages and working them up in thought, then *sending out* commands for word or deed through the muscles. When the brain is wounded or diseased it cannot receive messages (unconsciousness), or it can-

not interpret them (insanity or feeble-mindedness) or it cannot *send out* messages of movement (paralysis, speechlessness).

With its substations in the spinal cord and elsewhere the brain coördinates and marshals the organs and energies of the body so that they work together. Thus *the nervous system as a whole integrates* or centres all that goes on in the hundreds of special activities which make up man.

The different parts of the brain correspond to different activities of the body. The right arm and leg, with the right half of the body, are moved by the left half of the brain, while the right half of the brain corresponds similarly to the left side of the body. Speech, hearing, and sight have corresponding *centres* in the brain, so that injury in one spot makes the patient speechless, in another blind, in another deaf. Still other spots, or centres, preside over the functions of breathing, vomiting, etc., so that brain disease may produce vomiting, or may stop respiration.

Some account of the eye, the ear and the ductless glands will be given in the chapters on diseases of those organs.

CHAPTER II

DISEASES OF THE RESPIRATORY SYSTEM

Diseases of the Tonsils

TONSILLITIS, the inflammation of the little glands at the beginning of the throat just back of the tongue on each side, is a disease which we are realizing more and more every year to be very important as a part of other diseases. Tonsillitis in itself is disagreeable or painful, not dangerous. But it is apparently the beginning of dangerous diseases in the heart, kidneys, and in the joints. We know to-day, what we did not know in my student days, that many if not most cases of "acute rheumatism," so called, that is, inflammation of many joints at once, start with disease of the tonsils. To-day as we take histories in hospital wards it is unusual to see a case of rheumatism which we cannot trace to tonsillitis or to some other inflammation of the mouth. In old times we did not know enough to ask patients about this connection and so we did not find it.

I am not going to try to teach bacteriology, but there are a few germs which are mentioned so often in the diagnoses of physicians that I must mention them. Amongst these is the *streptococcus*, a micro-organism growing in chains and multiplying by division. That is the germ concerned in septic sore throat or tonsillitis. The same germ is carried by the blood from there to the

joints, causing acute rheumatism; to the heart, causing valvular heart disease; and probably to the brain, causing chorea. We used to say that rheumatism is the cause of heart disease. We now say that both are caused by a single germ, the streptococcus, which is apt to show itself first in the tonsils. It may multiply in the deep pockets about the roots of the teeth. Hence rheumatism may be due to abscesses about the teeth. Or the streptococcus may start its work in the cavity of the cheek bones, which is called the *antrum*, and in a variety of other places.

But the germ of tonsillitis hits not merely the joints and the brain and the heart; it also hits the kidneys, and I think the most hopeful thing we have learned about kidney disease in the last ten years is that it is sometimes caused by the germ of sore throats. Chronic Bright's disease represents now one of the most hopeless of problems. We shall never cure it, but perhaps we may learn to prevent it by preventing outbreaks of sore throat coming from infected milk supplies. Thus we may reasonably hope that by campaigns for pure milk we are preventing kidney disease years later — for it is years later that the kidney effects of the streptococcus are most apt to appear.

We realize, then, that tonsillitis is a serious disease even though it may run its course in a few days and seem to be nothing but a bad cold. It is a *very* bad cold, and it may pull a person down as much as an attack of pneumonia. That should be realized by social work-

ers as well as by physicians. A person may need as much time for convalescence after tonsillitis as after pneumonia. For since the germs have been free in the blood stream and so have poisoned the whole body, the whole body needs time to recover. Many of these germs pass out of the body through the kidneys, and it is for that reason that they sometimes stay there. How else they get out of the body we do not know. Most of them are presumably killed by the forces — whatever those forces are — that fight on our side against germs in every infectious disease. Some physicians believe that our defenders are the leucocytes, the white corpuscles of the blood; others believe that they are purely fluid substances circulating in the blood. Anyway it is our forces of resistance, whether organized or unorganized, that do most of the work of cure in germ disease.

Quinsy sore throat is that type of tonsillitis that produces a deep abscess. Any tonsillitis may run into that. It is more painful, but not any more serious in its results. The abscess may break and empty itself or may need to be opened with a knife.

Nowadays we believe in taking out the tonsils whenever a person has shown any signs of acute trouble in many joints, or whenever a person has repeated attacks of tonsillitis. We may have half a dozen attacks with no ill result, but the seventh may be very serious. I am not enthusiastic over taking out the tonsils for many of the reasons for which they are removed, such

as simple enlargement, but for their bad results on other parts of the body they should often come out, in my opinion. If they are thoroughly removed by a man who knows his job, they rarely form again and a person is free from that particular danger.

There is no local treatment of the throat that will cure or prevent tonsillitis; spraying and gargling may give some temporary relief to persons who like them, but they will not cure, for it is like spraying the front of a house when the fire is in the back yard. We hope that improved milk supplies and pasteurization may prevent a good deal of the tonsillitis now so rampant.

Streptococci attack the antrum, producing pus or "empyema of the antrum." They can attack any tissue of the body. In the pharynx they produce *pharyngitis*, in the larynx, *laryngitis*, in the nose, *coryza*, and in the bronchi *bronchitis*. The streptococcus is the most universal invader of the body, and I suppose, directly or indirectly, it causes more deaths than any other germ. But other germs can also cause any of the inflammations just mentioned.

Hypertrophied tonsils and adenoids in children. Children usually have four "tonsils" or bunches of lymph gland tissue at the entrance to the throat. Those at each side opposite the base of the tongue are usually called "*the* tonsils"; *faucial tonsils* is their technical name.

A third, *the adenoid*, is at the junction of the nasal cavities with the throat.

A fourth, the *lingual tonsil*, is at the root of the tongue, farther down the throat.

Besides these four chief islands of tissue there are countless smaller, unnamed islets and reefs of tissue scattered about, especially on the back wall of the throat.

The use of all these lumps no one knows. They ordinarily do no harm, but if the adenoid is very large it may block nasal breathing, and if any of the tonsils are frequently inflamed they may lead to attacks of ear trouble. For these two reasons they are often and properly removed.

But if they are merely prominent and noticeable in the throat without preventing the child from breathing through its nose, without blocking the tubes which lead from the throat to the ears (Eustachian tubes), and without frequent "sore throats," there is, I think, no good reason for removing them. Many operations are done merely for "big tonsils," or for "tonsils and adenoids," when there is no evidence of any harm in them or of any need for the operation.

Nasal obstruction (with resultant mouth-breathing); *frequent earaches* (or a sense that the ears are "stuffed up"); *frequent sore throats* (tonsillitis), are the chief local reasons for removing tonsils and adenoids.

In addition to these *local* reasons for operation there are the *distant* or *constitutional* reasons, such as heart trouble, joint trouble, or unexplained fever. When these troubles are present it is always *possible* that the

tonsils and inflammation in them are the cause. Hence an *experimental operation* is often justified in order that we may remove a *possible* cause of serious disease in other organs. Any tonsil or adenoid, large or small, healthy-looking or obviously diseased, may justifiably be removed as an experiment when there is disease of heart or joints unexplained. But we cannot truly say, "Operate, for it can't do harm and may do good." It may do harm. Hemorrhage and other very serious ill effects occur once in so often with almost every operator, and these possibilities must be balanced against the possible good of the operation. If the latter is considerable, it outweighs the former, *provided* a first-rate operator is available. The best operators are those of largest experience with this particular operation and those most surely free from any taint of commercialism.

Tonsils and adenoids usually shrivel up and disappear or become harmless about the age of puberty (twelve to sixteen). Hence the nearer the child to this age, the less reason (other things being equal) for operating.

To count as "a defect" every prominent tonsil or adenoid found in the routine examination of school children is folly.

Diseases of the Nasal Cavities

are important to understand chiefly because so many unnecessary operations are done upon them. There are a great number of symptoms at a distance from the

nasal cavity which are supposed by some physicians, especially those who make a specialty of diseases of the nose and throat, to be due to conditions in that cavity, and in consequence there are a great many over-enthusiastic operations upon the *septum* (the cartilage which divides the two sides of the nose) and upon the curled-up or "*turbinate*" *bones* on either side of that septum. The main thing is for the patient to be sure, whenever such an operation is proposed, that it is really necessary. It is often done without sufficient cause, and with resulting disappointment to the patient and diminution of his income. Within this year I have had occasion to save two social workers from unnecessary operations in this field by recommending them to a nose and throat specialist who never operates unless it is necessary. We should search out that type of surgeon and be sure that our friends do not go through unnecessary disappointment and loss of money because of useless or faddish operations. Probably the two regions of the body in which unnecessary operations are most often done are the nose and the female genital tract.

In the nose and behind it, where it opens into the throat, a great many persons have "*catarrh*," a chronic, nearly harmless inflammation which causes phlegm to drop down into the throat. Sometimes this disease can be checked by stopping tobacco or by moving to a warm, dry, clear climate, or by getting out of a dusty trade. Local treatment by sprays, washes, and gargles

is nearly or quite useless, and as a rule the best way is to grin and bear the very moderate inconvenience of the catarrh. It has no connection with serious diseases like tonsillitis, pneumonia, or tuberculosis, and rarely if ever produces joint troubles.

Of the *larynx* I have but little to say before we leave this section of the body. Ordinary *laryngitis* produces the hoarseness and finally the loss of voice that we get as part of a bad cold, but it is a rather interesting thing that men and women react very differently to it. When a man has laryngitis his voice becomes a deep bass; he growls a few days and then is well. But when a woman with a soprano voice has laryngitis, she does not become an alto; she does not as a rule have any change in the pitch of her voice. She "loses her voice" altogether, and after the inflammation has passed away she often has considerable trouble in *finding* her voice again. The nervous connection between the brain and the vocal cords, the arrangement whereby she can speak when she wants to speak, has apparently been broken during the period of laryngeal inflammation, and after this has gone it is sometimes very difficult to get the connection established again. The nerve coming from the brain to the vocal cord is not broken by disease; it is only the function of the nerve that is in abeyance. The communication between the will-act in the mind and the movement of the muscle, a communication which we suppose goes through the nerve, is somehow lost and

must somehow (by shock, or fear, or surprise) be found again.

Laryngologists get very skilful in devising tricks whereby this type of voicelessness or *aphonia* can be relieved. Sometimes a doctor will startle his voiceless patient into *singing*, which can then be reduced to speaking; or he starts her coughing or making some noise, after which speech connection is restored. Because these manœuvres have very little medicine and a good deal of psychology in them, the impression that these cases are all "hysterical" has gained ground. Of course there are cases of true hysterical aphonia, but a good many persons are accused of it who have this other type, starting in an ordinary cold. The prognosis is perfectly good in all cases. The voice always comes back, and that can be said to the patient with entire truth and confidence.

The question is often asked, in connection with operations on the nose or throat, whether a social worker should "steer" a patient away from one doctor and to another. I think it is her job, like the job of any other friend, to *try* to get the patient in contact with somebody who will make a right diagnosis. These are delicate situations, but if a person is really suffering, whether from medical ignorance or from any other cause, social workers should not fail to do what they can to get him in touch with the best sources of health. Of course a social worker ought to be distrustful of her own judgment. She ought to be as sure as she possibly

can be before she takes it upon herself to steer a person away from one doctor to another. The necessity is comparatively rare. But it exists.

Diseases of the Lungs

I shall skip *tuberculosis*, because it is the one disease which has been written up for social workers repeatedly, and especially well by Dr. John B. Hawes, 2d, of Boston.[1]

First, *bronchitis*. For a social worker the most important thing about bronchitis is to realize that it is rather rare, and that hence we should always suspect the diagnosis. It is generally a wrong diagnosis. The better the physician, the more seldom he makes this diagnosis. Most diagnoses of chronic bronchitis are really tuberculosis or heart disease. Most of us can recollect cases in our own experience which have been called "bronchitis" before the real nature of the disease was recognized (phthisis or heart disease as a rule). This mistake happens occasionally even under the best conditions. The patient, when last she was seen, had what was called bronchitis; seeing her four months later, the diagnosis is obviously tuberculosis in an advanced stage. The golden moment has passed by.

Children certainly do have acute bronchitis quite frequently, without the diagnosis needing to be re-

[1] John B. Hawes, 2d, M.D.: *Early Pulmonary Tuberculosis: Diagnosis, Prognosis, and Treatment.* New York: William Wood & Co. 1913.

vised or suspected, but even in children I think it is a good plan for us to be dubious of a diagnosis of bronchitis unless made by an expert. I always doubt my own diagnosis in such cases. There are very few physicians who are capable of making it correctly. This is especially true of chronic bronchitis. (*Chronic* means of long standing. *Acute* means short, not necessarily severe. A cold in the head is an *acute coryza.*) A chronic bronchitis is a long bronchitis. Even in children that is a great rarity.

In adults, and especially in elderly men, the diagnosis of *chronic bronchitis* should generally be revised to read *heart disease* — heart disease with poor circulation through the lung and with resulting cough. When, owing to disease of the heart, the blood does not circulate freely through the lung, it oozes out of the vessels and into the lung itself and there irritates the lung until it is drained by cough. That oozing is swelling or *edema of the lungs*, a symptom of heart disease and not an independent disease.

Chronic bronchitis, in the few cases in which it really does exist and is not mistaken for phthisis or heart disease, almost never kills. People should insist, in this and in other diseases, on knowing, not how to diagnose, but what to expect in any common disease; that is, *prognosis*, or the outlook. The expectations from a given diagnosis is a thing I think social workers and laymen generally cannot know too much of, for the social plan depends upon this. If the person is

going to live but a few days, we take a different course from that which we should take if he is likely to recover.

Chronic bronchitis does not disable people altogether, and never kills. It gives a chronic cough with no tubercle bacilli discoverable in the sputum and with a sound heart. It often results in stretching the bronchi, and the result is a disease known as *bronchiectasis*, which means the stretching of a bronchus. Secretions of phlegm and pus accumulate there and have to be emptied out with an attack of cough from time to time. This is a rather rare complication of chronic bronchitis, seen more often in young people than in old people. It is too rare to warrant my going into more details about it.

The *treatment of coughs*, due to chronic bronchitis and other causes, should be limited to those which keep people awake or seriously exhaust them. A cough in itself is usually a good thing, because it helps to take out of the lung what ought to come out. But like other of the self-protecting arrangements of the human body, the cough reflex now and then overdoes things. It is very characteristic of the human body to make most ingenious and intelligent attempts to rid itself of disease, and to accomplish it in part, *but then to overdo* the attempt. A cough sometimes becomes a habit, goes on when there is no need for it, and keeps people awake. Then it should be checked. We can all help to train people out of the idea that every cough needs

medicine. In the first place, very few coughs can be stopped by medicine, and in the second, the drug would probably do harm if it could check the cough.

The well-trained physician knows which cough should be stopped, and when it should be stopped. He has at his disposal two classes of medicines about which it is well to know something. One, the opiates, check cough by checking the sensation which demands cough, the tickle. The form of opiate most often used is *heroin*, and like all the other opiates, it cannot now be obtained in this country without a special prescription of which account is kept by the United States Government, so that we now know who is using and who is over-using these drugs. To stop a cough no patient should take heroin, codeia or any opiate for more than a week. We must realize that patients are in danger of contracting a heroin habit, just as much as a morphia habit. Heroin does not have the bad immediate results of morphia. If one takes morphia to-day he will feel miserable to-morrow, but if he takes heroin he will feel very well to-morrow. Hence its evils are all the more insidious. Yet heroin does no harm if it is not kept up more than a few days, and it is a wonderful drug for stopping night cough.

The other medicines for cough are those which increase the amount of expectoration when it is scanty and will not come up. The best of these is iodide of potassium, the familiar drug which the doctor calls K.I. It is important to know this, because every now

and then I have found a social worker making the mistake of thinking that a patient had syphilis because he was taking K.I. and K.I. is so often used for syphilis. But this drug has several other uses, one of these being for the relief of cough. Another use is for lead poisoning. We must not, therefore, suspect a patient of syphilis merely because he has taken K.I.

Besides these two groups of cough medicines there are innumerable others still given by some doctors, because the patient demands it, but they are for the most part useless.

Asthma

Asthma is a disease which begins in early youth. If we hear of any one who is supposed to have contracted asthma or to show asthma past middle life, we can usually be sure that the diagnosis is wrong. This is important because in such cases the true diagnosis is usually that of a progressive disease; namely, kidney trouble or heart trouble. Asthma begins in youth and is often outgrown or spontaneously cures itself as life advances. There is no cure for the disease, but, as I have said, it may get well of itself. Climate helps many, any climate different from that in which they got the disease.

Asthma is a paroxysm of short breath with wheezing and cough, coming on suddenly, often at night, lasting hours or at the most a day or two, and then leaving a person altogether. The disease consists in a series of

such paroxysms. To one who has not seen it before, it is most alarming, but nobody ever dies of it. The person is often waked from sleep, jumps out of bed, runs to the window, but may be all right and go to business in the morning. It is set up by various dusts. Some people get it from hay along with "hay fever" or without it. Some people get it from feathers; e.g., sleeping on a feather pillow. Some people get it from the breath of a horse, after driving behind one.

Asthma lasts for years, but does not generally handicap a person very seriously in relation to work. Ignorant people and some not so ignorant waste their money on drugs for it and especially on those containing cocaine, a dangerous, habit-forming drug.

Emphysema means a distension, a blowing-up of the lungs, with loss of their elasticity, so that breathing is not easily carried on. Normally the lungs are expanded, as we breathe in, by muscular effort. As we breathe out, they collapse by elasticity, like a rubber strap. Take away that elasticity and they do not empty themselves easily, but remain permanently in the position of full inspiration. The disease happens most often in elderly men, without known cause; less often in women. It is incurable. Emphysema is usually only a small portion of the true diagnosis. Patients have emphysema *with* something else — usually with asthma or bronchitis, and especially often with arteriosclerosis (hardening of the arteries). The chief thing to know is that it gives shortness of breath with cough and

wheezing, and so moderately but permanently diminishes working power, although it is hard to distinguish what it takes away from the man from what is taken away by the accompanying arteriosclerosis. There is no treatment, as I have said, and it goes on for a great many years. Finally the heart fails unless the patient dies of some other disease.

Pleural Effusion

(*a*) *Purulent Pleurisy.* It is important to distinguish *emphysema* from another disease the name of which, *empyema*, is a good deal like it, so that mistakes may occur. Empyema is literally a collection of pus in any portion of the body. Thus we may have empyema of the antrum or of the gall-bladder. But when one says "empyema" alone, one means a collection of *pus in the pleura;* that is, in the empty sac between the lungs and the chest wall.

Empyema, or purulent pleurisy, has two main types, the post-pneumonic and the tuberculous. *Post-pneumonic empyema*, a common sequel of pneumonia, is usually cured by surgical drainage, but is often overlooked and mistaken for a failure of the pneumonia to "resolve" or get well as it ordinarily does within ten days. Empyema, like any collection of pus, produces fever and chills for weeks or months. Whenever a person has fever and chills, — if malaria can be excluded, — then pus *somewhere* in the body is the probable cause. Any collection of pus causes a series of chills

once a day or oftener with irregular fever, from which the patient becomes emaciated and weak.

With surgical drainage a cure is complete within a few months in practically every case of post-pneumonic empyema. If an empyema does not heal after "drainage," — that is, after two or three inches of a rib have been taken out, the pus removed, and a drainage tube put in, — then it is in all probability the other type, *tuberculous*.

I saw in my clinic the other day a woman whom I first attended in 1899; she has had a discharging empyema ever since. She has tuberculosis of the lungs with accompanying tuberculosis of the pleura and a discharging empyema. Practically never does a tuberculous empyema heal. The person has a chronic *sinus*, which means a hole leading from the empyema inside to the external world, and constantly discharging pus. Usually such patients die of tuberculosis. Yet the woman whom I saw the other day has been doing her housework through most of these years in spite of some fever, and now weighs two hundred pounds. She is an old established figure in the clinic. But most people die of the trouble within a few years.

We recognize, then, two types of empyema with different prognoses, — the one good, short, the other bad, long; death is finally produced through the self-poisoning or absorption of poison from the purulent pocket.

(*b*) *Tuberculous Pleurisy* (*"dry" or serous*). There are other types of pleurisy, of which two are especially

important, — *dry pleurisy* and *pleurisy with serous effusion.* Dry pleurisy is the cause of a pain in the side which lasts days or possibly weeks, and goes off usually after causing adhesions of the two pleural surfaces. The lung sticks to the chest wall, extensive scars unite the two, and that is the end of it. If it does no more than that, it does no harm. Often it goes on to "effusion"; that is, a serous fluid, like the fluid part of the blood, clear, pale straw-colored, is poured into the pleura, — a pint, a quart, even more in severe cases, — so that the danger to life may be considerable from pressure on the heart. This danger is very easily removed by "tapping the chest." Tapping is almost the only operation still allowed to medical men who are not surgeons. It consists merely in putting a hollow needle between the ribs (which under cocaine causes no pain), and letting the fluid run out through that needle.

This type of pleurisy can be cured in most cases by a single tapping. In the other cases two tappings are needed, practically never three.

Dry pleurisy and pleurisy with effusion almost always mean tuberculosis — not necessarily tuberculosis of the lungs, but tuberculosis of the pleura, with a possibility of its extension to the lung or to other organs. To social workers the important point is that these patients should be treated exactly as if they had tuberculosis of the lungs. They should be given the benefits of a sanatorium if possible, and taught all that we teach tuberculosis patients about food, rest, and fresh

air. A great many now develop phthisis, but most would not, in all probability, if they were treated from the start like patients with phthisis.

Pneumonia

Pneumonia is an acute germ disease which, in practically every case, is over within ten days. It is important to know this because if we hear of a person who has what is supposed to be pneumonia and whose illness hangs on for weeks, we may be very suspicious. The true diagnosis is usually tuberculosis or empyema. A person needs good nursing and fresh air in pneumonia, and that is about all. There is very little that we physicians can do at the present time to cure pneumonia. It is a very sharp illness, but short, and the drain upon the patient's finances is not often great if we have the true diagnosis. About twenty-five per cent of all adult cases die. When it occurs in alcoholics, about seventy-five per cent die. This is one of the best established examples of the harm that alcohol does in people whom it does not make drunk. A man who is never drunk at all, but is chronically alcoholic, when he gets pneumonia is three times as apt to die as the total abstainer.

The doctor is almost never to blame for the death in pneumonia, nor responsible for the recovery in favorable cases. In children outdoor treatment seems to help very much, but children do much better than adults anyway.

CHAPTER III

DISEASES OF THE HEART AND ARTERIES

Diseases of the Heart

DISEASES of the heart seldom manifest themselves by pain, or if there is pain it is usually a subordinate element. It is important to know that a pain in the left side of the chest is usually not heart disease, just as a pain in the kidneys usually means sound kidneys. Heart disease manifests itself ordinarily by shortness of breath and swelling of the legs: by shortness of the breath, because the lungs are blocked owing to poor circulation through them; by swelling of the legs, because it takes more work to get the blood up from the lowest parts of the body — that is, from the legs — than to get it down from the head and arms. Therefore, when the heart fails, the damage is seen first in that portion of the blood stream which takes most work on the part of the heart to keep going. A little later the patient becomes unable to lie down at night because he cannot breathe, and with that comes a cough which is very hard to relieve until the heart itself is relieved.

From the layman's point of view the most important point about heart disease is its *prognosis*, and from that standpoint I shall divide the cases into four groups:

(1) Rheumatic
(2) Syphilitic
(3) Arteriosclerotic
(4) Nephritic

By *rheumatic heart disease* one means a type which seems to originate either in what is called "acute rheumatism," attacking many joints, or in tonsillitis, which is the source of most cases of rheumatism, or in chorea, which is probably a manifestation of the same disease in the brain. The streptococcus, the organism which is back of this disease, may show itself first in the throat (tonsillitis), or in the brain (chorea), in the joints (rheumatism), or in the heart as *endocarditis* (inflammation of the heart valves). Endocarditis means literally inflammation of the inside of the heart, but practically of that portion of the inside of the heart which is on the valves. It does no known harm unless it is on or near the valves.

Rheumatic heart disease begins usually in childhood. It rarely begins after twenty-one, and is almost twice as common in girls as in boys. It is *the* children's heart disease, and practically the only one, with the exception of the rare congenital defects of the heart.

This type of heart disease carries the best prognosis of the four. People can live fifty years with it and die of something else. They *can*, but they generally do not, because, before they get to be twenty-one, fresh acute crops of the streptococcus get in upon the heart and extend the damage done the first time. These recurrent acute attacks in children result in the heart's becoming so badly damaged that it cannot get along. This usually occurs before twenty-one; hence, we say to the parents of such children, "If you can take extra

care of your children up to twenty-one, even though the heart seems to be doing pretty poor work, the chances are good that it will settle down and be a useful organ for the rest of life." I know of one case in my own observation where the trouble has existed for twenty-seven years. I happened to make a guess at the diagnosis just before I became a medical student, and it was confirmed by an expert. That "patient" can still do all his work and can enter athletics as well.

The possibility of going on in this way is dependent upon what we call *good compensation.* A well-compensated case of heart disease may leave its possessor able to work for many years. "Compensation" means that the heart strengthens itself, thickens its own muscle, and enlarges its own cavities so as to overcome the defects in its valves. For instance, if a valve leaks, so that the fluid which should go ahead goes back instead, that leak is compensated by extra strength in the pumping wall of the heart. The heart may grow to three or four times its natural weight in this process of compensating for diseased valves. In time it may thus become so strong that a man with diseased valves may be able to play golf or tennis, and even to swim. *Failure of compensation* occurs in children mostly when they get acute febrile attacks of fresh poisoning from the streptococcus. When compensation fails, either from this cause or from overexertion, we get the symptoms mentioned above, — swelled feet, short breath, difficulty in lying down at night, finally general dropsy.

The next type of heart disease, the *syphilitic*, gives with one exception the worst prognosis. The syphilitic heart does not often survive five years. It is seen in *young and middle-aged men*, far less often in women, almost never in children, seldom in the old. The diagnosis rests largely upon the blood test (the "Wassermann reaction") and the history, and often is not made because the Wassermann test is not made. Yet correct diagnosis is important, because the outlook is quite different and the treatment is different from that of any other type of heart disease. The treatment is that of syphilis plus certain measures advisable in all kinds of heart trouble.

The third type, *arteriosclerotic heart disease*, is the old man's, less often the old woman's, heart trouble — the failing heart of old age. It practically always goes with high blood pressure as well as with degeneration of the arteries in various parts of the body. Hardening of the arteries, what is called "arteriosclerosis," and high blood pressure, mean that the tubes through which the blood flows become smaller and stiffer than they normally are. Hence it is more work for the heart to force the blood through these small stiff tubes than it was through the elastic vessels of youth. The heart, therefore, is called upon for more work; it "compensates," or hypertrophies as we say; that is, it gets larger. *Hypertrophy* means simply growing larger. When one exercises one's biceps muscle, it hypertrophies; when one overworks one's heart, it hypertro-

phies. Thus for years the trouble is compensated so that these people may get along fairly well. In time the load becomes too great, the heart weakens, and death comes.

Next to the rheumatic type, the arteriosclerotic heart gives the best prognosis. People with this type of heart trouble may live ten or fifteen years. They are more or less seriously disabled all the time, but capable of enjoying life if they do not try to do anything strenuous. They have no working future as patients with rheumatic hearts have, but they do not die rapidly, and in the early years of the trouble suffer little if they are quiet.

It is in this type chiefly that one sees pain in the heart. I have said that heart pain is rare. But in this type we do occasionally get the characteristic heart pain, *angina pectoris*. Angina pectoris means a pain in the region of the heart which comes on after exertion or emotion and is relieved by rest. We often see in the streets a pathetic figure pretending to look into the shop windows when he does not really want to. Perhaps he has angina, has been caught by this pain and must stop; to pretend that he is well he looks around at the scenery or into shop windows. After a few minutes' rest he is able to crawl on again. Going uphill or going against the wind is especially hard for such patients. Any emotion — fear, anger — in the arteriosclerotic will produce the same pain by making the heart beat violently.

There are many causes for angina pectoris, but arteriosclerosis is the commonest cause. Angina comes in younger people from nervous causes and is then not at all serious. But when angina is part of arteriosclerosis it is always serious. There is no other pain in the trunk brought on by emotion or exertion and relieved by rest.

The nights are very bad when compensation begins to fail in any type of heart disease; and for years the arteriosclerotic may have bad nights. I remember a man who for a considerable number of months never lay down at night, but slept in a Morris chair, and yet went to business next morning. He had learned to sleep well sitting up. In late stages of the disease patients are often more or less delirious. They may get out of bed — they do not know just why; or they are mildly out of their heads during the night; and yet all right again in the daytime. They sometimes go back on their best friends, or make the wrong kind of a will, because their brains are ill nourished.

The nephritic type of heart disease is that which comes on as the result of kidney disease. Of kidney disease itself I shall speak later. It results in holding back in the blood poisonous waste products which should be passed out by the urine. Those poisons, as they circulate in the blood, stimulate the blood vessels around them to contract upon their contents, and this spasm produces high blood pressure. *There are two main causes of high blood pressure — arteriosclerosis and*

kidney trouble: arteriosclerosis through hardening of the arteries, kidney trouble through making poisons circulate in the arteries and stimulate the muscular fibres in the arteries to close in upon their contents. As a result of high blood pressure the heart has to work harder and harder until it gives out. In chronic kidney trouble failure comes in about eighteen months from the patient's earliest complaint, making this the worst type of heart disease that we have.

When we are told that a person in whom we are interested has heart disease, we must try to get from the doctor *a diagnosis including a prognosis.* That will tell us which type of heart disease we are dealing with. The different types are entirely different propositions from the point of view of making a plan for the patient. To people of the first type, patients with rheumatic heart disease, we can truthfully say, "You must try to take care of yourself for months or years; if you do you will have a good chance of living a useful and happy life." You cannot truthfully say this to people with any of the other three types of heart trouble. You can say to people of the arteriosclerotic type, that with care and rest they will live along fairly comfortably for some years, but that is all. The syphilitic type is worse and the nephritic worst of all.

The *treatment* of all types of heart disease is rest and digitalis, plus some measures which empty out the dropsical fluid from the tissues. It is really miraculous

what rest can do, without anything else at all, for the rheumatic types of heart disease after compensation has failed. A person who has seemed to be at death's door may recover and live for many years, provided he can rest. The problem of rest in a young, active child is of course a very difficult one, and I do not think any community has ever considered it on a large scale. We take the problem of *lung disease* — tuberculosis — very seriously, but the problem of *heart disease*, which is far larger and causes just as many sufferings and deaths, we do not yet take seriously. The ingenuity of the social worker, in providing games, etc., may save the life of the child in rheumatic heart disease, by keeping it quiet for months at a time. The doctor may be powerless and the mother is often equally powerless. But the social worker may make it possible to keep the child quiet, especially if she uses first-rate brains. He won't stay quiet and read improving books, but he will sometimes use his hands on something of interest.

Questions and Answers

Q. Are cardiac patients to be forbidden all exercise?

A. No, I should not say as much. They should do no work as long as they have what the doctors call "acute symptoms," which are fever, short breath, dropsy, cough, and scanty urine. Later they are *better for taking such exercise as they can take without getting short of breath.*

Q. Do you often get a nervous condition as a result of heart trouble, so that people find it very difficult to sit still?

A. The choreic patient is in exactly that condition; he

wriggles all the time. The arteriosclerotic is often very restless. There is another type of restlessness (local twitchings about the face) in persons who are merely "nervous," because they always were so. *This has no relation to heart trouble.* I do not think I can say that heart disease ever makes a person restless. Chorea accompanies heart trouble, but is not caused by it.

Q. In talking to some heart cases I get the impression that they would be relieved if they could get up and get about?

A. With elderly people it is sometimes almost impossible to insist on rest in bed. They have a constant impulse to get their feet out and on the floor and sometimes they are content then. But the greatest difficulty of keeping people quiet in this disease, as in other diseases, is that idleness turns the mind in upon one's self. This is bad, of course; a cardiac patient can get neurasthenic just as well as anybody else. He gets to counting his pulse sometimes and then is much worse off than if he had not been trying to rest. Doctors sometimes have to steer a very difficult course between making a neurasthenic by rest and breaking compensation by allowing the patient to work.

Q. When does arteriosclerosis begin?

A. It may begin at any age. Congenital syphilitics may have it in childhood, but it *generally shows itself after forty.*

Q. Why do more men have it than women?

A. Syphilis is probably the greatest single cause of arteriosclerosis and more men have that than women. Hard muscular work is probably a contributing cause, and men do more of this than women. Alcohol is a contributing cause, I think, in syphilitic cases. All these three causes are found in men more often than in women.

Q. How does worry harm a person with heart disease?

A. In the first place, by preventing sleep. Of course, anything that tires a person tires his heart also by disturbing his compensation. Moreover, insomnia injures nutrition and

the heart patient needs his nutrition. Again, worry raises blood pressure, and in the cases in which blood pressure is a serious feature worry thus directly adds to the cause of the whole trouble.

Diseases of the Arteries

Arteriosclerosis is the process of growing old. It is not the cause of growing old — it *is* growing old. We are as old as our arteries. A person of sixty may have the arteries of forty; then he *is* forty, whatever the calendar says. Arteriosclerosis probably begins soon after birth. It is quite distinct at twenty-one in the normal person,[1] and goes on and on from that time. It does not begin to do obvious harm as a rule until the later years of life, and in many cases it does no known harm at all. As it affects the whole arterial tree down to its smallest twigs, it may affect any organ or tissue in the body. This condition, while we call it a disease, is a very queer disease, because it is one which the whole human race has almost from birth. The sick man merely has more of it than the rest of us, or has it in a more serious form, or in a more serious place — as in the brain, or in the arteries of his heart. If he had the same amount of trouble in the arteries of his leg or his arm, it might do no harm, but in the heart or brain it often proves fatal. Hence, in the apparently chance distribution of the amount of arteriosclerosis here or

[1] Thayer and Fabyan: "Studies on Arteriosclerosis, with Special Reference to the Radial Artery." *American Journal of the Medical Sciences*, 1907, vol. 134, p. 811.

there in the body, *it is for most of us like gray hair, with which, but not because of which, we die.* In others it is the cause, and the only cause, of death.

Merely because a person is found to have arteriosclerosis, he does not need to take his ailment very seriously. Elderly people hear that they have high blood pressure and are apt to be terrified for fear that an artery is going to break. But in fact it seldom does. Having arteriosclerosis, even having high blood pressure, does not necessarily mean anything serious. It is both difficult and important to steer the right course here in avoiding both anxiety and unpreparedness. Social workers should help physicians to explain this disease to the laity.

Arteriosclerosis *of the brain* is the usual cause of apoplexy or cerebral hemorrhage. When we hear that an old man has had "a stroke" or "a shock," the chances are that he has had arteriosclerosis with high blood pressure and that he happened to have a weak spot in one of the arteries of the brain. That gives way, the blood is poured out into the brain, and the person dies or is paralyzed on one half of the body. Apoplexy generally recurs. The first attack is usually not fatal. A little arterial twig gives way, but the blood is absorbed, the person recovers partially or wholly; later the weak branches give way in another and more serious place. In the brain, arteriosclerosis also leads to chronic insanity in a form that may be almost indistinguishable from *paresis* or *dementia paralytica.*

Milder cases of arteriosclerosis in the brain cause trouble, — some attacks of dizziness, sometimes transitory, unconsciousness, speechlessness or paralysis. Vomiting often comes with these attacks, hence the stomach may be wrongly blamed.

The tendency to dizzy spells usually passes off in a year or two.

Arteriosclerosis *in the heart* gives us the type of heart disease which I have already described, with or without angina.

Arteriosclerosis *of the kidney* gives a type of chronic kidney trouble which leads slowly, not rapidly, to death.

Very often we have all these three forms of arteriosclerosis at once. We have some elements of arteriosclerosis in the brain, the heart, and the kidneys. We may hear that such a man is "breaking up all over" — a general breaking up. That may be true.

The prognosis of arteriosclerosis is very difficult to state. On the whole I think people usually get too much worried about it. Predictions are especially difficult because the disease affects different parts of the arterial tree in every case. One can have it for forty or fifty years and feel none the worse for it because it does not affect a vital spot. Another with much less trouble may die because an artery in the heart or in the brain happens to be affected.

We have no treatment. We do not want to see patients' time or money spent in efforts to cure that for

which there is no cure. It is just as curable as gray hair, and it may do as little harm. When it affects the heart we treat it by digitalis, rest, and relief of dropsy. Diet has, in my opinion, no considerable effect. But most of us agree in restricting meat to a small amount once a day and allowing, otherwise, most ordinary foods in moderation. Overeating is the commonest mistake and most people know when they have overeaten and can stop it when so advised. There have been many fads and fancies about this disease. Metchnikoff's sour-milk treatment is the best known, but there is nothing in it to the best of my knowledge.

Aneurism

The only other important disease of the arteries is *aneurism*. Aneurism is usually a part of syphilitic heart trouble. The big arterial tube (the aorta) at the top of the heart, turns over, goes down behind the heart, and divides. Syphilis, when it hits the aorta, for some reason, which none of us know, hits it oftenest in the arch just where the turn comes. *Syphilitic aortitis*, or syphilitic inflammation of the aorta, begins there and from there it spreads down to the heart valves, here causing the type of trouble that I have described.[1] But syphilitic aortitis also weakens the walls of the aorta so that it bulges out. That is aneurism. It may become as big as a child's head inside the chest, pressing on surrounding parts and causing pain, cough, and

[1] See page 70.

hoarseness. The danger is that the bulging aorta will rupture, with sudden death from hemorrhage. In cases that last any length of time, that is what happens, unless the patient dies of some other disease meantime.

The disease is incurable and usually runs its course within two years, as all types of syphilitic heart disease do. The first six inches of the aorta is the only important artery where one has aneurism. There are little aneurisms in the arteries of the legs and arms, most of which can be operated upon and cured. They are not syphilitic. Aneurism of the aorta is always syphilitic. (Aneurism of the heart is a very different thing and is so rare that I shall not describe it.)

Varicose Veins

There is but one common disease of the veins, *varicose veins*, which most of us have seen. The current in the veins is comparatively slow. In the arteries it is swift. But after the blood reassembles from the capillary sponge, it moves slowly and it has an unusually hard time going uphill from the legs to the heart. So we see varicose veins most in people who are obliged to stand a good deal. When they have to walk a good deal, the muscles push the blood along in the veins, but in standing the veins stretch and stretch and become curved and dilated, which is what the word *varicose* means: just as a river like the Mississippi becomes more and more curved as time goes on.

This has three common effects: the first itching and later eczema in the legs; the second is pain and swelling; the third is chronic ulcer — so-called *varicose ulcer*. (Rarely a vein breaks and a good deal of blood may be thus lost.) We see many of these cases in working people and among hospital out-patients. The bandaging of varicose ulcers used to be a thing which surgical internes dreaded because it went on day after day and week after week and its advantages were hard to see. That is all wrong and unnecessary. The difficulty is to persuade the patient and sometimes the surgeon that these ulcers can be cured by an operation, dissecting out the veins. What happens then? The answer is that we have a great many more veins than we have use for, so that when one set is cut out, another set takes up the blood and the person has better circulation than he had before. Nature has been profuse with veins, and by one of the wonderful processes of compensation, the small veins can enlarge and take up the blood formerly carried by the diseased vessels.

The cure, then, is operation. The palliative treatment is rest, keeping the feet up so that the force of gravity does not add to the stagnation; also bandaging with flannel bandages. In my student days I said so often to patients with varicose ulcer that I could say it in my sleep, "Buy a yard of flannel, cut it three inches wide on the bias, and sew the ends togother. Then wind it round the leg from below up." The point of cutting it on the bias is that you get more elasticity

in that way. These flannel bandages are useful palliatives for people who cannot or will not be operated upon. They support the veins and so sometimes prevent the development of ulcer.

Ulcer develops because the nutrition is so poor; the blood not flowing on as it should, the part becomes poorly nourished; then an ulcer forms and often stays for years.

It is important not to confound this ulcer with syphilitic ulcer. There are a great many syphilitic ulcers on the lower legs, and social workers are apt to assume that all chronic ulcers on the leg are syphilitic, thereby doing some people a great injustice. The distinction rests on the situation of the ulcer, on the Wassermann reaction, and on the evidence of the twisted veins in the non-syphilitic varicose cases.

Questions and Answers

Q. Do diseases of the heart have anything to do with varicose veins?

A. No. A person might have both diseases, but I do not think there is any connection.

Q. What is the connection between cough and heart disease?

A. When the heart does not pump properly, there is stagnation in the lungs, stagnation of the blood which the heart should send through swiftly. Stagnation results in the blood's oozing through the walls of the blood vessels in the lungs. Close around these blood vessels are the air spaces, which get filled up by this fluid part of the blood, called serum. This serum has then to be coughed out. It is not mucus, though it may be coughed up with mucus.

Q. What is the social worker to do when a physician wants a child treated for mitral regurgitation?

A. I should say that we should find out by questioning the doctor whether the child has good compensation or bad. If he has good compensation, he is to be allowed to do everything that other children do except in so far as he gets out of breath. He can play baseball so long as he does not pitch or run the bases. If the condition is uncompensated, he is to be put to bed until compensation returns.

CHAPTER IV

DISEASES OF THE GASTRO-INTESTINAL TRACT

THE *mouth* is the first part of the gastro-intestinal tract. In the mouth we encounter at once a burning question over which the majority of people and doctors are in doubt at the present time — that is, the importance of the teeth and the diseases of the teeth in relation to troubles in other parts of the body.

There are three disturbances of the teeth to which importance is attached, rightly or wrongly, by physicians and dentists, as causes of diseases at a distance from the mouth: —

(1) *Riggs' Disease*, of which the Latin name is *pyorrhea alveolaris*. (It is well to learn as fast as we can these roots of which the words of medicine are made up. *Pyo* always means pus, as in *pyopneumothorax*, *pyosalpinx*, etc. Wherever *rrhea* occurs, it means a running, a discharge, as in *gonorrhea*, *otorrhea*, *leucorrhea*. *Pyorrhea* in itself simply means a discharge of pus. *Pyorrhea alveolaris* means a running of pus from the jaw, the *alveolar process* as the jaw is called in anatomy.)

This is a disease ordinarily of people in middle life or older. The gums retract, uncovering the upper portions of the teeth; pus forms under the gum and is constantly discharged. This is an enormously common dis-

ease. Sometimes it seems as if everybody over forty had it. No one knows the cause of it. It has been vigorously maintained within a year that we had found the cause in a particular amœba, but that has been disproved, and I think it is safe to say to-day that nobody knows the cause of pyorrhea. In my opinion it is not a serious disease except locally, and is very seldom if ever the cause of disease anywhere else in the body. It is a bother, and it is dangerous from the point of view of the teeth themselves, but I think there is very little evidence that it harms us elsewhere.

The point which we need to understand, with this as with many other pus processes in the body, is that everything depends upon our powers of resistance. The mere presence of bacteria means nothing and does not constitute disease. Disease is the presence of these bacteria *plus our lack of resistance* to them. For example, we have all of us, all the time, bacteria in the deeper layers of our skin. We cannot wash them off — they are too deep in. But when our vitality is reduced, they produce a pimple or some other disease in the skin. Bacteria are always present in the mouth also, and are harmless until we get debilitated. Then they may produce inflammation in the throat or in the lungs. There are bacteria passing through the kidneys all the time. If anything reduces our general health, they take root and produce trouble there. The presence of bacteria in itself never causes disease. An enthusiastic dentist or some one else says, "How can it help being unhealthy

to have all this pus in your mouth?" But how can it be healthy to have all those millions of bacteria in our intestine? — yet apparently we not only tolerate but need them. So far as we know they are a necessary element in the process of digestion. They live with us, not on us, and help us to live.

(2) *Caries* of the teeth is the well-known decay, for which fillings in the teeth are made; when it penetrates deeper, it results in many of the abscesses about the roots of the teeth, and probably in the death of the teeth. It is a very different process from pyorrhea, which is on the outside and under the gum. Caries penetrates deeply into the teeth. Again I think it can be said that no one knows the cause of it. It could not go on without bacteria, but the presence of bacteria in itself is not enough to cause it. It is practically universal. Those who examine children in the public schools can find nearly one hundred per cent of "physical defects" by noting all the caries in their teeth and in calling all caries a "defect."

The one point of interest for us all, I think, is that pus pockets about the teeth certainly may be the cause of disease outside the mouth. The sole interesting question is how and when and how often they are the cause of disease outside the mouth. In many cases, certainly, they exist harmless for years, producing no symptoms whatever. Simply because the X-ray man finds a pocket or two about tooth roots, that is no reason for having them treated. It is for a sensible

and expert dentist to decide whether there is any reason for operating on that pus pocket.

The main diseases due to such pus pockets are diseases of the joints, which are often called *rheumatism*. Acute, painful disease of many joints may be caused by pus pockets about the teeth, or by pus in any one of a good many other situations. The more important, besides the teeth, are the tonsils, the antrum (inside the cheek bone), and the genito-urinary tract; less important are the inner ear, and possibly — not probably — the intestine. If a person, then, has an inflammation of many joints, an acute rheumatism, and no other cause is found except pus pockets about the teeth, it is well to have those pus pockets cleaned up. That is as far as I am yet willing to go. Some doctors believe that appendicitis, stomach ulcer and gall bladder disease are often due to streptococci coming from the tonsils or the teeth.

Fever, without joint trouble, may be produced in the same way, by pus about the roots of the teeth. If a fever exists and no cause can be found for it, other than these pus pockets about the teeth, they should be attended to.

(3) There has been a good deal said, I think without any good reason, of late years, about dental diseases as a cause of mental and nervous disturbances: especially by an enthusiast in Buffalo who has maintained that pretty much all insanity is due to diseases of the teeth, particularly a third form of disease, *im-*

pacted or unerupted teeth behind the other teeth, whence they have never come down. An X-ray shows these in a good many people, and if we photograph enough of such people we find among them some who have nervous or mental disturbances. I do not think we have any good authority for believing that any diseases of the teeth, whether pyorrhea, caries, or impacted teeth, are connected with mental disease.

I think all this is important, because we often hear of people who have been urged to go to considerable expense and trouble in the hope of getting a new lease of life out of dental work, which will not give them any new lease of life, but only better teeth. It should be said that all the problems about the teeth which I have presented here are still new problems, and still open to discussion, but I think discussion is crystallizing pretty fast.

Emetin, which is the active principle of our old friend ipecac, is given subcutaneously for many diseases caused by amœbæ, especially dysentery; it is also effective in killing amœbæ in the mouth. We have an enormous number of amœbæ (an amœba is an animal, not a bacillus properly so called) in our mouths, but it is not yet proved that they do any harm. Some people think they do good as scavengers, serving us as the scavenger serves society. Emetin will kill these amœbæ, but it is yet to be proved that it does us any service by killing them. Emetin is a valuable drug for a good many purposes; but it is still a new drug

and has dangers because no one knows exactly its capacities for poisoning. It should never be used except under direction of a physician who knows all about its use and the particular brand used.

There are certain other questions about the teeth that concern general medicine. It has been believed that bad teeth are often the cause of dyspepsia. Ten years ago I often heard physicians say, "Of course he has dyspepsia; he has no teeth; how can he chew his food?" Now we almost never hear that. "Oh, yes, I can gum it," a toothless old man says to me every now and then, and they do gum it perfectly well. I think the time when teeth were thought to be so indispensable was the time when we thought that meat was indispensable in the diet of adults. Almost the only thing we need teeth for is meat, and if meat is seen to be, as it is now, an unimportant article of diet for adults, the question of chewing is not so important. Soft foods can be chewed without teeth. If children's jaws are so tender from bad teeth that they cannot chew, they will suffer, but I cannot say that I have ever seen a child with dyspepsia or indigestion or malnutrition because of bad teeth. I think the evidence goes to show that the sequence is the other way — they have bad teeth because they are not nourished.

I have yet to see that the teeth have any importance in relation to tuberculosis. The germs of tuberculosis have been found in teeth and in the pus pockets of alveolar abscesses, but that they have any important

relation to tuberculosis I do not think is as yet shown, and I do not think it is the opinion held by competent authorities. Please note before we leave this subject that I have spoken of the teeth wholly in relation to diseases outside the mouth. About dental disease and

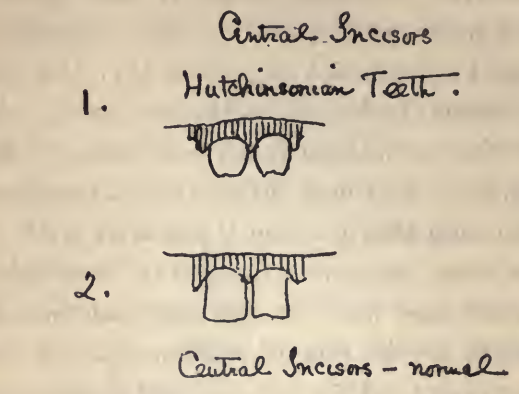


Fig 28. Diseased teeth and Normal teeth

its effects on the teeth themselves I am not competent to speak and make no attempt to speak. I am not undervaluing the care of the teeth for the teeth's sake and to avoid toothache.

Before I leave this subject I should speak of the so-called "Hutchinsonian" teeth, the teeth of congenital syphilis. There is no absolutely pathognomonic or absolutely certain form of syphilitic teeth, but the teeth

which are especially concerned in this question of congenital syphilis are the two central upper incisors. These two teeth normally are at least as broad at the cutting edge as they are at the gum, sometimes a little broader. In contrast with that, in the teeth of congenital syphilitics these central incisors slant in so that they are narrower at the cutting edge than at the gum. They also are often notched on the edge, but the notch is not the essential thing. The essential thing is the lateral slanting in toward the cutting edge. Do not suspect any one because you find a notch in the edge of the teeth. Do not suspect any one because *some* tooth narrows laterally toward its cutting edge. But we may suspect syphilis if the upper central incisors slant in from the sides. See Fig. 28. Jonathan Hutchinson described these teeth many years ago, and they are called "Hutchinsonian" on account of him.

It is not always necessary to have anything done for decayed teeth in order to improve patients' general health. That is a question for careful study and not for a decision at first hand. I have seen a great number of perfectly healthy persons who have had bad teeth all their lives.

We are sometimes asked: Should not all tuberculosis patients have their teeth attended to at the outset of treatment? I do not think so. It should depend on how bad their teeth are and what symptoms they have that might be attributed to their teeth.

I am talking wholly about health and not about

beauty. It is very hard to break down one of the most untrue statements ever made, that cleanliness is next to godliness. The poor who are dirty are at least as godly as the rich who are clean. Granted that to have perfect teeth a person must have them attended to whenever there is any disease in them, this is not for fear of nervousness, indigestion, insanity, or dyspepsia. Doubtless, if all teeth were perfectly taken care of for their own sake, other diseases — for example, joint troubles — would be less likely to come. But you might take care of a thousand persons' teeth to save one joint.

The *tongue* is an organ seldom diseased, but there are three important diseases which occasionally occur on the tongue, the possibility of which I think every one should know. A chronic ulcer or sore upon the tongue may be due to four causes: the important ones are cancer, tuberculosis, syphilis; the unimportant one is jagged teeth in the vicinity, which keep up an irritation. The diagnosis between those three important diseases is very difficult. I myself am quite unable to make it, and I say that in order to impress the fact that any person who has a chronic sore on the tongue should have the most expert opinion before it can be known whether it is curable by anti-syphilitic treatment, whether it is due to a tuberculous process, or whether it is a cancer that must be operated on. Diagnosis is hard, but it can be and should be made, as it is of great importance to the patient.

The throat. I have discussed tonsillitis in connection

with the respiratory diseases. *Syphilis of the throat* should be mentioned. The throat is one of the commoner places, next to the skin, for syphilis to appear. It makes a chronic ulceration, extraordinarily free from pain — not altogether free, but wonderfully near to being free considering how extensive the ulceration is. This ulceration is usually on the tonsil or on the soft palate. Not infrequently it perforates the soft palate and leaves a hole. In other cases it makes the palate stick to the back of the throat so that discharges from the nose can hardly go down. Syphilis occasions trouble in breathing in the larynx lower down, which I have already mentioned in connection with the respiratory diseases.

The treatment is the same as the treatment of syphilis anywhere else. The outlook also is good. Processes in the throat which look hopeless, they are so large and angry, will disappear under proper treatment.

The esophagus or gullet is the next step down the intestinal tube. In the esophagus there are very few diseases, practically but two that we are likely to see — cancer and corrosive stricture. *Cancer* at the lower end of the esophagus, just where the esophagus joins the stomach, is a fairly common disease and manifests itself by shutting up that tube so that people cannot swallow, or can swallow only liquids. It is absolutely incurable, and all that can be done is to stretch this narrowing, or to make by an operation an opening into the stomach so that we can feed the person through the

abdominal wall. This may keep him alive for a year or two, but the disease goes on just the same. This is one of the places where cancer is most hopeless; so far as I know there is not a chance of cure. I want to warn laymen against the dangers of an instrument which is sometimes used in the diagnosis of this disease, the *esophagoscope*, an instrument for seeing, with a system of mirrors, directly into the lower end of the esophagus. In the hands of an expert it is valuable, in the hands of any one else very dangerous. I have known patients to die as the result of having this instrument unskilfully used for diagnostic purposes.

Corrosive stricture of the esophagus is due to acids or alkalis swallowed by mistake. The strong alkalis used in laundry work now and then get swallowed, and produce an inflammation in the esophagus, the scar of which closes the esophagus. These cases sometimes live for years with a gastric fistula (an opening through the abdomen into the stomach). One such case has gone on for twenty years and may go on for many more. Through the opening made by the surgeon they can be fed directly into the stomach without using the mouth or esophagus — a little inconvenient, but not much.

Spasmodic stricture of the gullet at its entrance to the stomach produces a stoppage of food without known cause, gradually increasing year by year until almost no food will go down. It begins usually in early adult life. It is cured by dilatation of the stricture with appropriate instruments.

The stomach is a region interesting to most persons because of their personal experiences with trouble there, and yet it is true that real organic disease of the stomach is rare. Stomach symptoms are almost universal. Stomach diseases are rare. There are practically only two diseases of the stomach, cancer and ulcer. The other diseases which manifest themselves by stomach symptoms will be discussed later.

I will deal first with *cancer of the stomach.* The history of this disease is one which I think we should all know somewhat in detail, because the diagnosis depends so much upon history. When the diagnosis depends largely upon the history, the layman and the social worker should know it. When it depends on physical examination, it is of course wholly the business of the physician. The following history is typical: A person over forty-five, who has had no previous stomach trouble, but really seems often to have been particularly immune to stomach trouble, begins suddenly to have dyspepsia, "dyspepsia" being here used as the general word for any kind of discomfort or pain in the region of the stomach. These people often use expressions like, "I could eat shingle nails up until last May." They are often "gastric athletes" as the Germans say, up to the time when the cancer attacks.

The symptoms of gastric cancer, then, begin suddenly in a person who has had no stomach trouble, and never stop. The distress and pain that he has come after food, and are often the cause of vomiting. He

emaciates rapidly. On that history in an elderly person most of us would strongly suspect gastric cancer, no matter what physical examination showed or did not show. Physical examination may show something. It may show a lump in the pit of the stomach; usually it does not. X-ray examination is of great value in diagnosis.

Gastric cancer usually kills in from one to three years. In a general way it may be said that it is incurable. I have not known in the Massachusetts General Hospital a cure; in the Mayo Clinic they think they have had some cures. Operation is performed for relief and perhaps with some hope of cure. Cancer is usually at the lower end of the stomach and blocks the outlet more or less completely, so that food stagnates in the stomach. The stomach becomes stretched, or "dilated," and food eaten twenty-four hours or even forty-eight hours before may be recognized in what comes up during vomiting. In health the stomach empties itself inside of eight hours.

The operation that is ordinarily done is the operation of gastroenterostomy.[1] We make a mouth or a connection between the stomach and the intestines, joining them so that the food goes straight from the middle of the stomach into the intestine and does not have to go out through the outlet of the stomach, now partially blocked by the cancer. The new opening

[1] The roots joined together in this word are *gastro*, stomach; *enter*, intestines; *stoma*, mouth.

works perfectly well, and if it were not for the cancer, would cure. But the cancer spreads and soon kills.

Peptic ulcer is a much more manageable affair than cancer, which is lucky because it is much more common. Here again the history is important, and I shall go into it in detail. Notice the striking contrasts with a cancer history. Peptic ulcer has usually been going on at least ten years when a doctor first hears of the case. The patients average about forty-two years old when one first sees them, but they have often had the disease since they were twenty. They have had it *intermittently, with long periods of perfect health* — no trouble whatever for weeks, months, or even years.

There is a series of attacks extending over a long period of years. Each attack is essentially as follows: When the stomach begins to be empty, two, three, or four hours after a meal, the patient begins to be conscious of distress, which varies all the way from simple hunger, through discomfort, to active pain. The most characteristic thing about this distress is not its nature as a sensation, but (*a*) the fact that it comes when the stomach is empty, and (*b*) the manner of its relief. It is relieved by food. The taking of food after a little while removes the distress, and the patient is comfortable again until three or four hours later, when the stomach is again empty. It is also relieved by any alkali, the most familiar being sodium bicarbonate, or cooking soda; also by vomiting, or by washing the stomach out with the stomach tube. There are then

four methods of relief: (1) food, (2) alkali, (3) vomiting, (4) washing the stomach.

The appetite is splendid and the tongue is clean. These symptoms last for a variable period, and then, as I have said, disappear and recur later.

This chain of symptoms does not *prove* ulcer, it only suggests it. They may be due simply to hyperacidity — too much acid — without ulcer, and that distinction can only be made by the X-ray. The typical history, plus X-ray findings, means ulcer. The typical history, minus X-ray findings, may be only hyperacidity.

The more we talk with chronic dyspeptics, the more we find their symptoms are those of ulcer or of hyperacidity. This is *the* common chronic dyspepsia. If we do not cross-question them, they will simply say that they have pain after food; which is true, but only half true. Their pain is at a considerable distance after food *and is relieved by food*, so that the patient often carries crackers in his pocket. In cancer the pain comes immediately after food, and is made worse by putting food into the stomach.

The ulcer is called *peptic* because it seems to be the result of a self-digestion of an unsound area of the stomach. I think it is worth while to stop a moment and notice what an extraordinary thing it is that the stomach does not always digest itself. Take the stomach of an animal and put it into the gastric juice of that animal, and it will be digested in a short time. We explain our stomach's ordinary freedom from self-diges-

tion by saying that the stomach is alive. As long as it is alive its own gastric juice cannot digest it, but we do not know what that means. It protects itself in some way. When *local death* occurs anywhere in the stomach (perhaps from streptococcus infection), self-digestion begins, and a round hole is eaten out of the stomach by its own juice, until, if the corrosion goes on long enough, it may actually perforate into the peritoneal cavity producing virulent peritonitis. This is an occasional cause of sudden death, death within a day or two.

The ulcer usually comes within an inch or two above or below the pylorus (the ring separating the stomach from the intestine). It is essentially the same disease, whether in the last inch of the stomach (gastric ulcer) or in the first inch of the duodenum (duodenal ulcer). In about one fifth of the cases blood in large amounts is vomited, or passed by the bowel. This is bleeding from the floor of the ulcer.

The treatment of this trouble is either medical or surgical, but every one agrees now, I think, that medical treatment should be tried first, and surgical treatment resorted to if medical fails. Medical treatment means diet, rest, and alkalis. The essentials of the diet, which I do not mean to go into in detail, are the cutting out of meat and fish. At the beginning the patient is fed substantially on milk and some cereal such as crackers; later one article after another is added.

Sometimes the ulcer will not heal in spite of months

of rest and diet and alkali. Alkali is given for the relief of pain; it does not cure the disease, but is a great comfort. There is no limit to the amount of alkali a patient can safely take. He can take barrels without doing any harm, but of course it is a symptomatic or palliative treatment, whereas persistent diet and rest do give us hope of healing the ulcer.

If now the ulcer will not heal, the surgeon tries to cut out the ulcer, and in any case does gastroenterostomy or some more extensive operation. That is sometimes curative, and almost always relieves. The gastric contents do not then any longer go over the ulcer. This is often a most insignificant little ulcer, but it does not heal because the corroding acid contents of the stomach bathe it three times a day. After operation it may heal.

Question and Answer

Q. How is the X-ray examination made?

A. The ordinary bismuth salt, subnitrate of bismuth, is opaque to X-rays. The patient swallows a glass of gruel which contains from one to four ounces of bismuth. It does not taste. The bismuth coats the inside of the stomach and intestine, and when the X-ray is turned on we see the stomach and intestine outlined by bismuth. The surface of the ulcer is irritable and will not bear the bismuth. Hence one finds in the X-ray plate that the continuous stomach outline becomes broken at some point, the break being due to the absence of bismuth on the ulcer surface. All this knowledge came from the work of Dr. Walter B. Cannon, who first used bismuth X-ray in his diagnostic work upon cats.

Gastritis, or inflammation of the stomach, used to be a common diagnosis. To-day we can be pretty sure when we hear it that the doctor who made it is not up to date. It is a disease which I have not seen in the last two years' work at the Massachusetts General Hospital. When I first worked there, twenty years ago, we made the diagnosis of gastritis many times a day. Gastritis is to-day a term practically confined to alcoholics. It is an occasional result of alcoholism. Not all alcoholics get gastritis, but some of them do.

Gastritis is recognized by the presence of an enormous mass of mucus in the contents issuing out of the stomach through the tube. This occurs chiefly in alcoholics. It is a rare disease and not important.

At this point I wish to say something about the use of *the stomach tube*. Any layman may have to advise, encourage, support, or comfort some one who must have the tube used on him. The stomach tube is a rather firm red rubber tube about as thick as the finger. It is passed straight down from the mouth to the stomach. We have a mark upon the stomach tube which comes opposite the patient's front teeth when the end of the tube has reached the stomach. In people who have no serious disease of the heart, lungs, or throat, and are conscious, it is practically harmless to pass it, and in every great hospital it is passed many times a day with good result. With serious heart or lung disease the amount of coughing or retching produced by the tube is a strain to which it may not be

safe to put the patient. In unconscious patients the natural reflex closure of the respiratory tube does not always take place, and so the tube itself or other substances may be pushed into the lungs and so may start pneumonia. Whenever a person is conscious the reflexes take care of that. The epiglottis closes over the mouth of the wind pipe and keeps all harmful substances out.

We should warn patients that they will feel acutely nauseated for the period of the tube's passage, but that, much worse than that, they will feel as if they could not breathe — and the crucial piece of information is that *they can* and must breathe. I can remember perfectly going through the same sensation when I took the tube, and saying to myself, as I have so often said to patients, "Breathe!" You have to shake yourself, or the patient, into breathing. Then things go easily. We extract the stomach contents by suction or we wash them out by siphonage.

In feeding people who resist feeding we ordinarily pass the tube through the nose, down the pharynx, to the stomach. This is, of course, uncomfortable. But I do not believe, as I said before, that there is ever any danger in it. People often wash their own stomachs out, or used to, just as they wash any other part of the body. Nowadays the stomach wash is not used much for treatment, so it is only once or twice that the patient has to swallow the tube. It is for these occasions that the above counsels have to be passed along.

There is not an organ in the body which may not cause stomach symptoms, and it is for that reason that stomach symptoms are so enormously common, although stomach disease is rare. Out of any hundred patients who, in answer to the doctor's "What troubles you?" would say, "My *stomach* troubles me," not over ten have any disease in the stomach, for cancer and ulcer are practically the only stomach diseases, and neither is common.

I should say that the *commonest cause of stomach complaints* is nervousness — psychoneurosis of all types, emotional dyspepsia. I do not suppose there is any one who has not experienced this. You are eating your dinner, and some bad news, or some exciting emotion comes in, and your digestion is interrupted. In people whose emotions are constantly on the stretch this may last for weeks, months, and years. It gets linked up very soon with one of those perversions of consciousness that I like to call a "dislocation of consciousness," whereby our minds become burdensomely aware of what we ought to be unconscious of. If our attention is called to the stomach, it may be hard to get our attention back into its place, which is on the ordinary and extraordinary affairs of everyday life outside us.

The effect of a dislocation of consciousness is to make the movements of the stomach hurt. It is for this reason that in the treatment of such things we use such apparently far-fetched methods as sea voyages

and change of work. We need to change the focus of attention.

More than that, we have to nourish the patient. The patient who has nervous dyspepsia will say that a given food — milk or potato or bread and butter — hurts him; he stops it; the stomach is ill-nourished and feels worse. He stops meat, and feels worse. He gives up milk. In this way one article of food after another is cut off until he is really pretty near starvation in this process. Laymen can often help the physician in starting, encouraging, or commanding patients to eat when they do not want to eat, when it seems to them that they cannot eat. For it is only by eating and so getting the stomach and the whole body better nourished, despite the pain of eating, that we can begin to overcome this train of symptoms. It is a vicious circle. We cannot eat (so we think), so we do not eat. Then we (including the stomach) get ill-nourished. Then we lose appetite and think we cannot eat, so we do not eat, etc., etc.

Every disease, pretty much, has that type of a vicious circle. We break in at some point in the circle: e.g. by changing the point of view, or by making the patient less conscious of his disease and so more willing to eat, or by forcing him to eat. There is nothing that needs to be said more often, to people with this type of trouble, than that *they must push through pain into freedom from pain*, and I often use with them the example of what happens to the muscles of an arm after a fracture.

When an arm has been broken it is put in a splint; while the bone knits the idle muscles waste away and the ligaments and tendons stiffen. The result is that when the person is cured of the broken bone he must get over the results of the treatment of the broken bone, by forcing himself to use the arm *in spite of pain* — pushing through pain to freedom. It is wonderful how many types of human trouble this applies to.

Dyspepsia is a symptom of disease; a part, never the whole. It merely means that one has trouble with his digestion, the cause of which one does not yet know. Dyspepsia may be due to disease in any organ of the body, starting at the top.

(1) Begin with *diseases of the brain* as causes of dyspepsia. Nervous dyspepsia or better, emotional dyspepsia, is one of the commonest of these types. Emotional dyspepsia is ordinarily an interference with the completeness of the process of digestion. Emotion stops it in the middle, or prevents it from being carried on as it should be. The investigation of the stomach in such cases either shows nothing or shows stagnation of food, but no disease. Indeed, investigation of the stomach, in the vast majority of cases in which we investigate with the tube and the X-ray, shows nothing. That is part of our evidence that the trouble is in some other organ. The dyspepsia itself may not differ at all so far as the particular complaints are concerned, in these functional cases of troubles outside the stomach, from the stomach diseases themselves.

The feelings within the stomach itself are not characteristic. One relies on the results of general physical examination, tube examination, and X-ray examination. Emotional dyspepsias are furthermore generally to be recognized by the fact that definite emotional troubles aggravate them. The removal of these troubles makes the patient better.

There is almost always association with constipation. Emotional dyspepsia with constipation may lead to great weakness and emaciation, through a person's cutting off one article of food after another because he associates it with stomach distress, so that in the end a purely nervous or emotional dyspepsia may be a serious thing and may cause death, through the refusal of food and the malnutrition that results. This extreme type is called *anorexia nervosa*.

The layman's part in the care of any one, said by his physician to have nervous dyspepsia, is to help the physician in encouraging that person to disregard it, to go ahead in spite of it, to eat even when it hurts, to get his mind if possible occupied with other things. There are some people who cannot digest if they eat alone. Their minds get on themselves, and make trouble, as minds always do make trouble when they interfere with that which is meant to go on unconsciously.

(2) Besides "nervousness," any *organic disease of the brain* may cause dyspepsia and vomiting — for instance, brain tumor and meningitis. Patients also

vomit in "softening of the brain," that is, syphilitic disease of the brain. They vomit in cerebral arteriosclerosis, and there are often other stomach symptoms too with that last disease.

(3) The *lungs* lead to stomach trouble, most often when they are tuberculous; indeed, the stomach troubles of tuberculosis may be the only thing that the patient complains of. Every year we have cases sent into our hospital wards for supposed stomach disease, and when they are studied it is shown that the whole trouble is in the lungs, while the stomach is perfectly sound. In those cases we direct our whole attention to the lungs, and the stomach straightens itself out. I remember well one of the first visits that I paid to the Rutland Sanatorium, at a time when I had not learned much about the treatment which is now carried on in all sanatoria. Dr. Vincent Bowditch was then in charge. I remember questioning him somewhat in this way: —

"What do you do for night sweats? Do you use agaricin, atropin, cold sage tea, or what?"

"We do not use any drugs," he said. "We put the patients outdoors and they soon stop sweating as fever abates."

"Well, do you believe in the antipyretic drugs to check fever?"

"No," he said, "we put the patients to bed, and put them outdoors, and the fever stops."

"But," said I, "you surely must use some expectorants for cough?"

"No, really," Dr. Bowditch replied; "after we put them out of doors for a little while they cease to cough."

"Still, you must have something to give them an appetite. Do you use nux, ipecac, capsicum, gentian?"

The same answer.

And so with the stomach troubles. They all vanish when the patient begins to get on the right track, and they won't any of them vanish until he does. One can hardly believe this until he has seen it. We absolutely disregard these stomach symptoms and treat the patient wholly for his lungs; then the stomach straightens itself out.

(4) *Diseases of the heart*, when the circulation through the stomach as well as through the other organs is delayed by stagnation of the blood, produce dyspepsia, vomiting, and this may be almost the only thing the patients complain of. They may have only a mild type of dyspepsia, but practically all of them have some trouble with their stomachs. Again, what we do is to treat the heart, and when we can get the heart to pump properly, when we can get the congestion out of the vessels in the stomach, it does its proper work.

(5) *Diseases of the liver*, and especially alcoholic cirrhosis, produce congestion of the stomach because the blood that passes from the stomach goes to the liver, is blocked there by the diseased tissue, and so backs up in the stomach and engorges it. We often have hemorrhage from the stomach in alcoholic cirrhosis, so that a great many of these cirrhotic patients are falsely

supposed to have a bleeding ulcer. When a patient who has been previously well suddenly vomits blood in large amount, the most probable solution is that he has alcoholic cirrhosis of the liver, with backing up of blood in the stomach and finally hemorrhage.

(6) *Diseases of the intestine*, especially obstruction, so that the intestinal contents do not pass on, disturb the stomach and lead to all the familiar symptoms of dyspepsia, but especially to persistent vomiting.

(7) Many *chronic diseases of the kidneys* produce dyspepsia, and are often overlooked. That is one of the things that I think even social workers ought to be on the lookout for. Pretty nearly every week we see in the paper that the Honorable Mr. So-and-So, while making an after-dinner speech, was seized with "acute stomach trouble," was taken to his hotel, and soon died. That is never true. Nobody was ever killed by an attack of acute stomach trouble. There was long standing organic disease in some other organ of his body. The sick organ is probably his heart, the next chance is his kidneys, and the third chance his brain. Excitement or fatigue upset the balance or drawn battle between nature and the disease. Then came the stomach symptoms. Nobody is ever in danger from acute stomach troubles, unless he has swallowed corrosive sublimate or violent irritant poison.

(8) *Industrial diseases* produce stomach trouble. The commonest and only well-known industrial disease, lead poisoning, is the most likely of all to pro-

duce stomach symptoms, but commoner than any definite industrial disease is *industrial fatigue* as a cause of dyspepsia — hard work, overwork, and worry. The exhaustion from excessive labor, or, more often, from the mental or physical conditions under which labor is done, often makes the stomach rebel.

(9) Many *diseases of the blood*, including all the anemias, show themselves chiefly as a rule by stomach trouble and general weakness.

I think I have given a list sufficient to indicate that the stomach manifests troubles in all the other organs. Dyspepsia, therefore, is not characteristic of any disease in the stomach itself.

CHAPTER V

DIET — CONSTIPATION

Diet

ALMOST nothing is known about diet. There are numerous weighty books on the subject which are useful for pressing leaves, but not for much that they contain. All that is really known about diet can be contained in a very small book, and one of the most encouraging signs of the times is that books on diet are getting smaller. The man who probably knows as much about it as anybody in the United States is Dr. Graham Lusk. He has published a book of fifty-one pages,[1] which contains almost all the known wisdom on the subject — a most refreshing contrast to the old wives' tales that are so numerous and so dull in long books on this subject. Everything in it is true, and there is nothing in it that is not true. I do not know of any other book about diet of which that can be said.

Diet is a very individual matter. We do not quite realize often how much meaning there is in the phrase, "It is a matter of taste" — *taste* in the literal sense. It is owing to that, I think, that so many false ideas have got abroad. I had an uncle who was a physician and who had very strong convictions on the subject of jelly. The result was that if anybody who was sick had been

[1] Graham Lusk, M.D.: *The Fundamental Basis of Nutrition.*

taking any gelatine within any reasonable time, that was apt to be blamed as the cause of the trouble. There was another very well-known Boston physician some years ago who had strong beliefs about oranges. If you came to him about your headache, or a pain in your knee, he would say: —

"Have you been eating oranges lately?"

If the patient denied this, he would say, "When *did* you eat any oranges?"

"Last summer."

"Ah! That's it! They are still poisoning you."

It is very hard for physicians not to inflict their private preferences on their patients, and I think this accounts for the large size of the older books on diet.

We divide foods into three classes: *proteids*, *carbohydrates*, and *fats*. The simple way to remember them is to memorize the proteids and the fats, which are very few, and then to assume that everything else is carbohydrate.

Proteids are *meat, fish, milk, and eggs*. There is some proteid in cheese and in vegetables, but that does not need to be considered in a rough sketch like this.[1]

Fats include *butter*, *cream*, *some cheeses*, *the fat in meat*, *the oils*, *such as olive oil and cotton-seed oil* (which is often used, although we do not always recognize it as such). Of course *bacon* is the fat of meat, although we

[1] Rice contains 2.8 per cent of proteid; beans, 9.4 per cent; Dutch cheese, 37.1 per cent; cream cheese, 25.9 per cent.

do not always think of it just that way, and the *yolk of egg* is practically pure fat. There is very little fat in Dutch cheese. It is the soft ones that have fat.

Leaving out the few foods which I have listed, almost everything else is *carbohydrate*, and that reduces the necessities of memory to a pretty small number.

Now it seems to be true that people, who have been brought up as we have, need a "balanced dietary"; that is, a certain allowance of each of the three kinds of food. Many Esquimaux are healthy, and they never have a balanced dietary. Many Hindus are healthy, and they never have a balanced dietary. The South Italians are healthy, though they rarely eat meat. But they are used to it, and we are not. We have been pampered for many generations. The Esquimaux never have any carbohydrates, and the Hindus have scarcely anything else, but they have got used to it. I think the best one can say for us is, that after we have been used to it for so many generations as we have, it does not pay to throw out any one of the three main classes of food. Therefore, in thinking of our diet or of that of our friends, we should try to arrange that the three classes of foods are represented, and, in a general way, that no one of them is tremendously in excess of the average eaten by those who can get what they want. I believe that adults who have been pampered as we have, had better have proteid in some form at least once a day, if not more. If they cannot get meat, they had better have eggs or milk.

The more we study the diet of different people, the more cautious we shall be in laying down the law about what people must eat. The Italian laborer can do more work in a day than most Americans can do in two, and yet he, as a rule, has little but carbohydrates in his diet, little fat, and almost no proteids; but then he is used to it.

Very little is known about the so-called "indigestible foods." Indigestible food represents the idiosyncrasies of the individual, not wholly but mostly. What is indigestible for one person is often easily digested by another.

Cherries and milk are supposed to be a fatal mixture, but we find that even the timid will take the cherries and a little later on will have tea with cream. The same superstition exists about shellfish, oysters, or soft crabs with ice-cream, or oysters and milk. I think there I have some idea how the notion started. I fancy it arose in relation to taste. If you eat oysters and then drink milk, the milk tastes queer. I suppose that is the way that the idea of their incompatibility arose. The person who is said to be ill as the result of eating one of these mixtures is really ill from something else. The trouble is usually with his heart or his kidneys or his brain, or his appendix. A person has almost always eaten *something* before he is taken ill in the night, and then that something is blamed. I am speaking now of mixtures of substances supposed to be separately harmless. I am quite sure there is no such

thing as an indigestible mixture of two digestible things.

The *chefs* always have strong ideas about this. They warn us against the mixture of milk and acid fruit, for instance, and tell us that the acid of the fruit may curdle the milk, which is true, but as soon as the milk reaches the stomach it curdles anyway. There is, however, something to be said here in relation to different *kinds of curds*. If one takes a large quantity of milk as fast as he can drink it down, it will sometimes form a particularly tough curd in the stomach which is quite a job for the stomach to break up. It forms a very different curd if we sip the same amount of milk with a bite of cracker between the sips. It then forms a loose curd on which the stomach does not have to do any hard mechanical work.

Any one can take milk. If a person tells me, "I cannot take milk," I always say, "You can if you will take it in a certain way." It is a question usually of flavoring it aright or of taking it like soup, with a spoon, with a bite of some carbohydrate substance, cracker or bread, between the sips. I do not think everybody must take milk, but I think everybody can.

Some foods *take a long time to digest* because they contain so much fat or so much waste, what is called "cellulose," the stalky parts of vegetables. Foods which contain a great deal of cellulose are apt to be slow in leaving the stomach. Again, fats are slow in leaving the stomach, and that leads many people to think that they are indigestible. If we have taken a

great deal of fat, we may be made aware of its presence in the stomach for some time after we have taken it, but that means merely that we have not yet digested it. "Rich foods" are full of fat, and hence are slow of digestion but very nourishing. If an empty stomach is needed in the prosecution of business for an actor, a speaker, or a singer, it is better to put in, not fat, but something that quickly leaves the stomach, and that is carbohydrates and water. Carbohydrates and water leave the stomach quickest. The actor who is going to perform in the evening has tea and toast at about five o'clock; then his stomach is empty at the time he goes to work, and yet he has had some food and his tissues are not then calling for more. After he is all through his work he has a full meal.

Fats leave the stomach slowest, carbohydrates leave the stomach quickest, proteids are intermediate. Almost everything known on this subject is the work of Dr. Walter B. Cannon, of the Harvard Medical School, who watched with the X-ray the progress of foods mixed with bismuth; but one can confirm it very easily by one's own experience. A good many foods are cut out of the diet of invalids because they are said to be "indigestible," but in reality only because they require a good deal of chewing. A person fighting typhoid fever should not have any extra muscular work put on him, such as walking, talking, chewing. To-day this is about the only limitation we put on the foods of febrile patients. It used to be supposed that fever

patients could not take meat; they should not take it in the ordinary form because it is too much work to chew it, but if we chop it up fine they will generally take care of it perfectly well. All our typhoid patients at the Massachusetts General Hospital are now allowed meat during the worst periods of the disease.

We do not need to weigh out our diet. *We need to eat enough so as to feel well and to weigh what we ought to weigh.* There is no other satisfactory guide. A person can find out quite easily what at his height should be his weight. If he weighs more than this, he ought to eat less; if he weighs less, he ought to eat more. That, of course, has to be a general statement. I think the Lord has definite ideas about some people who ought to be thin, and others who ought to be fat. Certainly there are people who can eat almost double the average diet and never gain an ounce, and there are other people who will get fat on a diet that would not keep a bird alive. But these extremes are merely exceptions to the rule, that one ought to weigh what a person of his height should weigh, and govern his diet accordingly.

The American people as a whole bolt their food without chewing it, and get along perfectly well nevertheless. They undoubtedly put an unnecessary burden on their stomachs, which is a stupid thing to do, though it usually has no consequences that we can detect. Now and then we get hold of some unfortunate individual who has dyspepsia and we find out that he bolts his food. We do not question his hundred and one

neighbors who also bolt their food without chewing it, and get along perfectly well. We must not exaggerate the value of chewing, but nevertheless it is a sensible thing to do. The teeth are meant to chew, and if we bolt our food the stomach may have a hard time doing the work of the teeth. The stomach is a soft, flabby organ, and it seems irrational not to give our teeth something to do. But Fletcherism is a fad already defunct.

For a long time there has been a superstition that we should not drink water with our meals, either on the ground that it is bad for the digestion, or because it is supposed to make us fat. If we do not drink any water with our meals, we cannot eat so much, and *therefore* we lose flesh. That is the origin of the idea, I suppose. But if we measure out a given amount of food and eat it with water at meals, and then later without water at meals, we find that we weigh just as much. The truth is that the vast majority are better for drinking with their meals. If there are individual idiosyncrasies it does not change the rule. The fallacy may have arisen from the fact that if we drink *enough* iced water with our meals, — a quart or two, — we may be able to cool down the stomach so that digestion does not go on so well.

There is another fallacy, that very cold water is bad for the digestion. There is nothing in it. I remember the grave and fatherly reproof of the waiter in England when I asked for iced water, "Oh, no, sir, very bad for

the digestion." But I had the iced water all the same Extreme heat or extreme cold both stimulate the circulation and digestion. It is the lukewarm things which we are advised to take which really retard digestion. Any digestion which is delicate may need stimulation, and the simplest stimulation is from heat or cold. I do not mean to say that if one does not like iced water he must drink it, but there is no reason why one should not take it.

The taste of food, as Professor Cannon, and before him Professor Pawlow, of Russia, has demonstrated, is not merely a "matter of taste," it is a matter of hydrochloric acid in the stomach. Eating a food that we like is followed by the secretion of gastric juice in the stomach. That is true whether one is a human being or a dog. Professor Pawlow established an opening in the stomach of a dog and was able to observe that when a dog chews, or even sees, across the room, a food which he likes, his stomach immediately begins to secrete gastric juice. The idea that if we really like a thing it must be bad for us, is just the opposite of true. Liking is the proof of HCL secretion which is important in digestion, though it is not the only thing needed.

I like to point out from time to time some of the things that amaze me most in the arrangements of the human body. Some of these in the stomach are as follows: When we eat carbohydrates the stomach secretes an *appropriate* juice, a gastric juice of different composition from that which it secretes if it finds proteids

coming down. This is a response, and a most intelligent response, to the particular demand that is made on the stomach. It is one of the numerous examples of choice or intelligent guidance carried on by parts of the body which are ordinarily thought of as unconscious and having no soul or choice of their own. To me it is a proof that the soul — i.e., choice — is present in every part of the body.

Question and Answer

Q. You spoke of the selective action of the stomach; does that mean that there is a chemical change in the juices according to the food taken?

A. Yes; just that. It seems to me a most extraordinary fact. So far as I know, it has nothing to do with the part that the stomach plays in the digestion of food. That is quite a different thing. The stomach does very little in the chemical digestion of food; its job is chiefly mechanical. It does a little on the proteids, very little on the carbohydrates and fats. It is mostly useful to store food, as a squirrel stores it in his cheek; it then pays it out to the intestine as the work of the intestine is done. The saliva does a little to change carbohydrates into the more digestible form, but not much. Despite Mr. Horace Fletcher, prolonged chewing has not come into any vogue and does not deserve to. The work that the stomach does the pancreatic juice does anyway.

I must not leave the subject of diet without speaking of the burning question of candy. When I was a child every one knew that candy was a sin, and of course children were allowed as little as possible. Today we know that it is one of the most valuable foods, and that the chief danger is that one overdoes it.

Candy or any other sweet is apt to take away an appetite for other foods. That is the harm that it does. After meals, after you have had other foods, there is no harm in it. But candy is not the only food in the world, and some people tend to treat it as if it were, just as some gentlemen tend to treat whiskey as if it were the only food in the world. Hence trouble arises.

I do not advise the layman, either for himself or for those whom he tries to help, to calculate out the calory value of foods, the food value of weighed portions, or to work out the mathematics of diet. There is no need of it. We can tell by rough estimates and measures whether a person is eating enough. It is important, of course, to know something of the kinds of food, for the reasons I have given. The precise amount will take care of itself in the vast majority of cases. When Dr. D. L. Edsall was appointed physician to the Massachusetts General Hospital, I asked him whether he thought diets ought to be weighed out by calories in the wards, because he probably knows more about diet and nutrition than any practising physician in this country. To my great satisfaction Dr. Edsall answered that he did not think there was any sense in calculating calory values in routine ward diets, because we could judge of patients' diet and nutrition in other and simpler ways.

Still, as it is an advantage to understand the words that medical people often use, I will go on to explain that the *calory value of food* is the *common denominator*

to which we can reduce foods when we want to compare their power to nourish and warm the body. A food's calory value is the amount of heat which the food would produce if burned. If we burn an ounce of sugar, it will cause a certain amount of heat; if we burn an ounce of olive oil, it will produce another and much larger amount of heat. The nutritive power of food is roughly parallel to the amount of heat it produces, and it is on that basis that the calory values of food are calculated. "Calory" and "caloric" are from the same word which means heat. Calory value is heat value. We say that the average individual needs about twenty-five hundred calories of food a day; that is, the amount of heat which the food he eats will produce.

How do we obtain that knowledge? Simply by finding out how much people do eat and taking that as the right (or average) standard. That is, the basis of nutrition at the present time, the standard of calory value worked out by Voit, of Germany, is nothing but an enormous compilation of what German laborers, students, etc., actually do eat. The presumption at the base of our standard is that people eat what they ought to eat in amount and kind, which I think is a pretty true assumption for most people.

Do most of us eat too much meat? Rarely in youth. We seem to have evidence that growing children need abundant meat. I do not think that the evidence is very good, but it seems to me on the whole better than nothing. But we also seem to have evidence

that people who are past middle life can easily overdo on meat, and had better eat very little; by very little, I mean one help once a day.

If we take a tablespoonful of olive oil we are getting more food than if we took a large potato, for instance, because oil is a food which produces so much heat. All the fats are tremendously concentrated foods. Among the carbohydrates food values are inversely proportional to the amount of cellulose; that is, to the amount of stalk. Lettuce, for instance, is a food practically without value — nice and pleasant to look at, and valuable so far as it has dressing (made with oil). But the dressing is the only thing that has any food value. Rice and beans are the carbohydrates that contain the largest amount of food in proportion to cost. Five cents' worth of either of those contains more nutrition than anything else that can be had for the same price.

There is vastly more nutrition in a cup of pea-soup than in a cup of beef-tea. There is no nutrition in beef-tea as ordinarily made. It has value as heat, as savory, and as stimulant, in the sense of stimulating the flow of gastric juice, and through its heat it brings blood to the surface of the stomach. But it is almost impossible to make it so that it has any nourishment. Beef-juice squeezed out of the meat has much nourishment in it. That is very different from beef-tea. Pea-soup contains a large amount of nutrition because peas are among the most nutritious things that we eat. The clear soups are useful chiefly as preparing the stomach

for real foods which are to come later. The stomach likes to get about that amount of warming.

What I have just said about the value of clear soups, chiefly as preparing the way for real food to come later, reminds me of what Woods Hutchinson says about the popular modern breakfast foods: that they are all right provided you eat your breakfast afterwards. That is pretty strong, because almost nobody eats them without cream and sugar, which are highly nourishing. But the cream and sugar make up the chief value in shredded wheat, maple flakes, etc. The "trimmings" are more valuable than the food.

Oatmeal is a very valuable food in itself, besides the sugar and cream that we ordinarily add. Woods Hutchinson was referring to the more modern breakfast foods, the various things that look nice and feel pleasant in the mouth, but which have not much nutrition. Oatmeal, rice, hominy, cracked wheat, rye, corn meal — all those are very nutritious.

The value of malted milk depends a good deal on how much milk we add to it. Most of the directions given for the use of malted milk say, "Add milk," "Add cream." Of itself it is mostly carbohydrate, and of rather small food value, but all right so far as it goes.

Professor Graham Lusk, whom I have already referred to, says that the pure-food laws of the United States ought to be so amended that on every package which is sold the food value is in some way indicated. The question of the purity of foods is comparatively

unimportant, but *the food value of foods in proportion to cost is important.* Professor Lusk says that a working man who buys a can of beans ought to know that he is getting many times the food for the same money as when he buys a can of tomatoes. Tomatoes are ninety-four per cent water; there is hardly any nutrition in them.[1]

If foods were labelled in this way it would be far more important than having them receive or not receive the seal of the United States in relation to their purity. Most of the adulterants which are mixed with foods are harmless. The coloring matters one can object to because they are a fake, but not because they are poisonous. The green which makes canned peas green is artificial, but it is not paris green. There are dreadful warnings, issued mostly by rival manufacturers, that such and such a honey or preserve is made of glucose, just as if glucose were not one of the most important foods — namely, grape sugar. The joke about the harmless alum in baking powders is an example of how capital is made in this way. The makers whose powder does not contain alum (quite harmless anyway) make a fearful fuss about the fact that it *does not*, and most of the time that this noise is being made, the howlers are actually putting alum into their own powder. The amount of copper sulphate put into foods does, so far as we know, no harm. It is the same with

[1] On this whole subject, see E. A. Locke's *Food Values*, Appleton & Co., 1911 — a brief and admirable book.

benzoate of soda and the other adulterations about which Dr. Wiley waged such a contest some time ago. There is no evidence that in the amounts used they do any harm.

This "purity" question has an importance in relation to fraud. The worst adulteration that I ever knew about, from the point of view of fraud, was used in 1898, when one of the Chicago packing-firms sold to the United States Army in Cuba a lot of veal loaf which, when investigated, was found to consist of corn meal with slight traces of veal here and there. Now corn meal is all right in itself, but it should not be sold for the price of veal loaf. That is the sort of basis there is in most of the talk about adulterated foods.

Some of the substances that people talk about as being put into food to adulterate it are so much more expensive than the food that a little thought will set us right in that matter: chalk in milk, for instance. The only thing one can adulterate milk with is water, because it is the only thing that is cheaper than milk.

Now as to distilled water: it is very poor stuff to drink. I have no reason to suppose it will ever do any harm, because it is too nasty. It is the only pure water, and the only water that no one will ever drink if he can help it. It is, in fact, the mineral impurities in ordinary water that make it good to the taste.

There are certain other essentials in food besides the three constituents which I have mentioned, but in ordinary life we usually get these substances, so that it is

chiefly when one is on shipboard or at the North Pole that the question of scurvy comes up. Of course in children we often have scurvy, because their food may be very one-sided (unlike the adult's). Scurvy occurs in those who do not have any fresh food, and occurs for the lack of certain substances which are not either carbohydrates, proteids, or fats.

These substances are necessary constituents of food; about them we know very little, and they do not concern us much, but it is well to know the name. What are called *vitamins* are the substances in our food *whereby we do not get beri-beri.* Beri-beri is a very common disease in Japan and the Philippines, where people eat rice. It practically never occurs in those who have an ordinary mixed diet, but we know now that when people live on rice which has been "polished," — that is, from which the outer layers have been taken off, — they get beri-beri. They are deprived of some substance which we know very little about, something which is not carbohydrate, proteid, or fat. When the polishings removed from rice are fed to animals with beri-beri, the beri-beri gets well. This unknown x in the outer layers of rice is called *vitamin.* Possibly it is the lack of this or of a similar substance in diet that produces scurvy and pellagra. In our part of the world, where every one takes a mixed diet, the question of the presence or absence of vitamins does not often arise.

Shall people rest after food? Seldom. Rest before food is much more important. When we have been working hard, either with mind or body, the blood gets out of our stomachs into our muscles and brains. It is needed there. When we rest, a more equal distribution through the body takes place, and the stomach is more fit to do its job. On the other hand, after meals I think it often turns out that people digest a little better by not keeping still. I do not mean that they should play baseball and run the bases. But gentle exercise after a meal often assists digestion.

We also have to consider foods more or less with relation to bowel activity — their relation to constipation. Foods tend to prevent constipation chiefly in proportion to their content of cellulose, in proportion to their content of undigested residue, which stimulates the intestine to push its contents along. It is for that reason that we take the so-called coarse bread, rye or whole wheat, such substances as figs, which have considerable residue, or such substances as agar-agar. Cellulose is always in vegetable foods. There is no cellulose in any other food. Carbohydrates that are not combined with much cellulose digest quickly. sugar leaves the stomach very rapidly, and pure starch. When carbohydrates contain much cellulose they leave the stomach more slowly, but even then more quickly than the proteids. Fats also tend to prevent constipation. Any one who has dealt with children knows that in constipated children we try to add fats to their food.

It is not quite so true of adults. Knowing what the "fats" are, we add them in the most palatable way.

Questions and Answers

Q. How early do you give solid food to children?

A. At about two years.

Q. When a person is very tired and the stomach is affected from that, would you let him indulge in eating?

A. Yes, in a reasonable period, half an hour or an hour after that. He had better eat unless the stomach is very actively misbehaving.

Q. Do you believe in eating when you have a headache?

A. I should not always stop eating. I think it depends on the cause and the intensity of the headache and the way the patient feels in other respects. If you have a really sharp pain in your head, or anywhere else, your stomach is not likely to do its work well while that pain lasts. On the other hand, most of us have seen mild headaches go off as soon as food is put into the stomach.

Q. What about foods that are "heating"?

A. There are no foods that are heating. No food produces fever. You cannot take a food in hot weather that will make you hotter. People always say, in summer you must not take heating foods. That does not mean anything. It is particularly easy to overeat in summer, and this may have some relation to that tradition about foods that heat you. In a cold climate when you are putting out more energy, you must have more food. The reason why fatty foods are often taken by Arctic explorers is that they want concentrated nutrition of small bulk. Oil and sugar are very concentrated foods.

Q. Are colds supposed to come sometimes from upset stomach?

A. They are supposed to, but they don't. Colds come from lack of sleep, from overwork, from depression of vital-

ity, and from exposure to infected patients. There are times when the body is so tired fighting an infection that the stomach is not fit to do much, and at such times, if we are convinced of that, we had better not eat. The doctor should judge. We used to say, "Stuff a cold and starve a fever." The trouble is that all bad colds are fevers. If the cold is a very short infection, you may accomplish something by starving yourself; but if it is going to last any time, you certainly must eat, and in all the long fevers we now order full diet.

Q. With high blood pressure why should we be careful as to diet?

A. There are certain foods that are believed to raise the blood pressure. I do not think the evidence is very good, but it is the prevailing theory that meat and meat extracts and meat soups tend to raise blood pressure. There is nothing that is especially important as to diet in high blood pressure except the cutting-out of meat and meat soups.

Q. Do you believe in very regular hours for meals?

A. I believe very much in the formation of habits of all kinds, habits of mind and body. I believe that our bodies go a good deal better in harness and in routine; therefore I believe in eating, working, and sleeping at regular times. Any physician who is called in the early morning hours, and eats something before he goes out, knows that the effect of this may be indigestion. The stomach often does not do a good job. It is not accustomed to it and it rebels. There is a great deal in the rhythm and regularity of everything we do, and I am sure that we get along better and easier by eating regularly. A good many people that I know do not eat any lunch. A few people that I know eat no breakfast. It is a question of idiosyncrasy. The main thing is to find out by experiment your own best way and then cling to it. There is no absolute law for us all.

Q. Is there any truth in the statement that a person who is well fed is less apt to suffer from fatigue?

A. Surely. A person cannot do his work unless he is well fed, but "well fed" means different things in different people, that is, my necessary rations are different from the next person's.

Q. Is there anything in the idea that we all need fruit and green vegetables?

A. Except in relation to constipation, I have never seen anybody who suffered from the lack of fruit. Of course, if you lack all fresh food, as sailors sometimes do, or Arctic explorers, you may get scurvy, but I have never known any one on an ordinary diet, on land, who suffered from lack of the salts present in especially large percentages in certain vegetables.

Q. What is the diet in rheumatism and kidney trouble?

A. In kidney trouble there is some definite knowledge. Many people with kidney trouble tend to have swelling of the body — dropsy — and any one who tends to have dropsy should not eat salt. Salt holds water in the body. Moreover, we know certain spices and condiments that irritate the kidney and we cut those out. I will come back to that when we speak of kidney trouble. There is no diet either good or bad for rheumatism. We used to talk of avoiding acids, because we formerly believed that rheumatism was due to too much acid (especially uric acid) in the body. I remember a dramatic professor of medicine who brought out a piece of blue litmus paper, which you know turns red when you put it into an acid. He dipped the blue in a rheumatic patient's sweat, showed the change to red, and said, "You see, the acid sweat of rheumatism!" Of course, if he had tried the sweat that was rolling down his own brow, the result would have been the same. There is nothing in the acid theory of rheumatism, and nothing in the diet based upon it.

Constipation

In adults constipation is usually a disease of the brain — in other words, a result of nervousness. It is rarely a disease of the intestine, and in the vast majority of cases nothing is found wrong with the intestine. In only a minority of cases it arises from wrong diet; it is generally due to wrong thoughts and emotions. Every time there is a stock-market panic the stock-brokers run to their doctors for constipation. Every time a person has any great emotional strain, fear, worry, etc., he is liable to be constipated. Women are more constipated than men, because their emotional life is more intense and more complex. We used to explain it by the fact that they were more sedentary, but that cannot be the fact.

The fundamental cure of constipation is difficult, because there is nothing so tough as a mental habit. It is one of the hardest of all things to change, — much harder than a physical habit usually, — but it can be overcome, and I have yet to see a single case of constipation that cannot be cured by mental means alone. We often do not try to cure the trouble that way because it takes too much time, but it can be done.

Dr. Cannon, whom I have quoted so frequently because he is the source of almost all the modern knowledge of the stomach and the intestine, made some very important observations on this subject. When working on a cat, and watching with X-ray the movements

of its intestine rendered visible by giving the cat bismuth, a dog barked near the laboratory one day, and to his great astonishment he found that the cat's fear manifested itself in immobility of the intestines. He could not continue his experiment for some hours, because the cat's intestine had stopped work altogether. The rhythmic movements in the intestine had ceased because of the psychic inhibition — fear. Most human beings are more highly organized than most cats, and emotional disturbance which will affect a cat's intestine will affect a human intestine still more. Emotional habits get into the intestine and stick there very firmly.

Next to emotion as a cause of constipation, the most important thing is bad habits; that is, lack of regularity. We are creatures of habit to a degree that we do not ordinarily realize. I think one of the most striking cases of this is what happens to us on board ship, if the question of sea-sickness does not come up. In the middle of the morning the steward brings around something to eat. We have just finished breakfast, and we say, "No, certainly not." The second day we take what he brings — nothing else to do. But about the sixth day, if the steward does not come on the dot, we are much annoyed. Within a week the stomach has absolutely changed its habits. It feels insulted if the food does not turn up. That shows how quickly a harmless habit can be formed. In the same way a wrong habit can be formed very quickly and may be very difficult to break. People should have an abso-

lutely cast-iron rule about the time of day when their bowels move. It is the experience of hundreds of human beings that if they are suddenly called away in the morning before having their regular movement, they cannot again at any other time that day have a movement. That is one of the numerous examples of the force of habit. A working woman of my acquaintance found that it was more convenient to have her bowels move in the evening, and so trained her bowels in that way. It can be perfectly well arranged at any time of day, the whole point being that it should be the *same* time of day.

Any process that ought to go on unconsciously can be hampered by keeping the mind on it; this is also true of movements of the intestine. People have difficulty who get worried over the movements and are trying particularly hard. Many men get over this difficulty by smoking; it turns their thoughts in other directions. Other people use reading for the same purpose. The main thing is to prevent the mind doing harm in interfering in a direction where it does not belong. The whole process should be almost instinctive and automatic once the habit is formed.

Medicines used for constipation are very many and most of them very harmless. One should distinguish (and make others distinguish) between "laxatives" and "purgatives." A laxative is a medicine of mild action which can be taken over a long period without any harm. A purgative is a medicine of relatively

violent action, which empties the bowel out instead of simply moving its contents along a little faster. Purgatives are never to be used steadily. They have their place like morphine, as a rare occasional drug.

Laxatives often used are cascara, licorice powder, rhubarb, senna, phenolphthalin, agar agar, and the aloin, strychnia, and belladonna pills, ordinarily known both to physicians and patients as an "A. S. & B." These are the commonest mild laxatives. They are all things that people have taken without any special harm that we can see, for years and years, but they often lose their power.

The mineral oil so much used now is usually called "Russian Oil," but is simply liquid petroleum in an available and not very disagreeable form; it is a useful laxative.

Purgatives are such medicines as magnesium sulphate, the ordinary "salts" (Jewish patients call them "bittersaltz" — a good thing to know in talking with such patients), and the compound cathartic pill for which surgeons have a special fondness for their patients; mercury in the form of calomel or blue pill, and jalap. There is only one purgative that can be given to an unconscious patient, and that is croton oil, a drop or two of which on the tongue in an unconscious patient will sometimes produce purgation.

Of the use of laxatives this is to be said: a person who uses laxatives never gets rid of constipation; his bowels never get into order of themselves. On the

other hand, there are a good many people who can take laxatives for years without having to increase the dose, without the medicines losing their effect, and without any harm that we can see. In most of those people I believe the drug acts through suggestion, not on the bowel but on the brain; but it is hard to prove that. People come to a doctor sometimes for constipation who are getting on perfectly with some laxative, but are scared of its effects and have to be reassured that, so long as it works, and they do not have to increase the dose, there is no reason why they should not take it for forty or fifty years more.

The effects of constipation vary enormously. In certain people there are no effects. People may go without a bowel movement for weeks without any ill effects. It is hard to believe, but it is true. On the other hand, there are many more people who, if they skip a single day, feel headache and dull, dragging tire. I do not know how to explain these differences. A good many serious diseases or symptoms are attributed, quite falsely, I think, to constipation. I do not think there is any reason to suppose that it has any serious effect of any kind. Quite annoying hemorrhoids often accompany constipation and are seldom relieved until that is relieved.

CHAPTER VI

DISEASES OF THE LIVER AND INTESTINE

1. Diseases of the Liver

THE *liver* is rarely diseased. Patients tell you a great deal about their livers, and appear to have a great deal of knowledge about them, but physicians know very little about them, and in fact the liver is seldom diseased. People are always telling us that they have a "torpid liver," and I used to be quite eager to know what that was, and have them tell me what that was, but I have still to remain ignorant about it. Or people tell us that they are "bilious," which again they refer to their livers; when we dig out what they mean it has never anything to do with the liver. So far as I know, "biliousness" means constipation, and "torpid liver" means the same. These are terms known only to patients. One is apt to be told, "Oh, yes, I have to take such a drug for my liver"; or, "This drug works very well on my liver." But there are no such drugs. Calomel, for instance, is generally supposed to work upon the liver, but has no such effect whatever.

Two important diseases in or near the liver are *gall-stones* and *cirrhosis*. *Gall-stones* are common, but they are rarely formed in the liver itself, and are therefore no contradiction to what I have just said. Gall-stones are actual stones, and constitute one of many examples

of the curious habit of the body to form stones in the wrong place. The body forms stones in our skeleton; that is forming stones in the right place. But it also forms stones in a great many places where they do harm. So far as we know, it is an effort on the part of nature to do good; but sometimes it is a mistaken effort. How wonderful are the things that nature does, but also how wrong-headed every now and then! This process of building stones in the body may save our lives. There is a beautiful example of this use in diseases of the lungs. Probably more than half of us have at some time had tuberculosis in our lungs and have got over it altogether. When it heals it is often because the focus of live bacilli is actually walled in by a stone, so that when the lung is cut after death the knife rasps on this stone. But nature does a great deal of harm by forming stones in the gall-bladder.

Stones in the gall-bladder are the end result of inflammation in the gall-bladder, just as in the lung they are the end result of tuberculous inflammation in the lung; but in the gall-bladder they do no good, so far as we know, and certainly do harm. They may be as big as a pin-head or as big as a hen's egg, and there are usually many of them of the size of a pea or larger in the gall-bladder when there are any at all. The gall-bladder is about the size of an ordinary watch-pocket, and as long as the gall-stones stay in there they do no harm. A considerable number of all the bodies ex-

amined at autopsy show gall-stones in people who never had a symptom from them. It is only when they try to get out of the gall-bladder that they make trouble. The gall-bladder has a tube leading from it,

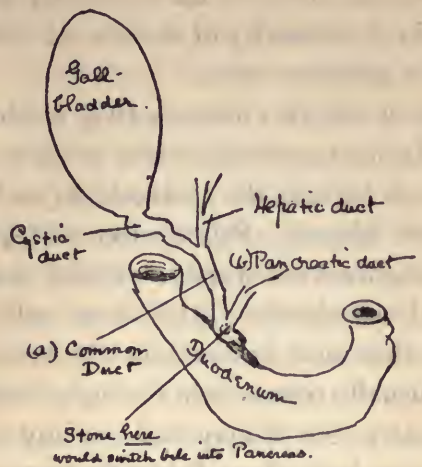


Fig 29. Diagram to show connection of gall bladder & pancreas to the intestine.

its own duct, which is joined by another duct coming down from the liver, and these two unite to form a common duct which leads to the duodenum; but just before it reaches the duodenum this common duct joins another duct coming from the pancreas.

Bile comes down from the liver, goes up into the gall-bladder, and is stored there, runs down the common duct to the duodenum, is mixed with the food,

and assists in a mild way with the digestion. We can get along fairly well without it. Stones, so long as they remain in the gall-bladder, usually do no harm; but every now and then they get stuck in the cystic or the common duct, and then we have trouble, which expresses itself in the majority of cases in what is called *biliary colic*, or *gall-stone colic*.

This is one of the two diseases that I think social workers and laymen generally ought to know the history of in detail, because the diagnosis depends almost entirely on the history. Peptic ulcer and gall-stone disease are diagnoses often made without much help from physical examination. Gall-stone colic is the severest pain that most individuals who have it have ever had. It usually comes on in the night, waking the person from sleep, but it may come at any time. Of all pains that we hear about it is most apt to require morphine, so that in taking the history of such a patient we always ask, "Have you had morphine given you for this abdominal pain?" and if one finds that morphine has been given, that is a certain amount of evidence that the pain is due to gall-stones. Morphine is a blessing for this disease, for it will often stop an attack, and after an attack a person may not suffer again for weeks, months, or even years. The pain is usually at the pit of the stomach and not over the liver, which is, of course, to the right of that point. From there pain shoots to the back and to the right shoulder and shoulder-blade. It lasts from an hour to eight or ten hours.

Its average duration we cannot tell very well, because it is usually checked by morphine; without that it might go on longer, perhaps, but not more than a few days. When it stops the patient is all right except for the exhaustion of the pain. It is apt to be accompanied or followed by chill, fever, jaundice, and vomiting.

Now, for contrast, we may profitably compare this with the pain of peptic ulcer. The pain of peptic ulcer is a pain which comes when the stomach is empty, three times a day, relieved by food, rarely very sharp, a pain that does not need morphine, that is not accompanied by fever or chill, that usually does not lead to vomiting. On the other hand, the gall-bladder pain is not a regular daily occurrence, but a single attack, coming usually at night, with no relation to food, very intense, needing morphine for its relief, radiating to the back and the right shoulder, and often accompanied by fever, chill, and vomiting.

Relief from morphine probably results because the morphine relaxes everything in the body, and with that relaxes the grip of the duct upon the stone so that the stone can slide back into the gall-bladder. If morphine is not given, the stone may pass down into the duodenum or back into the gall-bladder. People writhe with pain from the unconscious effort to get their bodies into some queer position, and so to ease themselves or perhaps to shake the stone back into the gall-bladder. They find that they are liable to get into a position where something lets up. Biliary colic

is a pain of which people often say that it "doubles them up," or that they writhe, or that "you can hear them shout for two blocks." It is never fatal, not in itself dangerous, only agonizing. Operation is done because the stone may lead to more serious results.

According to where the stone is placed we do or do not have jaundice. Jaundice is a yellow staining of the eye and skin by bile retained in the blood because it has not passed down into the duodenum; it is absorbed into the blood and thence deposits itself in the eyes and in the skin, and finally in the urine, making that dark. If the stone is in the cystic duct (see Fig. 29), the duct leading to the gall-bladder, the bile passes straight down into the intestine and there is no jaundice. But if the stone is in the common duct or the hepatic duct, it interferes with the passage of bile and we have jaundice. In different attacks we may with one have jaundice and with another have none, according to the position of the stone. If the stone gets fixed in the common duct, the commonest position, we have jaundice, which is a troublesome and more or less serious thing. Then there arises an inflammation of that duct from the irritation of the stone, which inflammation may pass up into the liver itself and there may produce abscesses, which are often fatal. Or the stone may ulcerate through the side of the duct, producing peritonitis, also frequently a fatal disease. These are the two consequences of gall-stones which we fear, and by reason

of which we advise operation when a person has had many attacks. I do not think anybody knows how long a time a stone may be there without causing ulcer; probably a long time, but we do not know how long.

We cannot dissolve the stones or do anything for them except relieve pain. The treatment, therefore, is surgery or nothing. If the symptoms are not bad enough to demand surgery, there is nothing one can do, and the patient might as well save his money.

Dr. Bigelow, one of the old-time worthies and honors of the Massachusetts General Hospital, stated the cause or causative factors of gall-stones more tersely than it has ever been done before or since: "They occur in *fat old women.*" But thin young men are not absolutely exempt — nor any one else.

The only other thing we know about their cause is that they often follow typhoid fever. The typhoid bacillus gets into the gall-bladder and presumably causes a low-grade inflammation there. Then nature gets busy trying to squelch that inflammation, and builds a wall around the bacilli. There results a stone which often gives trouble. When we cut open these stones we may find a live typhoid bacillus, even thirty-five years after an attack, as in one case, — shut up there, harmless, but at a great price to the body.

We advise operation in gall-stones whenever a person has had many attacks, and for the reason given, namely, that we have no other treatment, and that there are dangers in the continued presence of gall-

stones in the ducts, and some danger even if the stone remains in the gall-bladder itself.

A successful operation by a skilful surgeon is a sure cure for *those stones*. Gall-stone operations are, with one or two exceptions, the most difficult operations in surgery. There are relatively few surgeons who are capable of doing them well. Operation is a cure of the stones taken out at that time, but a recurrence is possible, and in something like ten per cent of cases stones form again. The effect on the body if the gall-bladder is taken out is good. We have no use for the gall-bladder; it was apparently a mistake. In many operations it is taken out. But owing to the build of the individual it is sometimes very difficult to reach. The surgeon may have to go through six inches of fat to get there.

Gall-stone disease is often taken for stomach trouble. I have had the practice for years of writing down in my records what the patient first complains of, and when the patient comes for "stomach trouble" in about ten per cent of cases she has gall-stones — that is, the pain has been misinterpreted.

If gall-stones are too big to get into one of the ducts, as a rule we do not have pain, but in most cases there are a number of small stones. Once in a while a single large stone ulcerates clear through the gall-bladder. It may ulcerate into the intestine. The gall-bladder first glues itself to the intestine and then the stone ulcerates through. I saw an autopsy recently on a patient whose intestine was blocked by a gall-stone.

I spoke of the important relation of two ducts: (*a*) the common duct uniting those from the gall-bladder and from the liver; and (*b*) the pancreatic duct. A stone may get wedged into a position such as to shunt the bile into the pancreas. The bile, instead of running down into the intestine, runs against the stone, turns, and goes up into the pancreas. There it becomes the cause of a very acute and serious disease, *pancreatitis*, inflammation of the pancreas. It is so acute and usually so fatal that there is almost no provision to be made for the individual and death often results. I mention this as one of the dangers of gall-stones. See Fig. 29.

Cirrhosis. The only other important disease of the liver is cirrhosis. "Cirrhosis" is a very bad term. It means "tawny-colored," because the liver in this disease was supposed to get tawny-colored. Cirrhosis is really a hardening and contraction of the liver due to millions of scars, those scars themselves due to irritation, probably from alcohol plus *x*. Alcohol alone is not enough to do it. We cannot produce it experimentally in animals with alcohol. At the same time almost every patient that has it is alcoholic. Probably there is some unknown factor which combines with alcohol, causes that inflammation, and produces these scars which harden and contract the liver. It is one of the most serious results of alcoholism. The *most* serious result is mental and cerebral degeneration, changes in the mind. But next to that, cirrhosis of the liver is the

most important evil result of alcohol, for it is an invariably fatal, though rather slowly fatal, disease. As the liver becomes smaller it gradually becomes so hard that the blood cannot pass through it. The venous blood coming from the intestines has to pass through the liver before it gets back to the heart. If, then, the liver is blocked by the contraction of innumerable scars, the blood stagnates in the veins of the abdomen and we have the usual result of stagnation, dropsy. The serum oozes from the blood vessels and accumulates in the peritoneal cavity. That is called *ascites* — the accumulation of fluid in the peritoneal cavity, whereby we see an unfortunate individual whose arms and legs are very meagre, and who has an enormous abdomen. We put in a hollow needle, draw off the fluid, and relieve the individual for a few weeks. Then the fluid reaccumulates, and so on. Every time that we tap, although we relieve the patient of the pressure and discomfort of the fluid, we take out a very valuable fluid which he cannot well spare, and the loss of which gradually weakens him until he dies.

Death sometimes comes in cirrhosis of the liver from vomiting of blood. The veins that leave the stomach, some of them, drain into the liver. If the liver is blocked so that the blood cannot pass through it, the blood stagnates in the stomach until a vessel breaks and we have bleeding and vomiting of blood which may be fatal.

In this disease, as in so many other long-standing

diseases, the patient often becomes weaker and weaker, then catches some acute infection, such as pneumonia or tuberculosis, and cannot withstand it. He usually dies of what we call a "terminal infection," a swarming in of bacilli which he ordinarily would resist, but which in his weakened condition he cannot. The disease probably lasts many years, but we do not ordinarily know of its existence until within the last year or two of life. The patient is never able to work much after ascites appears.

Abscess of the liver is very common in tropical countries because of the migration of the germs of some of the tropical diseases up through the intestine by the blood stream into the liver. In the southern part of this country, and in all tropical countries, we have amœbic dysentery, dysentery coming from amœbæ. It results often in the transfer of amœbæ up through the intestine to the liver, and the formation of abscesses there. All tropical countries have amœbic dysentery and liver abscess. We do not see this type of liver abscess here except in occasional cases brought in from other countries, as from Central America or thereabouts. It can be operated on and cured in many cases. Abscess of the liver may also be due to appendicitis or to gall-stones.

Those persons who associate very widely with sheep and sheep dogs, such as the inhabitants of Iceland, Australia, and Greece, are often afflicted with another disease of the liver, *hydatid*, a parasite which they get

from the sheep or the sheep dogs, and which forms enormous bladder-like cysts in the liver. We see it here every now and then in Greeks. It never occurs in this country unless imported, and it is so rare that it is not of any great importance to us.

A word about ordinary, so-called "*catarrhal jaundice.*" A painless jaundice, well in a few weeks, is usually catarrhal jaundice, an acute inflammation of the bile ducts whereby they close for a time. The bile cannot pass down; therefore it comes back into the blood and the patient becomes jaundiced. This lasts from two to six weeks. If it lasts longer it usually is not "catarrhal jaundice," but a jaundice due to gallstones or cancer.

Catarrhal jaundice gets well of itself. Medicines make no difference. It is uncomfortable, but that is all. The patient is generally blue mentally, although yellow cutaneously, and needs the visits of his friends more than of his doctor.

Cancer of the bile-duct produces a persistent, usually painless, but intense jaundice, lasting months and terminating fatally. It usually occurs — like cancer elsewhere — after middle life. There is no treatment.

Cancer of the liver itself is usually a late complication and extension of stomach cancer. It is usually painless and always hopeless.

Tuberculosis rarely affects the liver. Syphilis occurs there as it does everywhere, but there is no especial reason for going into that.

Remember, then, that the liver is very rarely diseased, and that its only common disease of great practical importance is gall-stones, because this is almost the only liver disease that we can do anything about.

2. *Diseases of the Intestine.*

Without any question the most important disease of the intestine is *appendicitis*, a disease discovered by a physician of the Massachusetts General Hospital, Dr. R. H. Fitz, some thirty years ago. The appendix is like the little finger of a glove, and hangs off from the point where the small intestine joins the large; it has no use whatever. We do not know the cause of appendicitis, but there are good reasons for suspecting that some cases, if not all, are due to a streptococcus. Streptococcus disease, the same thing that we have as tonsillitis, the same thing that causes so much heart disease and kidney disease, is now suspected to be the cause of some cases of appendicitis. Only in a very indirect way could wet feet have any relation to appendicitis. Wet feet may be part of a general chilling of the body, chilling of the body reduces vitality, any reduction of vitality makes germs happy. Appendicitis comes oftenest in young people at the age when all streptococcus disease is most apt to strike, and I have seen a group of cases which immediately followed tonsillitis.

Appendicitis is commoner, then, in young people, and commoner in men than in women. It attacks people in perfect health as well as people who are run

down. If anybody took the contract to prevent appendicitis he would lose money by it. We have not any idea how to prevent it to-day.

Many who know nothing else of anatomy know that the appendix is halfway along an imaginary line drawn from the navel to the hip bone (felt as one puts the hand upon the hip in front). The middle of that line is the base of the appendix, in the space called the "right iliac fossa." (*Fossa* means, literally, ditch. *Iliac* means near the big bone that we call the *ilium*.) The earliest pain from appendicitis is usually not over the appendix, but in the middle line, at the pit of the stomach. That is one of the reasons why we often fail to recognize it. But the tenderness of appendicitis — that is, the pain on pressure — is usually over the appendix itself. Nothing worse could happen to us, or to any one whom we influence, than to suppose that *all* pain in the right iliac fossa means appendicitis. There are a vast number of pains in that region, connected with constipation, with menstruation, with muscular strains, and other slight indispositions. Only *those pains* in the right iliac fossa are serious which are accompanied by tenderness, by slight fever, rapid pulse, and usually by changes in the blood. There are a great many lay diagnoses of appendicitis. Yet it may be one of the most difficult diagnoses that a physician ever makes, and one that a layman should be very slow to make. Chills are rather an uncommon symptom; chills depend upon high fever, and the fever in

appendicitis is usually not high but moderate, usually 100.5° or less. Pain, vomiting, tenderness, rapid pulse, fever, changes in the blood, and the peculiar feeling, which the physician appreciates, in the abdomen over the appendix, — these are the chief diagnostic points.

From the layman's point of view one of the most important things is to distinguish genuine acute appendicitis from the many things called "chronic appendicitis." Acute appendicitis is a well-known, well-studied, very important disease, and anybody who has had more than one attack of it ought, I think, to have the appendix out. Chronic appendicitis is a disease the very existence of which some of us doubt; it is poorly understood if it does exist, and a person may well have it throughout his life and never find it out. We should influence anybody we know to have an operation done if he has had more than one attack of *acute* appendicitis, but use any influence we have toward caution and expert diagnosis for any one who is said to have *chronic* appendicitis. Chronic appendicitis does not have the symptoms that I have described, and each doctor that we ask to describe the symptoms will give us a somewhat different description. Under those circumstances it is well to be cautious, I think, as to operation.

People who cannot get operated upon at once for acute appendicitis may get through by starving themselves in the attack. Other than operation the essentials of treatment are starvation and rest in bed. Starvation is necessary because every mouthful of

food taken into the stomach sends a wave of contraction down the intestine as far as the appendix and beyond it. That wave of contraction stirs things up and prevents the quieting down of the inflammatory process. For the same reason a purgative, which is often given, is the very worst possible treatment. Many people and even some physicians say that it is a good plan to clean ourselves out when we have a stomach-ache. If the thing we are afflicted with happens to be appendicitis, we could not do anything worse. A trifling case is often made serious or even fatal by ill-timed purgation.

As a rule surgeons do not want to operate at the height of the attack. The course of the experienced surgeon is something like this: He has seen a patient, say, at eight o'clock in the morning, has recorded the pulse, temperature, blood, and noted the condition of the abdomen; he sees him again at ten o'clock; if things are getting better, he waits — if worse, he operates. So he follows the patient along at two-hour periods, and as long as things are going well he waits, hoping to operate between attacks. If the patient gets worse, he may have to operate at once. The patient should be where a skilful physician can get his hand on to the abdomen and his eye to the microscope within two hours. Under these conditions one runs, as a rule, no risk in waiting while the attack is subsiding.

In examining the blood in appendicitis, or in any fever, the doctor is looking for *leucocytosis*. Leucocy-

tosis means the mobilization of the army that fights on our side against the germs. We can rarely find the germ in the blood, but we can find the army which begins to gather in all parts of the body as soon as there is trouble in the appendix. Just as if we saw soldiers on the roads we might know there was a call for them somewhere, so if we find the number of leucocytes in the blood vessels increased, we know that they must be gathering to meet some invader. If we know also that there is a local tenderness in the right iliac fossa, we strongly suspect that the invader is there. We count the leucocytes and count them hour by hour to see if the count rises above normal. If they have been numerous and grow less, it means either that the patient is getting much worse or that he is getting better; we cannot tell much about that from the count alone.

Inflammation of the intestine is called *colitis* when it affects the colon, or the lower four or five feet of the intestine, and *enteritis* when it affects the smaller intestine above. The disease produces diarrhea in a great majority of cases. It may be very unimportant or very important, according to what other symptoms go with it. Diarrhea is sometimes the result merely of nervousness; more often it is the result of some infection or of some food which has irritated the intestine. Diarrhea is the beginning of many acute diseases like typhoid fever; it is the final stage of a good many chronic diseases like cirrhosis or Bright's. It is very apt to make people faint. It is important to know that

without being at all seriously ill, any one whose bowels are loose is likely to feel faint or actually to faint. With old people this may mean a fall and serious injury from the fall.

The appearance of blood in the discharges is not necessarily serious. In children it is quite common. The appearance of blood in movements previously free from it may lead the doctor to call it "dysentery" instead of "diarrhea," although nothing has changed except the name. The appearance of mucus is also of no especial importance, and does not mean any severe inflammation. The gravity of the trouble is judged by its duration, by the patient's strength, and by the examination of the stools. The serious cases are usually those which last a long time. The intestine can stand a great deal of inflammation, and the body can bear a great deal of this trouble, but after months and years it begins to be a strain.

Outside the tropics chronic dysentery (chronic diarrhea, chronic enteritis) is rare, but most of us have known veterans of the Civil War who got amœbic dysentery in the Civil War and have never got altogether rid of it since.

"Simple diarrhea" or acute colitis of adults gets well as a rule in a week or ten days. The important remedies are rest and warmth and starvation. Such a person should stay by the fire, move as little as possible, and eat as little as possible for a day or two. One cannot keep that up indefinitely, of course. It makes little

difference what we eat in cases of acute diarrhea. There is a very widespread superstition that boiled milk has a particular efficacy in diarrhea, but it has not. The main thing is to put as little of anything in the stomach as possible, and, because boiled milk is so boresome a food, we generally soon get sick of it and so put very little in. We should not eat any food containing a large amount of cellulose and a large, irritating residue, e.g. corned beef and cabbage. Otherwise there is no choice between carbohydrates, proteids, and fats. The small quantity is the main thing. Foods that are cold sometimes act as cold externally does, to stimulate the intestine, and for that reason we generally try to give food warm as well as to protect the body from cold.

If the patient is seen within the first twenty-four hours the doctor often helps by giving a purge. There is irritating material in the bowel and if swept out it gets better more quickly. In children we often give castor oil or calomel in small doses, and often the diarrhea stops as a result of what seems likely to increase it, a purge.

I remember once talking with a physician who was telling me how he had lost practice and money in the treatment of babies.

He said, "I do not see one baby for every ten I used to see, now."

I said, "Well, why is that?"

"It is like this," he said. "A lady called me up the other day, and told me her baby had a little trouble in

his bowels. 'I have stopped all food,' said she, 'given water in plenty, and one tenth grain of calomel every hour for five doses. Is there anything else I ought to do for the baby?' I said no, not just now. 'Well,' she said, 'if the baby is not better soon I shall want you to come and see him.' But the baby was better, and I was never called. I had taught the mother all she knew and most that I knew about babies."

We ought, I think, all of us, to know as much as that mother did. She stopped all food; she gave the baby all the water he would take, to make up for the drain of liquid from his bowels; she gave the baby one tenth grain of calomel every hour for five hours. A fiftieth or even a hundredth grain of calomel probably would have done as well.

Castor oil is sometimes useful as a purge, within the first twenty-four hours, to clean up the irritating material. If the trouble has been going on longer than that, it is well not to give it. After a diarrhea it is perfectly safe to leave the bowels without any movement for two or three days, because it takes some time for the bowels to fill up again sufficiently to need any emptying.

"Dysentery" is the term generally used in cases where there is blood, but there is no special reason for confining it to that usage. Infectious diarrhea does not always have blood. We can have blood in mild or in severe cases; it is no criterion.

In diarrhea from nervousness we should try to re-

move the cause of the nervousness. I have treated a number of these cases without any reference to the bowels at all, by trying to straighten out the person's mind. That particular type of person often has to be told not to allow the bowels to move. People get in the habit of thinking that when the bowels want to move they always must. Ordinarily that is true, but diarrhea may be a habit, and one which can be broken up only by forbidding the bowels to move more than once a day.

Almost nothing can be done for the diarrhea which accompanies tuberculosis, except to treat the tuberculosis. It is very important not to think that it is hopeless. It often gets well along with the recovery of the patient's lungs.

It is very hard to estimate the chances of recovery from tuberculosis of the intestine, because the diagnosis is almost impossible; I should suppose that they were poor. But for a person who has tuberculosis of the lungs plus a chronic diarrhea, *supposed to be tuberculous*, the chances are pretty good. If it is genuinely tuberculosis of the bowel itself, the chances are probably poor, but it is almost impossible to make that diagnosis. Tubercle bacilli in the stools mean nothing as evidence of internal tuberculosis, because they are often merely sputum swallowed, and passed along.

Intestinal obstruction is a frequently fatal, but luckily rare, disease. A great majority of all cases die. When the intestine is obstructed, behind the point of ob-

struction poisons form with extraordinary rapidity and the patient dies of self-poisoning. Why this is so we do not know, and why it does not happen in constipation we do not know. When the bowels are totally obstructed for more than forty-eight hours, the chances of life are poor.

Obstruction occurs in general from two great groups of causes. It occurs in young or moderately young people as a result of bands or scars in and around the intestines as a result of previous peritonitis or previous operation. All inflammation leaves scars, and it cannot be too often said that every operation also leaves behind it scars and adhesions, so that an operation done for the cure of adhesions generally leaves more than it finds. Adhesions mean bands of tissue, tough fibres, which ordinarily do no harm, but if the intestine happens to get caught round one of those bands, "strangulated," as we say, only a very rapid and skilful operation can save life.

Of this same type is *strangulated hernia*. Hernia is the protrusion of a piece of bowel under the skin through a weak place in the abdominal muscles. In the groin or in the scar of previous operations on the abdominal wall there is often a weak place. The constant pressure of the intestine outward in the course of coughing or muscular exertion weakens and stretches this place until finally a bulge occurs and we have "rupture" or hernia. It is nothing but a bother except for the chance of its becoming strangulated, but this bit of

bowel which protrudes through the abdominal wall, until it has nothing but the skin and subcutaneous fat over it, may at any time get caught, bent upon itself, and narrowed so that its contents cannot pass on. Then obstruction or strangulation of the gut occurs. We ordinarily hold up a hernia with a truss; that is, we have something that presses up against the weak place and holds the hernia in place. When strangulation occurs there must be a rapid, skilful operation or death will follow. The operation means cutting the band and straightening out the kinked intestine.

To laymen it seems to me a practical point that all unnecessary operations should be avoided *for this among other reasons:* that all operations on the peritoneum leave scars there, and those scars are always liable to produce fatal intestinal obstruction. Another point is that hernia, rupture, is never a wholly unimportant matter because of the danger of strangulation, and as a result of that danger we nowadays advise every young, strong person who has a hernia to have it cured, to have the weak place sewn up. It is an operation of almost no danger in skilful hands, and in young, strong people. In old, weakened people, or with an unskilful surgeon, it is dangerous. Those who examine candidates for military service always refuse men with hernia.

The other common cause of *intestinal* obstruction is *cancer*, and when obstruction occurs in elderly people the chances are very great that it is due to cancer of the intestine. This is a slow disease, quite unlike that

which I have just described, coming on gradually with increasing constipation in elderly people, with plenty of time to consider what is to be done, but unfortunately with very little to be done. We can almost never remove the whole of an intestinal cancer; usually all we can do is to give the person relief for a little while, months or years, by making another opening in the bowel above the obstruction, so that the bowel's contents may be discharged for the rest of the person's life through the abdominal wall. It will save life and prolong it, but at a pretty high price of discomfort.

Of course it is possible to cut out the particular piece of the intestine affected, but when cancer is in the bowel it is almost always in some other place whether we find it or not. It is usually spread much more widely than appears, and hence we cannot get it all out.

After an operation, the length of time before exercise should be taken depends on the length and width of the scar. Many cases of appendicitis have a line-scar not more than an inch long, and if everything is done to prevent damage to the abdominal wall it heals within two or three weeks. A scar a foot long is very much harder to make sure of strengthening, and the person can hardly ever be safe from hernia. If the scar is parallel to the muscular fibres and not across them, there is a very much better chance of a firm, unyielding result, avoiding a hernia through the scar.

CHAPTER VII

DISEASES OF THE KIDNEY AND BLADDER

Diseases of the Kidney

BRIGHT'S DISEASE is the most important disease of the kidney from the point of view of laymen and social workers. Bright's disease comes about chiefly because of the wear and tear upon the kidney in the process of getting poisons and bacteria out of the body. The kidney is one of the three or four great channels by which poisons are got out of the body, whether those poisons are organized — that is, bacteria — or unorganized — like arsenic and mercury. The kidney suffers in the wear and tear, and we get latent, usually chronic inflammations, which finally come to the doctor as Bright's disease. We have acute and chronic — that is, short and long — types of Bright's disease, the acute type much rarer and much less serious.

Acute Bright's disease is seen most often in children, especially in connection with scarlet fever, when the germs of scarlet fever are on their way through the kidney. Hence a post-scarlatinal nephritis is one of the things we fear most in scarlet fever. Any other of the infectious diseases that children have may produce nephritis, but very few of them do. Next to scarlet fever, diphtheria is the most dangerous, and next to

that, the streptococcus disease which starts in the throat, to which I have referred so often as a cause of joint trouble and of heart trouble and of wound-infections. Streptococcus sore throat, or streptococcus disease starting elsewhere in the body, may, in children as well as in adults, hurt the kidney seriously. One of the things that we have just begun to realize is that what we call "a simple sore throat," "a little touch of tonsillitis," may have very serious effects upon the kidney. One of my colleagues had such a sore throat with a resulting nephritis which will never get well, and which will end his life within a year or two.

Poisons such as mercury and lead are also causes of Bright's disease. Mercury taken with suicidal intent in countries such as Germany, where less painful poisons are hard to get, causes many deaths from acute Bright's disease. The other day in the out-patient department of the Massachusetts General Hospital we had a very pitiful case of a negress who had pediculosis (extra inhabitants in the hair) and for the relief of that had rubbed in a mercury ointment. She had bought only a small box, containing about a teaspoonful apparently, but she had got a tremendously severe mercurial poisoning as a result. One effect was acute Bright's disease.

Corrosive sublimate used as an antiseptic does not generally do any harm, but occasionally, in women after child-birth, its use as a douche within the womb results in the death of the women through the entry of

the mercury into the uterus, its absorption there, and subsequent poisoning of the kidney.

Bright's disease does not result from getting cold, or from eating anything in particular, or from any of the causes that people are apt to assign. It cannot come from any strain of the back or from any blow or any local cause. So far as we know it comes only from the two classes of causes that I have spoken of — germs and poisons.

Acute Bright's disease gets well or kills within a few weeks. Chronic Bright's disease never gets well, but may persist with very fair health for ten or even twenty to thirty years. Like acute Bright's disease it shows itself by swelling of the whole body. I have seen a child puffed up till he looked like a pin-cushion, — face, hands, and feet tremendously swollen, — and yet entire recovery follow. That swelling is called dropsy, and the kidney is the other great cause, aside from heart disease, of dropsy. Kidney disease in the acute form, without disease of the heart, may cause dropsy, but the dropsy usually differs from heart dropsy in involving the face first, whereas heart dropsy involves the feet first. Along with dropsy come changes in the urine, some of which are easily seen, such as the bloody color due to blood in the urine (some cases only). Others are microscopic, although none of them are difficult to recognize.

Bright's disease also shows itself in a poisoning of the nervous system. I have said before that the func-

tion of the kidney is to take poisons out of the body. When it is damaged, poisons accumulate in the system and produce a self-poisoning which we call *uremia*. There are two roots in this word, the *ur* which means urine, and the *emia* which means blood. Thus the word means urine in the blood, which is not quite true. But some substances from the urine do get into the blood as a cause of uremia, so that it is a perfectly proper term. Some of those poisons affect the brain. As a result we have, first, headache; second, vomiting, of the *brain* type — i.e., a vomiting which has nothing to do with food. The ordinary stomach kind of vomiting comes after food and as a result of food; the brain type comes just the same whether there is any food in the stomach or not. Headache, vomiting, then convulsion (fit), and coma (unconsciousness) — this is the group of symptoms produced by acute uremia, and in spite of all those symptoms, and more too, a person may get wholly well from acute Bright's disease. We never despair so long as we are sure that the disease is acute, not chronic.

There are two other striking symptoms: one is blindness, — sudden, complete blindness, — due to the effect of the poison on the nerves at the back of the head, the occipital lobe of the brain where sight is. One of the strange things about sight is that we see with the back of the brain and not with our eyes alone. In uremia the poisoning of the brain may involve sudden loss of sight and also delirium or temporary insanity.

I remember a little boy brought into our wards, absolutely blind and in violent delirium. He had convulsions, was unconscious, and had a urine full of blood. He had also a peeling round his finger ends, due to a scarlet fever which had not been noticed. That little boy got absolutely well and stayed well.

The treatment of acute Bright's disease, with or without acute uremia, is in the first place the removal from the kidney of all possible strain. There is strain upon the kidney in the effort to excrete the products of digestion. To give it nothing to do, we starve the person, — and for an acute illness which is only going to last a few days it is safe and right to starve him. This rests the kidney, allowing it to heal. We give water and nothing else in the earliest days of acute Bright's disease. Later we give the next mildest of all foods; that is, milk. No medicine helps the kidney at all to get rid of this inflammation, but we do something to rest the kidney and to relieve dropsy. Dropsy is removed by purgation, by drawing water out of the tissues into the bowel and thence out of the body. It is relieved also by sweating. Patients with Bright's disease are given a hot-air bath or a hot pack, with the idea of drawing water out through the skin. We put the patient in bed with rubber sheeting around him, so that no heat can pass out, and then put the upper end of a piece of right-angled stovepipe up under the sheeting, and a lamp under the lower end of that stovepipe. The heat goes up through the pipe and under the bedclothes, where

it is held in by tucking blankets tightly round the patient's head and feet. As a rule we cannot get it too hot, not above 120°, the temperature we like to produce. We leave the patient there half an hour or so, provided he perspires freely. The stovepipe must be sheathed in asbestos; else we may set the bed afire.

In relation to social work, the most important thing is to know the danger of acute Bright's disease after the acute infectious diseases, especially after scarlet fever, and as a result of mercury or arsenic poisoning. It also occurs in pregnancy, is one of the dangers of every pregnancy, and that also has to be taken into reckoning.

Chronic Bright's disease, of which there are several types which laymen do not need to distinguish, lasts for many years. Those who have it often die of something else rather than of that disease. Most of the symptoms of chronic Bright's disease are not on the part of the kidney, but on the part of the heart, for one of the most important effects of chronic Bright's disease is to raise blood pressure and so to weaken the heart. I referred to high pressure in connection with arteriosclerosis. There are only three important causes for high blood pressure, arteriosclerosis, chronic Bright's disease, and eclampsia, actual or impending. High blood pressure produces first an over-strong heart, the heart compensating as it does so wonderfully, and then finally weakening and failure.

It is the heart, then, that shows most of the symp-

toms of chronic Bright's disease. Patients may come to a doctor for nausea or headache, but generally for short breath and swelling of the feet and the other familiar symptoms of heart trouble. All the manifestations of *uremia* which I mentioned under acute Bright's, may also come in chronic Bright's, although they are more rare in the chronic types. They may come suddenly, when a person has been in tolerable health and not aware of any poisons in the system. We must realize that a chronic disease like Bright's may exist quite unknown for years and then suddenly "wake up" and produce symptoms, so that the patient is apt to say that he knows just what brought it on him yesterday. Yet the doctor, finding his blood pressure high and his heart twice its proper size, knows that the disease has been going on for some years, because it takes years to produce such enlargement of the heart. That is very important, especially in regard to industrial compensation. Only recently I saw what I believe to be the greatest injustice in the awarding a man several thousand dollars, the full value of a man's life as it is taken to be, because his heart had suddenly failed while he was at work. His blood pressure showed that his heart had been diseased for years. But he had not known that he was sick, and therefore his work was blamed as the cause of his trouble, and the State had to pay several thousand dollars, wholly unjustly, I think. That sort of error is going to be corrected, I believe, by the physical examination of employees. Employers must

protect themselves by having the blood pressure measured in all employees over forty years old. In that way they will weed out these men who are liable at any moment to have the heart give out whether they are at rest or at work, and to bring this big penalty down upon the employer or upon the insurance company.

Oftentimes in the chronic Bright's disease, blindness or partial blindness is the first complaint. A good many of these patients go to an eye specialist complaining wholly of poor sight, without any knowledge that any other organ is diseased. The doctor finds in the retina hemorrhage and inflammation of the type that Bright's disease can produce in the eye, and knowing that he can do nothing, refers the patient to a general practitioner to see if anything can be done to help the disease. The blindness may get a little better, but patients never get back their full sight, and as a rule they get very little.

The treatment of *chronic* Bright's disease differs from that of *acute* in that we cannot starve the patient or spare the kidney for months and years as we can for a few days. So we can only make slight changes in his diet, the essential of which is to cut down on meat and meat soups. Next to that the most important thing is to leave out as much as possible of the salt which he adds to his meals. Salt has the property of attracting water — as we all know from our observation of table-salt — outside the body and inside the body. The salt that we take with our meals tends to hold water in the

body, and if we have a disease like Bright's, which already tends to produce dropsy, all the salt we take into our bodies tends to increase the danger of dropsy. We caution people not to cut salt out altogether, but to add as little as possible and yet have some appetite for their meals. Medicines here, as in acute Bright's disease, have no effect except in so far as they help to relieve dropsy or to stimulate the heart.

One of the common complications of chronic Bright's disease is apoplexy or cerebral hemorrhage. I have said that the blood pressure is raised in chronic Bright's. The results of high blood pressure are shown in many ways, but nowhere so seriously as in the brain, where the breaking of a small artery (which would do no harm anywhere else) may be fatal. Apoplexy, of which the popular name is "shock," means that an artery in the brain suddenly becomes useless, or breaks. It may become useless by being plugged. In that case it does not supply the brain with blood, and the trouble is just as great as if it should break and let blood out into the brain. Apoplexy is the death that we should all of us pray to have come to us. It is the most painless, the quickest, and it rarely comes to any one who is not hopelessly diseased, either by this trouble or by some other. The symptoms are sudden unconsciousness and paralysis, more or less widespread, usually of half the body — "hemiplegia."[1] Any one who comes to an

[1] Notice the stems: *hemi*, half, and *plegia*, paralysis. We see that *hemi* in other things, as *hemi- anesthesia*, numbness of half the body;

out-patient department must see a good many of the old hemiplegics, scuffing one toe and holding one hand turned in across the body. They often live for years after their first attack; that is, although, as I have said, a severe apoplexy often causes sudden and painless death, it may be so slight that the person will live on for many years before he has another break in his cerebral arteries.

I think it always results in some mental impairment. Sometimes this is very slight, but I think there is almost always some mental change, and there is often change in speech, aphasia.[1] Aphasia means that although the person knows what he wants to say, he cannot say it even though his tongue is not paralyzed. Ordinarily he can write what he wants to say, but cannot speak it.

I remember when I was a boy hearing a course of emergency lectures in which we were told the proper treatment for *apoplexy* and for *epilepsy*. In one of them, we were told, be sure to have the patient lie down, and in the other sit up — I soon forgot which was which, and I was very much worried then; but later, when I came to study medicine, I was greatly comforted because I came to know that it does not make

hemi- chorea, chorea affecting only one half the body. *Para plegia* means paralysis of both legs; *mono plegia*, of one leg. Knowing these stems one can often recognize the meaning of a word never seen before.

[1] In the word *aphasia*, *a* means that you cross out the meaning of whatever word comes after it, and *phasia* means speech. Thus, *a-nemia* means literally no blood; *a-nuria*, no urine.

the slightest difference what we do in such cases. When a person has apoplexy he is going to get well or die according to the nature of the disease, and what we do or the physician does at the time of the attack makes no important difference. The trouble is out of reach, inside the brain. In a way it is very hard to sit still and do nothing about it. We want to fly around and be busy, but in truth there is absolutely nothing to do. In future this may not be so, but nobody has as yet discovered anything to check or cure apoplexy or epilepsy. The layman may well remember that in the acute attack of either disease he is just as good as the most skilful physician in the world, because neither can do anything whatsoever.

I do not think anybody would be likely to mistake sunstroke for apoplexy. What we do in sunstroke makes all the difference between life and death. But epilepsy has exactly the same treatment as apoplexy; namely, no treatment at all. The patient cannot choke in either case. If the tongue slips back into the throat he soon rouses himself enough to cough it out. The difficulty in breathing is due to the involvement of the breathing centre. We breathe by reason of a little nerve centre of the lower part of the brain, whence a rhythmic impulse is sent out about twenty times a minute. This impulse causes us to breathe. In brain hemorrhages that centre is sometimes damaged and hence breathing may be very difficult. The snoring sound merely means that the patient is deeply unconscious. Any

other disease which gave deep unconsciousness would produce the same kind of snoring.

High blood pressure is discovered by a very simple test. I think any social worker would be the better for knowing it and could learn it in fifteen minutes. For though one of the simplest, it is the most important of all medical tests.

Chronic Bright's disease affects the mind in a considerable proportion of cases, because the self-poisoning uremia that I spoke of as affecting the brain, through headache, vomiting, convulsions, and coma, also affects the other functions of the brain. There are many insanities and mental disturbances resulting from chronic Bright's disease, most of them, very easily suspected if on measuring the blood pressure we find it high.

Floating kidney. The chief point to remember is that in the vast majority of cases it is not a disease. It is a privilege of about half the female sex, and almost the only harm that comes from it is through doctors or friends who talk about it. It is quite a serious thing to be informed that one has a floating kidney. People's imaginations get to work at once; they do not know where that kidney may "fetch up." I have found people grievously and chronically alarmed over this matter. We have all heard of people's hearts being in their throats, and I think they sometimes think their kidney is there. Floating kidney is a perfectly harmless peculiarity or privilege, not a disease, and *sensible*

doctors, when they find it, keep it dark. If it is kept dark it practically never does harm. It was the surgical fad often years ago to operate on unfortunate women and tie up their kidneys. Now it is rarely done except by mistake.

Tuberculosis of the kidney is interesting and important from a number of points of view. The first point is that it is curable, one of the most curable forms of tuberculosis. For tuberculosis is often confined to one kidney, and when it is, it can be cured by the removal of that diseased kidney, since one sound kidney is plenty for one human being. I do not know of any recovery without operation. I should be very much interested in any patient who had a well-founded diagnosis of that disease and had got well without operation, but I should be very critical of the diagnosis. We often find in urine a harmless germ which is so like the tubercle bacillus that there are very few people who can tell the difference: in such cases we may wrongly diagnose tuberculosis, and later wrongly suppose that we have cured it. The disease often goes very far in one kidney while the other is not affected, so that we can safely take out the sick kidney and leave the other.

The symptoms of tuberculosis of the kidney are the next point of special interest because they are so unlike what we might suppose. There are usually no symptoms over the kidney; *the symptoms are in the bladder.* Tuberculous kidney shows itself chiefly by frequent, painful urination. Now that is a very com-

mon symptom in various other diseases, and even in health. It is not in itself in the least distinctive. It may come simply from nervousness or because people do not drink enough water and the urine is too concentrated. Yet frequent and painful urination is *the* symptom, and often the only symptom, of tuberculosis of the kidney. A physician who is consulted about that symptom, if he knows his job, always examines the urine. If the symptom is due to some of the trifling causes, the urine will be normal; if it is due to tuberculosis of the kidney, the urine will never be normal. The physician finds in the urine pus, and following that up he looks through an instrument into the bladder to see where that pus is coming from (by cystoscopy). A small tube can be put all the way into the bladder, and with a light the skilled surgeon can see exactly what is going on there. What he sees, in tuberculosis of the kidney, is that clear urine comes down through one ureter, and pus from the other. When he sees that, he knows the first thing he needs to know. But still it may be non-tuberculous pus that he sees; hence the next thing that he does is to put through the cystoscope, into the ureter through which the pus is coming, a still smaller tube, and thus collect that pus unmixed with anything else. Then he looks at that pus for tubercle bacilli. If he finds what seem to be tubercle bacilli, he may still be wrong. They may have all the marks and still he may be wrong. But there is one invaluable test, and that is the guinea-pig. This disease

is one of the, to me, absolutely convincing reasons for sacrificing an animal for the benefit of human beings. There may be no way of telling whether the human being has tuberculosis of the kidney or not, unless we put some of this pus into a guinea-pig. If there is any tuberculosis in it, the pig acquires tuberculosis; if not he remains unharmed.

If the "guinea-pig test" is positive, we have then a full chain of proof. We started with frequent and painful micturition, which may mean anything or nothing. We examined the urine and found pus, which still may not be serious. We cystoscoped and saw the pus coming down from one kidney while normal urine insuring a sound kidney came down the other ureter. We collected the pus and found something that looked like tuberculosis; not satisfied with this, we put some of the pus into a guinea-pig and waited six weeks — which is a long time, but seems to be necessary. Then, and only then, are we ready to take out that kidney and cure the patient. But as this disease goes on for years before it kills, though meantime it renders a person's life perfectly miserable, the loss of time is not irreparable.

If the pus does not mean tuberculosis, it might be due to many inflammations of the kidney, some of which would not require operation. A pyelitis, inflammation of the pelvis of the kidney, may often be cured without operation by giving urotropin and an abundance of water.[1]

[1] See page 177.

The regular hygienic tuberculosis treatments (rest, food, fresh air) should all be carried out in tuberculosis of the kidney in order to put the patient in good condition to bear the operation. It should also be done to make doubly sure that we are allowing no other tuberculosis to develop elsewhere in the body. But hygienic treatment is not enough. We must operate also. I have not seen any more brilliant cure for disease than the surgical removal of a tuberculous kidney.

Frequent painful micturition is a common symptom in women, and usually harmless, but since it may be due to this painful disease it is of great importance that the urine should be examined and all these other steps carried out as just explained. If there is tuberculosis in both kidneys, so that we cannot remove one, then as a last resource we use the tuberculin treatment, not, however, with very much hope. This type of tuberculosis in both kidneys, like the various other so-called surgical tuberculoses, in bone or joint or gland, deserves also the same hygienic management that helps tuberculosis in the lungs. A bill was introduced in the Massachusetts Legislature of 1916 to ask that we have a sanatorium for non-pulmonary tuberculosis. At present, if we want to get a patient with surgical tuberculosis into a sanatorium, we have to go to some doctor and tell him please to find something the matter with the patient's lungs. Sometimes we can do this and sometimes we can't.

Pyelitis (*pyel* meaning pelvis, and *itis* inflammation), inflammation of the pelvis or outlet of the kidney, is common in girl babies and in women near parturition, either before or after. It also occurs in other people, but not nearly so commonly as in these two groups. It is one of the important causes of unexplained fever, and when a child, and especially a girl baby, has a fever that no one can find the cause for, or when a woman before or after childbirth has a fever with no apparent cause, it often turns out to be pyelitis. It causes no local symptoms whatever; as a rule no pain, no trouble with the passage of urine, nothing. It can be discovered only by the examination of urine, but it always can be discovered in that way. It usually yields to treatment by drugs and water. There are ordinarily no other symptoms except fever; in a few cases there is pain over the kidney, but that is rare. The disease is severe enough to put the person to bed.

I remember quite vividly a little baby girl in our wards whom we studied without finding the cause of her fever. She was so young that no one had thought of collecting the urine. This was finally done, however, and we found that pyelitis was the cause, brought down a fever which had lasted for weeks, and cured the child permanently, simply by giving urotropin and water.

The other diseases of the kidney it is not in my judgment important for laymen to understand.

Diseases of the Bladder

Inflammation of the bladder, or *cystitis*, is practically always due to some trouble outside the bladder. If, for example, a person has tuberculosis of the kidney and the tubercle bacilli are coming down the ureter, they often implant themselves there and cause a tuberculous cystitis. In elderly men disease of the prostate gland, obstructing the bladder's outlet, causes cystitis. But what is called "simple cystitis" usually represents simplicity on the part of the doctor rather than on the part of the disease. It has a cause outside the bladder and the doctor's job is to find that cause. Cystitis shows itself by the symptoms already mentioned in renal tuberculosis; namely, frequent, painful micturition, with or without blood and demonstrable pus in the urine. It is a common result of gonorrhea, especially in women, also in men. It very commonly comes after childbirth in women, or as a result of any disease in which a catheter has to be used.

A catheter is a small tube capable of passing through the urethra into the bladder, and used to draw urine when it cannot be passed spontaneously. Many a patient after operation cannot pass urine, and hence it has to be drawn by catheter. Despite aseptic precautions it is impossible to pass a catheter more than a few times without infecting the bladder, and a cystitis results, usually clearing up when we can get the patient to passing urine without a catheter. In women cystitis

is almost always curable, because in them the chief cause of a chronic cystitis is tuberculosis and that is curable. In men it is often curable by an operation on the prostate gland, the removal of the obstruction to the bladder outlet. There is no inflammation of the bladder due to cold. This form of disease can exist for a long time without poisoning the body. So acute an inflammation anywhere else would be very likely to result in blood poisoning, a very serious danger to life. But in the bladder and in one or two other situations in the body, such as the naso-pharynx, bacteria and pus can exist indefinitely without serious danger to life, although with great annoyance to the patient.

Connected with this inflammation, partly as cause, partly as result, *stones* may form in the bladder and have to be taken out at operation.

Tumors of the bladder are luckily rare; they are of two types, benign and malignant. The distinction can be made only by the microscope. The benign tumor can be cured by electricity, what is called "fulguration," a painless process somewhere between burning and exposure to intense light. By that process carried on through the cystoscope, benign tumors can be cured without operation. Malignant tumors are almost incurable even by operation. Whether benign or malignant, they result in two symptoms, hematuria, or bloody urine, and pain in the region of the bladder. Persistent bloody urine with pain is usually due to tumor, either harmless or serious, in the bladder itself.

CHAPTER VIII

DISEASES OF THE GENERATIVE ORGANS

Female

THE commonest *tumor of the uterus* is the so-called fibro-myoma, ordinarily called "fibroid" of the uterus. It is a benign tumor, not cancer, and it can be cured by operation, and very possibly by X-ray without operation, certainly by radium in some cases. Fibroid tumors are made up of muscle and fibrous tissue. They often exist for years without being discovered and may never need any treatment at all. If they do need treatment it is for one of the following reasons: (1) Because they bleed; in some cases fibroid tumors lead to so continous or profuse a hemorrhage that the patient is exhausted by anemia. (2) Because they may be so large that the weight, dragging, and pressure on other organs are serious and demand help. (3) Because they may interfere with pregnancy or childbirth. (4) Because they may become acutely inflamed or strangulated. They usually cause no pain and never spread to any other organ as malignant tumors do. They may, by their wear and tear, by their pressure upon the bladder, for instance, and upon the rectum, cause bad nervous conditions.

Because the uterus is so close to the bladder, any

tumor of this kind pressing on the bladder causes frequent micturition, and is a bother in that way. It also causes constipation by pressure on the rectum behind. It is disputed whether fibroid tumors ever become malignant. I do not think there is any good evidence that they do. Other benign tumors may; tumors in the breast, for instance. A malignant tumor is not always cancer. There are a number of microscopic distinctions between cancer and other malignant tumors. Malignant tumors are always fatal unless operated on, and often even if they are operated on.

Fibroid tumors of the uterus tend to shrivel up at the menopause, and that is important, because if a woman is at the age when the change of life may be shortly expected, she may be encouraged to bear her trouble with the hope that it will not last very long. On the other hand, in a young woman, one cannot encourage hope for any change except a change for the worse as the years go on. Still, if there is no hemorrhage and no considerable annoyance from pressure, the tumor is rarely important except when the question of marriage and pregnancy arises. Fibroids may seriously interfere with pregnancy and endanger the life of child and mother; therefore, in a young woman, if marriage be contemplated, operation may be attempted even though they are not any special annoyance. The larger they are the harder it is to remove them. When they last for years they almost always become adherent to surrounding organs, to the bladder, uterus, and in-

testine. Operation under these conditions has a good deal of danger.

The operations usually done are two: (1) For small fibroids, to try to take them out of the uterus without removing the uterus (and that is quite often possible). (2) Rather more often so much of the uterus is involved that one can do nothing but remove it wholly, by the operation known as "hysterectomy." Hysterectomy is an operation always involving some risk, no matter who does it, or under what conditions. It is for that reason that we are looking very eagerly for a cure for uterine fibroid through X-ray or radium. But as yet the relative merits of operation and radiotherapy are not settled.

These fibroid tumors are extraordinarily common in the negro race. We generally say that if there is anything the matter with a negress below the waist, it is safe to predict that she has a fibroid. We know nothing about the causation of tumors, whether benign or malignant.

The insurance companies, who need to be right for financial reasons, and who have enormous statistics, say that malignant tumors do not show any discoverable tendency to be inherited. It is well to know, at any rate, that some of the best authorities think that, and that no one can positively say that there is any danger of inheritance of cancer or any other tumor. I am personally convinced by the figures submitted by the insurance companies.

Cancer of the uterus attacks elderly women as a rule, and is not apt to come, as fibroid tumors do, at any period of life. It usually begins in the neck or lower extremity of the uterus, what we call *the cervix*, and produces there a bloody foul-smelling discharge, with, or more often without, pain. It is very apt to come at or after the change of life. All of this, of course, is of great importance to every woman, although we can hold out but little hope of cure by operation. Still, without it it is one hundred per cent of deaths. No one ever recovered from cancer of the uterus except by operation, and although I cannot say that I have ever known a cure by this means, other people have, and life may, at any rate, be prolonged by removal of the uterus, which is the only treatment. X-ray or radium has never cured a case so far as I know. It relieves pain in some inoperable cases, and so may be of value when operation is impossible or is refused.

The reason that I have to speak almost hopelessly of this disease is that, like all malignant diseases, it spreads very dangerously. It is seldom confined to the uterus where it could be cured by removing the uterus. By the time it produces any symptoms it has usually extended into deeper and perfectly unreachable parts. Untreated, it lasts several years, generally two or three.

Surgeons are always impressing upon us the necessity for the early diagnosis of cancer here and everywhere, and they are of course right. But we must know ourselves and confess to others that in the uterus

early diagnosis makes less difference than elsewhere, because we have so little hope of cure. Still, any woman who has a foul, bloody vaginal discharge at or near the menopause should be suspicious of cancer and have an immediate operation if the suspicion is proved correct by expert examination.

So few women know these facts that very few people have ever watched for signs of cancer, and it may be that when a great many such warnings have been noted, we shall be able to discover it soon enough to cure it by operation. Irregular menstruation does not seem a symptom worth mentioning, since irregular menses occur in many other diseases and without any disease.

Inflammation of and through the uterus, puerperal poisoning after childbirth is, I suppose, the next most important disease of the uterus. In our time and in communities like Boston, we see and hear comparatively little of it. At the time when Dr. Oliver Wendell Holmes wrote his classical thesis on the subject, in 1843, it was a very large factor in the mortality of Boston. But modern obstetrics has nearly eliminated *puerperal sepsis*. Nevertheless, in 1913 it caused 542 deaths out of a total of 890,848 in the "registration area" of the United States. Puerperal fever means that germs travel up the genital canal after the child has passed out, and infect the raw, bleeding surface. It shows itself by fever, chills, and sometimes by tenderness over and round the uterus, with a foul discharge.

It is prevented largely by cleanliness on the part of the obstetrician and of the patient. The treatment is coming more and more to be purely hygienic and not local. Very few good obstetricians to-day try to clean out the uterus or to apply any local measure in simple puerperal sepsis. They try to increase the patient's vitality in any way that they can.

Sepsis usually appears about four days after the baby is born. The mother seems to be doing perfectly well at first; then slowly the temperature begins to rise and the other bad symptoms appear. Probably the mother's condition before childbirth has much to do with it. If she were in poor condition her resistance to the germs must be less.

Endometritis is not at all an important disease in the vast majority of cases; but it is a term so often heard that we must know it. Endometritis means inflammation of the inside of the uterus (*endo*, within; *metra*, uterus; and *itis*, inflammation). The most important form of it is that which forms part of the disease gonorrhea. Gonorrhea attacks all parts of the female genital organs, and along with this, as I shall mention later, comes inflammation of the inside of the uterus, with a discharge of pus. The diagnosis is made by bacteriological examination: a drop of pus taken from the uterus, if stained and examined under the microscope, will usually give the evidence that we need as to the origin of the inflammation. The inflammation itself is not characteristic aside from the bacteriological

examination. It often causes no symptoms and has no important results unless it spreads to the Fallopian tubes. (See *salpingitis*.)

Hyperplastic endometritis is an inflammation accompanied by an excessive formation of tissue in the inside of the uterus, the symptom, and the only symptom of importance, being hemorrhage, bleeding at or between menstrual periods. It is for this that curetting or scraping of the redundant bleeding tissue inside the uterus is most often justifiably done. Such an operation generally gives relief.

Then there is a group of troubles connected with the lower segment of the uterus, the cervix, which are again mostly matters of names which one may hear used and need to understand though they are not very important to the patient. *Endocervicitis* is inflammation of the inside of the cervix of the uterus. *Cervix* means neck. This is a common cause of leucorrheal discharge which is very common, both as a symptom of debility without serious disease, and as a part of disease in the uterus itself. The endometritis just referred to may be confined to the neck of the uterus and is then more definitely endocervicitis.

Then the term *erosion* or "ulceration" of the cervix is used a good deal accompanying one or the other types of endocervicitis or without. Without anything that one can find as a cause, there occurs an ulceration at the exit of the uterus which gives no pain, although it looks red and angry and produces a constant dis-

charge. It is very often associated with tears in the neck or outlet of the uterus as a result of childbirth. These are often spoken of as *lacerations*, a long word for the same fact.

With practically all tears there is more or less erosion or ulceration such as I have just mentioned. There is a good deal of difference of opinion as to how much these tears and erosions matter. Some physicians feel that they constitute a considerable factor in the debility which women often have to suffer from a multitude of causes. They believe that endocervicitis, tears, and erosions about them, while not in themselves very important (as practically any physician would to-day admit), are still an important though minor factor in pulling down health. I do not think so myself, but I recognize that there is room for difference of opinion about them. I have, in a good many years' service at the Massachusetts General Hospital, seen them in hundreds and hundreds of women, who seem to suffer no harm from their existence through months and years.

Even the public hears nowadays a good deal about the "cervix-and-perineum operation" for the repair of tears both in the neck of the uterus and at the outlet of the vagina, — tears due to the process of childbirth. The last of these, *lacerations of the perineum*, are certainly a cause of trouble, because they leave the pelvic organs without proper support from below, so that the pelvic organs get very low, pull upon their supports above, and give an uncomfortable sense of dragging

and pain. Hence, when a cervical tear is accompanied by a perineal tear, the combination may be important and it may be difficult to say that the cervical does not add somewhat to the trouble.

A further possible importance of cervical tears and ulcerations is that it is believed by some physicians that chronic ulcerations of the cervix of the uterus lead to cancer. I must also say that it is believed by some that they do not lead to cancer. The latter is my own belief.

Many physicians say that all tears of the cervix should be repaired, provided the woman is not to have more children. If she has come to that time of life, all cervical tears should then be repaired (some say) because if not repaired they may lead to cancer. It is perfectly foolish to repair a tear in a woman who is going to have more children, because it is sure to tear out again.

Cervical tears are often of importance to determine the question whether a woman has ever been pregnant. I have found them a number of times in women who denied pregnancy and thus had a much more definite proof than would otherwise have been possible. Cervical tear never occurs from any other cause.

I will put in here what I have to say in relation to evidences of virginity. The presence of the hymen, the membrane which nearly closes the entrance of the vagina, has often been taken as evidence of virginity; never, however, rightly. In a virgin the hymen may

be practically absent, may be so stretched or so slight that it amounts to nothing. Moreover, it may be torn without a person's ever having had sexual intercourse; no physician to-day in any medico-legal case, goes by the condition of the hymen where it is important that he should be right. Any woman who has ever had a pelvic operation or had gynecological instruments used, is likely to have tears in the hymen which might be very falsely interpreted.

The *Fallopian tube* is the passage leading from the uterus nearly, but not quite, to the ovary.

Salpingitis, inflammation of the Fallopian tube, is often called *pyosalpinx* — which is a little more definite, and means an inflammation that makes pus. A familiar term for that last is "pus tube," and physicians often say or write in textbooks, "At operation we found a tube." I have known patients to be much worried about this, thinking that the surgeon had found that somebody had left a drainage tube in the body at a previous operation. But the phrase merely means an inflammation of the Fallopian tube.

This is the most important of the effects of gonorrhea in women. Gonorrhea is not the only cause of salpingitis, but it is much the commonest and much the most serious form. Salpingitis produces two important results: —

(1) It seals up the Fallopian tube. This is the commonest cause of sterility in women. When the tube is closed, the ovum or seed cannot pass down to the uterus

nor meet with the spermatozoa. That in itself, obliterating salpingitis of one tube, does not always cause symptoms. It may mean merely the sealing of this little tube which is smaller than a piece of chalk. Being closed, it may not hurt the woman at all, but the sterility is of course a great misfortune to her.

(2) The other result is the formation of pus in and around the tube. This is perhaps the commonest and most troublesome of all diseases that are peculiar to women. It produces the familiar symptoms of inflammation, namely, pain, tenderness, and a fever with a long-drawn-out course extending over weeks and months, often with relapses. Doctors speak of it as "flaring up" now and then, as they do of tuberculosis. Finally comes either spontaneous healing through the formation of scar tissue and the absorption of the pus, or the breaking into some of the surrounding tissues, especially the peritoneum with virulent and sometimes fatal peritonitis. The last is rare because either healing or operation usually prevents it, but even after operation there are a good many deaths. The operation for pus tube is often a serious and difficult one and is not necessarily a cure.

Because this inflammation is of so long standing, it has the usual result of long-standing inflammations, in adhesions, so that the tubes stick to the surrounding parts. The tube becomes adherent to the ovary, or to the rectum, or to other portions of the intestine. This is sometimes important both as a cause of symptoms,

such as pain and constipation, and also as making the operation for removing the tube a very difficult one, for the operation means trying to separate, with the finger or with instruments, adhesions which may tear into the bowel at any minute and through whose tearing we may have a serious peritonitis. Surgeons are operating on these cases less and less; there are not half as many operations of this kind as there used to be fifteen or even ten years ago. It is recognized that if we put the patient to bed and do what we can to increase her vigor, she will usually live down the inflammation, and get as good a result as operation could achieve. The inflammation will generally seal up the tube, but that is not any worse than what will happen anyway, as operation involves removing the tube.

Chronic invalidism in women following marriage, with dragging, pain, and fever, is very often due to this disease; probably more often than any other one trouble. It is apt to come soon after marriage, because that is the time when infection by gonorrhea is most apt to occur. In such cases the husband supposes himself to have been cured long ago of gonorrhea, but has not, in fact, been cured.

In relation to social work the importance of this disease is that it means a long, tedious illness, usually without danger to life, but usually with permanent impairment, more or less marked, of vigor and the ability to do what healthy people can. There is almost always some trouble due to the adhesions. Operation does not

prevent these adhesions — it often produces more, adding to what were there already, so that we have no way of escaping that. Operation only safeguards the patient against peritonitis of a more widespread and dangerous type, and is now usually performed only when this danger seems imminent.

As a part of salpingitis the patient has what is called "pelvic peritonitis," or inflammation of that part of the peritoneum which dips down into the pelvis. As long as it is confined to that region the peritonitis is not serious. It is only when it becomes *general peritonitis*, when it spreads to the rest of the abdomen, that it is a serious menace to life. The word "peritonitis" means very different things from the point of view of seriousness. General peritonitis is one of the most fatal of diseases. Pelvic peritonitis is enormously common, but practically never fatal, because local.

It is a mistake to suppose that all cases of pus tube are due to gonorrhea. We probably never shall know what proportion are caused in that way, because the results of bacteriological examination of pus found at operation is not conclusive. One may find the organism of gonorrhea, but if one does not find it one is not by any means sure that it is not there. We are sure that some cases of salpingitis are not due to gonorrhea — we cannot say how many. Hence it is important not to assume that merely because a woman has had a pus tube she has had gonorrhea.

The only other type of pus tube or salpingitis to

which we can give a definite name is the tuberculous type, quite a different affair, more common in young, unmarried women than in older women. It rarely remains local but generally spreads to the rest of the peritoneum.

Aside from surgery we have no important remedies for the diseases that I have been going over, except hygiene and rest. We have no medicines that have any considerable effect, and the great bulk of medical opinion to-day is against local applications and medications, of which there has been a vast deal in the past, most of us think with less than no good. That is, gynecology, or the specialty that deals with diseases of the female genital organs, is to-day not a specialty, but a branch of surgery, so far as it is a legitimate, honorable part of medicine. We are proud that we have no department of gynecology in the Massachusetts General Hospital, and we are firmly determined that there shall be none. To make gynecology a specialty or a separate department is to attempt an impossible subdivision within the field of surgery, because no one can know the surgery of the pelvic organs who does not know the surgery of the whole abdomen. As a matter of fact, "gynecologists" of the type of Kelly, include in their domain the gall-bladder and appendix, the kidney, and sometimes the breast. Gynecologists have long since given over any attempt to define their province strictly and by their practice maintain, what I have just said, that no one can be a good surgeon in any

part of the body without being a good general surgeon. There used to be a so-called medical gynecology, but we are convinced that there should be no such thing. It means the application of remedies to an eroded surface, the application of medicated cotton and such things to the vicinity of an inflamed tube, putting in what is called "packing" in a quite useless attempt to bring a displaced uterus up into position. These procedures keep a woman coming for treatment, with great harm to her pocket-book and often, I think, to her character.

There is a difference of opinion among physicians as to the possible use of an instrument that is called a "pessary." A pessary is a hard or soft rubber instrument intended to help keep the uterus in proper position or to bring it up into position. But since the uterus has no one proper position it becomes rather hard to find the usefulness of a pessary. The practical point, however, is this: a considerable number of women, for reasons unknown to me, are more comfortable using this instrument. I have again and again found a woman wearing a pessary which had not done anything whatever except erode the walls of the vagina, and which yet she clung to as giving her a comfort she could not get along without. No one can state what good the pessary does, but it can be stated that it certainly makes some women more comfortable. As long as this is so it will probably be used.

I object to the word "gynecologist" because I think

it sounds as if there were a legitimate specialty of that kind. I think there is a specialty, but not a legitimate specialty of that kind. We tend to look askance at people to-day who call themselves gynecologists, and very few physicians do, not nearly so many as ten or even five years ago. It is beginning to be felt to be a somewhat dubious word. It is parallel to the man who calls himself a stomach specialist. There never can be such a thing, because no human being can understand the stomach unless he understands every one of the other organs in the body so far as modern medicine can enable him to do; if he does, he cannot truthfully call himself a specialist.

That does not mean, of course, that a man may not give more time to the study of one organ than another man does, but it does mean that all surgeons should call themselves surgeons, their skill resting upon a general training, as well as upon a special training.

When women have borne many children, and sometimes when they have not, if they have been obese, the walls of the vagina become relaxed so that they hang down and protrude at the orifice. If it is the anterior wall next to the bladder, we call this a *cystocele;* if the posterior wall next to the rectum, we call it a *rectocele;* and the two practically always go together as minor ailments along with torn cervix and perineum. All of these ailments are often present in a single case.

In the vast majority of cases treatment of these con-

ditions is unsatisfactory. I know nothing I have seen more disappointment about than when a woman has been persuaded to go to a hospital and be operated on for the relief of these troubles, and then finds herself in just the same condition as before. I should not like to say that good cannot be done by operations for cystocele and rectocele, but I have never seen it done.

Then there is *prolapse of the uterus*, or dropping of the whole organ. It results from a weakening of the supports and ligaments of the uterus in women who have borne many children, who are generally obese, and have been on their feet a great deal doing hard work. The uterus descends toward the opening of the vagina and may actually protrude. This generally does no harm, but if there is actual protrusion there may be much inconvenience and some operation may have to be done. The operation for this is more satisfactory than for cystocele and rectocele, although I do not think any one can say that it is brilliantly successful, as the trouble is apt to recur.

Vaginitis, inflammation of the vagina, is practically always gonorrheal. In the adult it is practically always caught in the act of sexual intercourse; in a child — the vulvo-vaginitis of little girls — it is usually innocent, due to the same organism, the gonococcus, but usually in young children not to any fault on the part of the child. It is caught in such children in some way from their parents, perhaps through bed-linen, perhaps through sponges or towels. I do not think we know.

It is extraordinarily contagious from adult to child and from child to child; it is extraordinarily lacking in contagion from child to adult.

A child with vulvo-vaginitis in a hospital ward with other children, even though the greatest pains is taken to prevent contagion, often spreads contagion to the other children in very mysterious ways. But such a child practically never spreads that contagion to an adult, and this is often of importance in relation to the propriety of placing out such a child in a family of adults. So far as contagion is concerned, it is perfectly safe to place out a child with this disease with adults. It is not safe to put an infected child with other children. It may be impossible to prevent contact with other children, but we should do all we can to prevent it.

In the adult this vaginitis almost always spreads up into the uterus and tubes, with the results that I have already described, endometritis, salpingitis, etc. In the child it almost never does so spread; in spite of the enormous number of cases studied of late years, there are very few reliable reports of this disease spreading upwards and doing any harm. It is a local affair and not a serious one to the health of the child as a rule. This does not mean that it should not be treated, but that we need not fear any such results as we always fear in an adult. Children always recover with time, but it is sometimes a slow business.[1] They recover without treatment, but it may take years.

[1] See page 361.

Gonorrhea in older women is even more difficult to cure, and it is very difficult to say that one has ever seen a case cured as a result of treatment. We see its acute symptoms get well, often after a lapse of many months, but we seldom see it improve much faster under treatment.

Ovarian Disease. An enormous amount of disease referred to the ovary does not belong there. As soon as women begin to learn a little anatomy and to become conscious of pain in this part of the body they are apt to think there is something wrong with the ovaries. But the evidence of ovarian disease is very difficult to obtain until after operation, and in very few cases except ovarian tumors can we be sure of it. The self-made diagnoses of disease or pains in the ovaries are likely to be wrong. Most of the cases called ovarian are really matters involving the Fallopian tube, or the appendix, or the muscles of the abdomen, or the bones in the back, or something else that has no special connection with the pelvis.

Beyond any doubt the most important ovarian disease is *tumor*, for the ovaries are very subject to tumors and especially to *benign*, harmless tumors. These tumors are thin-walled, bladder-like affairs, full of a jelly-like, thick, syrupy fluid. In old times, when surgeons were less bold, ovarian cysts grew to enormous size before any cure was attempted — as big as a bushel basket. To-day we do not often see these tumors because they are operated on when smaller. They

are cured, so far as we know, only by operation, and there is no need of operation unless they are so large as to be inconvenient. As I have said, they are benign, they do not mean cancer, they do not have any serious danger to life, and may be let alone aside from the inconvenience of their size, and the pressure on the bladder or adjacent organs. Although they start on one side as a rule, they soon grow toward the median line and may fill up the whole abdomen. The symptoms are a sense of pressure and weight as described in fibroid of the uterus. Smaller ovarian cysts, the size of the finger end, are often found at operation for something else. They are harmless.

It is a very serious thing to take out both ovaries, — not serious to life, but serious to health, — and physicians are much more aware of that to-day than they were. Also the better-educated physicians are more aware of it than the less-educated. The ovaries used to be removed for a great many causes, but this is not so any longer. I have seen a good many women who have had this operation done for nothing more than nervousness — persistent nervous trouble which was attributed to ovarian disease, the ovaries removed, and the woman much the worse. The idea that troubles at a distance, backaches, stomach troubles, headaches, neurasthenic symptoms, might be due to disease of the ovary, was very prevalent at one time, and is to-day, I think, pretty nearly gone. Removal of the ovaries has a very different effect from the natural cessation of

their function at the "change of life." Many a woman is much stronger, healthier, happier, after the change of life than before, but I do not know that that can be said ever — certainly not often — of a woman in whom the ovaries are removed earlier. Of course they may *have* to be removed, but as a rule nervous symptoms, lack of control, lack of balance, are accentuated, not helped, by the removal of the ovaries.

I am saying this because women talk these things over with other women and with social workers, and ought to have some knowledge as to the consequences of this operation. Of course, if the uterus has to be removed, as in fibroid tumors or cancer, there is no particular use in leaving the ovaries and they are usually removed, too, but some men are doubtful even about that. To-day one finds every effort to leave one ovary or at least a part of one, because of its good effect on the general health. We are quite sure to-day that the ovary has another function than that of producing eggs. It has an internal secretion, i.e., a power to send into the blood, and through the blood supply to the whole body, something that the body needs. We do not know much more than that. We do know that the ovary has a very valuable function in preserving general health, and that we must not remove the possibility of that function unless for compelling reasons.

Malignant tumors of the ovary are rare, but have the same ominous prognosis and the same purely surgi-

cal treatment as malignant tumors anywhere else. No layman can suspect their presence.

Prolapse or downward displacement of the ovary is one of the minor gynecological ailments for which nothing should be done, which is the source of a great deal of meddlesome and harmful treatment. Inflammation of the ovary is very rare and unimportant except as a minor part of salpingitis.

Extra-uterine pregnancy. I said, in describing the normal process of pregnancy, that the egg might join the spermatozoon, become fertilized, take root, and go on toward the development of a child, not in the uterus, its proper place, but in the tube. That is not at all rare. It is what we call extra-uterine pregnancy or ectopic gestation.[1] A woman finds that she has some or all of the minor signs of pregnancy, which are, in the first place, the cessation of menstruation; in the second place, a morning nausea or vomiting extending from about the second to about the fourth month of pregnancy; in the third place, changes in the breasts, with enlargement and greater sensitiveness, sometimes darker color around the nipples. Those symptoms are the same in ectopic gestation as in normal pregnancy, but there come in addition sudden attacks of sharp pelvic pain, which may also occur in normal pregnancy but rarely do.

The diagnosis is difficult, only to be made by physi-

[1] *Ec* means out of; *topic* means place (*topos*); gestation or pregnancy out of place.

cal examination, and even then the diagnosis between extra-uterine pregnancy and pus tube is sometimes very difficult. They both produce many of the same symptoms and they do not either of them have a clear-cut, invariable picture. The fear that is entertained is that as the fertilized egg grows, it may burst the tube with sudden and sometimes fatal hemorrhage. In a person who has had symptoms such as I have described, an attack of pain accompanied by faintness, by great weakness, by pallor, which are the signs of hemorrhage, is very serious and calls for immediate skilful surgery if life is to be saved. But life can be saved in the great majority of cases by prompt surgery.

The surgeon stops the hemorrhage and removes the tube with the fetus. As a rule there are no bacteria concerned, no sepsis, and so, if the operation can be done promptly and no mistake is made, the patient may perfectly well recover and pregnancy take place in the normal way from the other tube.

We have no idea of the cause of tubal pregnancy, or method of its prevention. So far as we know it will happen once in so often as long as life goes on. A woman in whom such a thing has happened is a little more apt to have it occur again.

It is not the same as abdominal pregnancy (development of the fetus in the abdomen outside the pelvis). That is much rarer and usually is not recognized, since it is considered to be either normal pregnancy or a tumor.

The diagnosis of pregnancy, either normal or abnormal, is generally easy; occasionally very difficult. I have seen the best experts mistaken occasionally. The confusion is generally between pregnancy and some tumor, some other cause for enlargement of the abdomen, and with tumors sometimes there comes the cessation of menstruation because menstruation may stop from any cause that weakens the whole organism.

The Hygiene of Pregnancy. The *urine* should be examined every month and in the last half of pregnancy every week. The *blood pressure* should be measured at similar intervals. Varicose veins may develop in the legs and may need support by bandaging as described on page 81.

In most ways the woman should live and behave like other sensible women, with regular, moderate exercise, abundant sleep, plentiful, well-balanced diet, suitable recreation, and such occupations as favor tranquillity and self-forgetfulness. It is a mistake for a woman to treat herself like an invalid, but especially in the latter months horseback riding and other violent exercise should be avoided, — also falls and jolts of any kind, mental or physical.

In the latter months of pregnancy it is important that the woman should remember that she must eat enough to nourish her baby as well as herself. Extra lunches between meals or milk with meals is sufficient. It is customary to advise the drinking of six or eight glasses of water daily.

Regular visits to a physician should be made in the last half of pregnancy in order to forestall *eclampsia*, — the self-poisoning which results in convulsions, unconsciousness, and often death soon before or after the birth of the child.

Pernicious vomiting of pregnancy — and the result of self-poisoning — occurs in the earlier months as a rule and is simply an exaggeration of the morning nausea experienced by most pregnant women. Remaining in bed until after the first meal is taken, and remaining very quiet afterwards, nips some cases in the bud, but a physician should always be called upon to decide the diet and daily régime.

Severe anemia, toxic goitre, and insanity are other occasional complications of pregnancy. The rules of hygiene above given are usually all we can do to avert such dangers.

Disturbance in the function of menstruation. Menstruation is especially apt to stop soon after it has begun for the first time; that is, in girls who have just begun to have this function, it is apt to be irregular quite often for the first year or two before it is thoroughly established. This may mean no disease; simply fatigue or low condition from any cause. When menstruation has been established, it is apt to be checked by any great shock to the mind or by any serious disease of the body. I have known a good many immigrant girls whose menstruation stopped simply because they crossed the ocean, and perhaps because

they were homesick. If one is convinced that pregnancy and organic disease are absent, one can reassure such girls they will have no further trouble after a few months. The disease with which we are more apt to associate cessation of menstruation is tuberculosis, but merely because tuberculosis is the commonest of the serious, long-standing diseases to which a woman can be subject. Anemia (that is, the real thing and not the word which is often falsely used) is a very common cause for lack of menstruation, but one can say with confidence that menstruation will come back as soon as the anemia is overcome.

I have already spoken of pelvic tumors of any kind (or tumors elsewhere which are malignant) as causes of the cessation of menstruation.

There never should be any direct treatment, any pelvic treatment for a cessation of menstruation. There are two reasons why I put that so dogmatically. In the first place, it never does any good. If we are to restore menstruation, it must be by building up the general health and stopping the cause. Beyond that the attempt to restore menstruation is pretty sure to get mixed up with the attempt to perform abortion — with the attempt to kill the fetus when menstruation has stopped because of pregnancy. Any local treatment of the uterus when menstruation has stopped because of pregnancy is likely to result in the death of the fetus. Girls who know very well that they are pregnant every now and then will come to a physician

and ask for some local treatment in order to restore the menses, and now and then the physician is unwise enough or wily enough to do this. No physician likes to be called an abortionist, but a good many physicians make their living that way. The trade is an enormously profitable and thriving trade. There are places in Boston perfectly well known to the police, places called hospitals, where nothing else is done, and where with the aid of lawyers, it has been so arranged that no evidence of crime can be secured, so that nobody can be convicted of anything. It is a crime which, so far as we know at the present time, cannot be stopped. It will go on so long as people desire that it shall. No abortionist will ever admit such a thing, but among physicians it is generally pretty well known who's who in this matter, and it is one of the things which the public opinion of physicians never defends, — I mean the practice of the abortionist who does it as a regular business.

Now the question of when an abortion can be performed because of serious disease in the mother, — not because the mother does not want the child, — the question of producing abortion for the health of the mother, is one on which the Roman Catholic Church has taken a perfectly clear and definite stand, and on which the rest of the world has never taken any. The Roman Catholic Church has held that no matter what ails the mother, and no matter if you are perfectly sure that the mother may die, no interference with

the pregnancy can be attempted. It perfectly clearly faces the question of the death of the mother, and no exception is allowed. This has all the advantages of perfect clearness and definiteness. If a Roman Catholic physician did such a thing, he would be going contrary to all the canons of his Church, and I have never known a Roman Catholic physician to do it; I have known one to tell his patient to go to a Protestant physician. With Protestants it has to be a matter of trying to see what we think is right, and, as I say, there is a hopeless division of opinion on this subject. The vast majority, however, of Protestant physicians and of Protestant patients hold that the life of the mother is more important than the life of a single child, and that the child may well be sacrificed if that alternative is unhappily presented. Under these conditions a physician will always talk it over in the most public way, in order that the distinction from criminal abortion may be clearly made. By decent physicians the bringing about of a miscarriage is done only for the health of the mother, and only with the fullest understanding and publicity by every one concerned.

As it is against the law to convey to any one in this State information as to how this can be done, I do not propose to convey this information here. Probably most people already have this information or can get it. I do not myself think that law ought to be violated.

Abortion is sometimes a very serious matter for the

mother because of sepsis — blood poisoning — which takes place at the time. These things are not ordinarily heard of unless they get into the newspapers, but once in so often the uterus is poisoned, cocci are introduced into the uterus in the attempts to produce abortion, and puerperal sepsis, often fatal, occurs. If the trouble is recognized early the cleaning out of the uterus, the thorough removal of what is left behind after the abortion, is occasionally valuable and may save life.

Questions and Answers

Q. What about misplacements of the uterus?

A. I have said that the uterus had no one normal position, and therefore it is impossible to state that it is out of position. It cannot be out of position unless there is a single correct position.

Q. Why do some patent medicines bring relief?

A. In the first place, they may well contain powerful and useful drugs; for instance, iodide of potash, a useful drug in syphilis. But a much commoner and more important reason for the seeming usefulness of patent medicines is that most diseases get well of themselves, and if we happen to be taking a patent medicine, we may attribute it to the medicine. I do not think we can too clearly know that most curable diseases get well of themselves.

Diseases of the male generative organs. On the whole, male genital diseases are less frequent and less serious to the individual than are those of women.

Of course the commonest disease is *gonorrhea*. Gonorrhea in men attacks chiefly the urethra, the tube

leading from the bladder to the external world. When we say that a man has gonorrhea and say nothing more, we ordinarily mean that he has gonorrheal *urethritis*, or inflammation of the urethra. While gonorrhea may be innocently acquired by little girls, I think it is safe to say that it is never so acquired by males at any age. There are a good many tales of men who have picked it up from water-closet seats, towels, etc. I have not the slightest belief in them. I believe it is acquired in one way only by men or by boys. Morally, then, it is quite a different matter from gonorrhea in little girls.

In men it often gets well without treatment. For purposes of public health and to promote fear we often describe the consequences of gonorrhea as if they were *always* as severe as they not infrequently are. But it has to be recognized that the majority of all cases of gonorrhea get well without any serious inconvenience to the man himself; the serious inconveniences of the disease are to other people. It is for this reason that the false belief is prevalent that gonorrhea is an affair of no great importance. So far as the selfish individual is concerned, it is often not of great importance; it may not even lay him up at all. If it remains confined to the urethra, it causes burning and frequency of micturition and a discharge of pus, and nothing else. But it often does the same thing to the urethra that it does to the woman in the Fallopian tube, namely, closing that tube, partially or totally, so

as to produce what we call *stricture*. This is one of the serious results of gonorrhea in men. Often it is slight in degree, merely narrowing the tube without obstructing it, but it may suddenly shut down making an absolute obstruction, so that the urine cannot pass at all. Then the patient has what is called *acute retention of urine*, which is especially apt to happen in cold weather, and is very often due to this cause. There is another cause (prostatic obstruction) of which I will speak later.

Gonorrhea may go beyond the urethra into the bladder, causing cystitis, as I have already said in relation to the same disease of women. That is seldom serious in men. Its most frequent serious effect, next to the production of stricture, is due to its travelling up the tube which leads from the urethra to the testicle and affecting the epididymis, the upper portion of the testicle. This trouble, while in itself usually not very painful or very serious, goes along with the closure of the tube through which the spermatozoa come. The spermatozoa cannot then get from the testicle to the urethra and so cannot form part of a new life. Thus gonorrhea often causes sterility. It is in fact the only common cause of sterility in the male.

Gonorrhea in the male seldom travels any farther; it seldom travels up to the kidney, very seldom gets to any other part of the genital system except the prostate. The prostate gland, which encircles the urethra just as it leaves the bladder, may become infected, and

acute inflammation, or prostatitis, with or without abscess, may result.

Either in men or in women gonorrhea may jump to the joints, giving gonorrheal "rheumatism" as it used to be called, as we say now, *gonorrheal arthritis*. This is especially apt to stay in one joint or in one or two, as contrasted with true rheumatism which affects many at a time. A long-standing inflammation of one joint, if we can exclude tuberculosis, is most apt to be due to gonorrhea.[1]

I have said that in the vast majority of cases this disease causes the man no considerable inconvenience; he goes about, and soon thinks that he is wholly well. But the most terrible thing about the disease in its effects on the human race is its tendency to stay hidden and painless in the deeper portions of the urethra, whence it can spring up again and affect innocent wives. The man thinks he is cured of gonorrhea, but it takes a great deal of investigation by an expert physician to be sure. This is of immense importance, as I see it, to every woman in relation to the question of marriage. A certain percentage of men, no human being knows what, — somewhere in the vicinity of thirty per cent probably, — are infected with gonorrhea before marriage. They usually believe that they are over it. No woman should marry such a man without knowing that he *has* got over it — and that means an investigation, not by *any* physician, but by a phy-

[1] See p. 326.

sician especially trained for this particular thing, a specialist in genito-urinary diseases. Such an investigator is competent to tell a man once for all whether he is over his trouble or not. I think all of us ought to do what we can to spread this knowledge and to make people take these precautions. Such precautions are certainly taken far more frequently now than a few years ago. A good many men have begun to have some conscience on this subject, because for the first time they have some knowledge about it.

Gonorrheal ophthalmia, the extension of gonorrhea to the eye, occurs at the moment of birth, as the child is passing out of the mother's body — infection of the child's eye by the micrococcus of gonorrhea. Probably owing to the campaigns against it of late years, the amount of blindness resulting from this cause has been very much decreased. It never should be a cause of blindness, because we can very easily prevent it or stop its effects upon the baby's eyes. Proper obstetrics and the putting into every newborn baby's eyes of a proper antiseptic, will stop the disease in every single case. Later, if the disease has taken hold of the baby's eyes, vigorous treatment in a hospital will cure a great many more who otherwise would go on to partial or total blindness.

Enormously common in elderly men is the swelling of the *prostate gland*, which is at the outlet of the urethra, so that slight swelling, if permanent, is a great bother and finally a danger from obstruction to the

flow of urine. The prostate gland projects like a rock in the current, and finally blocks the current. It is one of the burdens to which men are subject, one of the few burdens that are really worse than those that women have — I mean one of the few that tend to even up the balance. What proportion of men have it cannot be accurately stated; a large proportion of men have more or less trouble late in life.

The obstruction first results in a stretching and a thickening of the bladder, and then in back pressure of urine up the ureters upon the kidneys. The obstruction produces continuous pressure upon the kidneys and by that the kidneys are gradually thinned out and their function diminished. Aside from these effects on the kidneys, which in the end are the most serious, the bother of this obstruction is very great in that it entails very frequent micturition day and night. Finally a great many men get so that they cannot pass any urine spontaneously; they have to draw it with the aid of a catheter, and have come to what is sometimes called "catheter life." When a man gets to that point he has to draw his urine altogether with the catheter. Operations are done nowadays successfully for the relief of this trouble, provided the patient is well enough in other respects, especially with respect to his heart, to stand the operation. Occurring as it does in elderly men the chances are considerable that the heart has been weakened by the arteriosclerotic processes to which all of us are subject as we get older, and the

strain of the operation may be serious. If a man's heart is in good shape and if a competent, skilled expert is obtainable, the operation should be done and is done an enormous number of times with very great relief. At the same time five to ten per cent of patients die under the operation, partly because it is not skilfully done, but more often because the condition of the heart is not estimated at the beginning.

Another condition often spoken of as a disease of the male generative organs is *varicocele*. Anything that has the word *cele* means that it conceals or shuts in something. A *hematocele*, for instance, is a cyst or sac where blood is shut in. A varicocele is a sac in which distended veins are shut in. Varicocele is the shutting-in of a bunch of distended veins in the groin and near the testicle. I want to emphasize the fact that varicocele is not a disease at all, because countless unfortunate individuals spend their money and risk their health in unnecessary operations for a thing that is not a disease and is merely a peculiarity of no importance.

Before leaving the subject of the genital system I want to say a few words on a matter which does not strictly belong here, — the much-disputed subject of birth-control. In the first place, there is no authoritative medical opinion on that subject. It is not primarily a medical question, but an ethical one. Nevertheless, the doctor's opinion is very often asked. I am not giving, therefore, any authoritative medical view — I am simply giving my view.

By birth-control is usually meant the control of birth by artificial means; that is, by means other than the remaining apart of the sexes. I am opposed to birth-control in that sense: first, because it is contrary to law in this State. Not every law deserves absolute obedience; some laws about Sunday, for instance, are left on the statute books merely from carelessness. But if any one made the attempt to repeal this law regarding birth-control, I do not think they would get thirty per cent of votes. It is a law which public opinion supports. Therefore, if we violate this law, we are violating our unspoken oath of citizenship — the oath we never took, but which applies to us. When we get beyond legality we enter a field where there are countless opposing standards. There is the standard of world-politics: world-politicians tell us that we must not check births, because we need more citizens to defend the state against attack. Economists of the Malthusian type of mind tell us: "You can't afford so many children, and so they should not be born." The eugenist says: "The more children in a family the weaker the children are." But there are two opinions on this — the better opinion, I think on the whole, opposing the belief that *when other conditions are the same*, large families give the state weaker children than small families do. I think that we get into a perfectly hopeless muddle of conflicting standards if we take any other than the religious point of view here. The only way the matter can be settled is by asking

what is the best for the human spirit. Anything which is so contrary to nature as an artificial control tends to split body and soul apart, and to make a great and sacred function a very cheap affair. On religious grounds, then, and on the ground of obeying the laws, I personally am wholly opposed to the artificial control of births. I think I know every argument that has ever been brought upon the other side. I have taken part in a great many discussions and have read all that I could find in favor of artificial birth-control, but I think it is not convincing.

Septic Peritonitis. From time to time *peritonitis* has been mentioned in these pages as the result of perforation of the appendix, the gall-bladder, the stomach or duodenum (peptic ulcer), the intestine (typhoid ulcer), or the Fallopian tube (salpingitis). If the perforation occurs slowly and gradually, adhesions form about it and wall in the virulent bacilli so that they cannot spread through the peritoneal cavity. This *local peritonitis* is usually not serious, though the adhesions may later bother the adjacent organs in their work.

But if perforation occurs rapidly the inflammation spreads throughout the whole abdomen, producing *general peritonitis* and paralysis of the intestines. This paralysis allows poisons to be formed and absorbed in the intestines, just how or why we do not know. These poisons absorbed into the blood produce death.

The symptoms of general peritonitis are tenderness and rigidity of the whole belly wall, obstinate constipa-

tion, fever, vomiting, rapid, feeble pulse, and often hiccup. Death usually follows in a few days, but repeated washing of the stomach (to clear out poisons) and the constant administration of water by the rectum so as to make up for the fluids vomited or siphoned out of the stomach, may save life.

Tuberculous peritonitis is a wholly different and vastly milder affair. It occurs especially in children and young adults and is twice commoner in women than in men. It produces a gradual, nearly painless, enlargement of the abdomen with moderate fever. Children often do not feel much sick and complain little. In America it is especially common in negroes, also in Italians, Greeks, and other recent immigrants from Mediterranean countries.

It produces a long, tedious, but not painful illness with considerable prostration in adults; but if there is no discoverable tuberculosis in other organs, about one half the cases get well with or without operation. Whether operation helps or not is still an unanswered question.

CHAPTER IX

DISEASES OF THE NERVOUS SYSTEM

THE diseases of the nervous system include diseases of the brain, diseases of the spinal cord, diseases of the nerves as they run outside the spinal cord in the arms, legs, and body — what we call the "peripheral nerves" — "peripheral" meaning at the surface of the body. Nerve disease also includes a good many diseases without known pathology. When we do not know where the trouble is or in what organ it resides, we are apt to suppose that it is connected in some way with the nervous system. That last group includes most of the insanities and miscellaneous other disturbances involving conspicuously the field of nervous action.

I shall begin with *the disturbances of mental life.* These belong in four groups, each more serious than the last in the order in which I give them. The first deviation from normal might be called "moods"; the second, "psychoneuroses"; the third, "psychoses"; and the fourth, "insanities."

To *moods* which I do not suppose we can say are wholly normal, practically the whole human race is subject. There are very few people who can say they never were blue in their lives, very few who can say they never lost their tempers. At the same time, if

those moods are continued and intensified, they would merge into other and more serious groups. Hence they must be recognized as connecting all of us with those more serious mental diseases and making it comparatively easy for us to understand them. A person of very intense passions may kill, for instance, in a fit of passion, and then the question always arises as to whether he was sane or not. I think it is wholly wrong to assume that merely because a person does some fearful act, like homicide, therefore he is insane. I think we all have homicidal moments. Moods, then, are not generally taken as a part of a disease, unless habitual and very extreme in degree.

Psychoneuroses, the next group, may also merge indistinguishably into health. Almost any one, if run down as a result of any disease or of no disease, may be psychoneurotic, or, as we used to say, neurasthenic, for a few days or weeks. Bring pressure enough, pressure of starvation, pressure of terror, of worry, of disease, and almost any one will be driven beyond the normal to what we may call a psychoneurotic state. It is more than a mood because it is more permanent. There is nothing that I resent more than the attempt to arrange the whole human race into two classes, psychoneurotics and others. We may some of us be fortunate enough to escape such states for a considerable portion of our lives, but we have no reason to look down upon anybody else who does not so escape. *Psychoneurotic states we all have off and on, but when*

such states are permanent it is a different matter. That is disease and we call it a *psychoneurosis.*

The psychoneuroses, in my opinion, are always inherited, congenital states, something more than a symptomatic and temporary disturbance. When without any temporary physical cause a person has the symptoms which will be described presently, then I believe that a careful history will always show that the trouble goes back to childhood, and that there have been traces in that person from the earliest time, because the tendency was in his blood. This does not mean that a psychoneurosis is not curable, but that the patient will have to fight it, as he might have to fight tuberculosis, as long as he lives. Psychoneurotics are curable, but eternal vigilance is the price of liberty from psychoneurosis as from tuberculosis.

I am entirely convinced that hard work, whether mental or physical, never produces a psychoneurosis. It may make a person run down, feel poorly, and behave queerly for a short number of weeks, but there is no commoner fallacy than that overwork either of mind or body produces a psychoneurosis.

(1) In the first place, a psychoneurosis means oversensitiveness, in every sense — *oversensitiveness* to noise, to smell, to having the feelings hurt, to changes in surroundings, to reproof. Perhaps it is only the same thing to say that in the psychoneurotic emotion is *not controlled* to the extent that it is in other people. Emotion dominates.

(2) *Self-centredness.* Partly because these troubles last so long, it is almost inevitable, as in some organic diseases also, that a person should become more or less *self-centred.* A person with hip disease or cancer may get self-centred because through isolation and idleness he has been driven in upon himself. The psychoneurotic has merely the self-centredness of the average chronic invalid. There are some chronic invalids and also some psychoneurotics who are not self-centred, but it always seems to me heroic when they succeed in maintaining themselves free from self-centredness.

We can divide the psychoneuroses into five groups: (1) the neurasthenic type, (2) the hysteric type, (3) the psychasthenic type, (4) traumatic psychoses, and (5) the visceral psychoses.

There are no hard-and-fast lines between these types. They run into each other. Any patient may have three or four of them in a lifetime, one shifting to another according to circumstances. Nevertheless, they are worth distinguishing.

The *neurasthenic* type is so named from words which mean *weakness of the nerves.* The nerves are really never weak; they are merely telegraph wires which transmit messages. But we use the term for patients in whom fatiguability, *pathological fatiguability,* is the most prominent symptom. We distinguish this disease from ordinary fatigue — fatigue with adequate cause. As a rule the neurasthenic has not been doing hard work either of mind or body for years. It has

often been said, I think truly, that these persons were born tired and have been getting more so ever since. If that is said without any sense of superiority or of cynicism, I think it is true. The only thing which will rest them is work. One neurasthenic has a weak back and cannot use his muscles; he is tremendously easily fatigued in this respect. Another cannot hold his attention or cannot carry on a conversation.

Characteristic, then, of this whole type is weakness, weakness of every type. Of course the diagnosis can never be established save by the most rigid physical examination, excluding all known physical causes. A man with heart disease, tuberculosis, peritonitis, cancer, arteriosclerosis, brain syphilis, may present the same symptoms as the neurasthenic, and yet physical examination may show that he is as far as possible from being a neurasthenic patient. We then begin by excluding, through a prolonged, searching examination, all discoverable organic disease. It is still open to any one to say, "There is a disease there, but you have not yet found it." But many *post-mortems* have been done on such people without anything being found.

The *hysteric* type, I think, is the rarest of the five. It is a long time since I have seen a case of pure hysteria, the type in which one tends to have seizures, paroxysms, fits of one or another kind. In the novels this is shown by fits of laughing and crying. In real life laughing and crying fits are not nearly so common as a sudden unconsciousness under conditions which soon

convince us that we are not dealing with a true faint. I was passing an apartment house one day when some one opened a window and called, "Come in, quick!" I found in the lobby a very large, agitated hotel manager and a lady whom I knew. The patient was lying on the lobby floor, and the manager was very indignant because she was messing up his hotel. I felt the patient's pulse and found it going steadily and strongly; hence there was obviously no immediate emergency. Then I looked at her face and found that her eyelids were trembling and twitching. You can say, I think, without fear of contradiction, people never have that when they are in a fainting fit. Fainting means absolute relaxation. The fact that the eyelids were trembling made pretty clear to me that it was not a faint. Again, when I took hold of the patient's pulse the hand of the patient came over and spasmodically gripped my little finger. Then I was pretty sure of the diagnosis, and to test it still further I applied a fitting stimulus, such as will bring an hysteric out of her fit. In old times throwing a bucket of water was the accepted treatment. This seems rather unnecessarily cruel. Modern methods are kinder and quicker. I turned to the hotel manager and said, "Will you please send for the Boston City Hospital Ambulance?" Then the patient at once sat up and said she could n't stand going to a hospital.

After reading a story like that it is very hard for us to avoid the impression that the woman was simply shamming. But, in truth, she was not enjoying herself at

all. It was not "pure cussedness" — I beg you to take it on authority that it was not so. A person does not do this sort of thing for fun, and yet he has no acute organic disease and can be roused into the full possession of his faculties by proper stimulus. I believe that the will is not in a condition to be appealed to; the will is in abeyance. We can understand it by adopting Janet's theory of these states, which is that they are in fact a strange sort of *forgetfulness*. The hysterical person exemplifies a type of very extraordinary absence of mind. We can all do very queer things when we are forgetful. You are facing an audience and suddenly you become stage-struck and cannot remember in the least what you meant to say, what you are there for, nor even what your name is. You are not organically diseased, not paralyzed, neither are you doing this thing for the fun of it, but you cannot get out of the state until you somehow get the proper stimulus. In my case the proper stimulus is my notes. If I find myself in absolute forgetfulness, my mind a blank, I apply the proper stimulus, my notes. No exercise of my will can do it — I am only able to hitch myself to the proper stimulus.

The hysterical person, then, suffers from an extraordinary kind of forgetfulness. He may forget, for example, how to move his right arm. How do you move your right arm? You cannot move your ears; some can. You have forgotten how to move your ears. Animals all know how; but we have lost that portion of mem-

ory. We have perfectly proper muscles to pull the ears as a horse can, in three directions. The hysterical patient for the time has forgotten how to move his muscles. He can be reminded, however, by shocks which "bring him to himself," as we say, by healing this split in consciousness which is forgetting. A peculiar type of hysterical psychoneurosis is the exaggeration of our ordinary *multiple personalities*. Personalities can get split up into pieces; it happens to all. We all have a tendency to be multiple personalities, and the more attention we pay to it the more we have. A person talking French, for example, is quite a different person from the same man talking English. It is not merely that he is using different words; a wholly different side of his soul comes up. A person playing baseball is a totally different person from his ordinary business self, and a person practising medicine can for a time forget his duties and obligations in other directions. There are half a dozen people within every tenement of clay, and one should not get excited over these cases which we read of in textbooks. The most important case of the kind was Dr. Prince's "The Misses Beauchamp." [1] The Misses Beauchamp are one lady. By paying a great deal of scientific attention to the moods of this lady, Dr. Morton Prince convinced himself that she was several people. Dr. Janet when he was here told me that he thought at that time she had

[1] Dr. Morton Prince, *The Development and Genealogy of the Misses Beauchamp*. London, 1901.

five personalities, and added, "She will have more if Dr. Prince keeps on studying her." We should not take these things too seriously. It is perfectly possible to split one's self up into as many personalities as we have time to, and attention intensifies the unfortunate separation.

Hysterical tumor is a very bad term. It means a tumor that the doctor has not found any cause for, and it disappears about the time another doctor gets there. It is usually an accumulation of gas in the stomach or intestine which is so tense that it appears like a solid body, and yet under ether relaxes. It is better called a "phantom tumor."

Questions and Answers

Q. What is the cause of hysterical fainting?

A. The cause of the fainting is that the person forgets how to exercise that control of himself which keeps him in touch with reality. People in a brown study may entirely forget the outer world; carry it a little farther and you have a person in unconsciousness, merely by pushing a little farther what happens to all of us. None of these things are so extraordinary as they seem.

Q. Is the blindness that so many of the soldiers are suffering from hysterical?

A. I suppose so. From what I have been told by army physicians, it seems to me that that belongs in this group.

It is an enormous subject, this subject of hysteria, but for us important only to this extent. The thing is not "pure cussedness" and not organic disease, but belongs in an extraordinary limbo between those two. It is a queer kind of forgetfulness or mental split of which every one of us has had a mild example whenever we have been stage-struck or shy.

Psychasthenia refers to states in which there are no special weaknesses of muscles, no special fatiguability, no special forgetfulness, but in which the whole trouble works itself out in the field of mental life. The word means weakness of the soul — weakness of the mental life; it is there rather than in the muscles or internal organs that the trouble shows itself. The typical psychasthenic is the person who is dogged by *fears* of one kind or another. When mental life is below its normal level of heat and energy, fears break upon one. It is weakness, then, that leads to fears. Perhaps an autobiographical example will bring this home. I was brought up in the country before the age of telephones, and I used to be sent after dark on errands to one of my cousins' houses about a mile off. Of course, like any child, I was not going to acknowledge that I was afraid of the dark; nevertheless, these were occasions of terror. But I noticed that there were certain times when my fear of the dark did not bother me. If just before I started on my errand I had been playing the violin or doing anything pleasant, I could carry the heat and energy of that music along with me so that I had not time to be afraid. My mind was so active that terror could not creep in. It was when energy died out and I was tired and cold that the fear could creep in. Keeping the mind so full of active ideas that fear has no time to get in is the way to keep it out.

The psychasthenic is tortured, not only by fears, but by a sense of personal inefficiency. When a person

who certainly can do a thing is suddenly, or not so suddenly, convinced that he can't, and gets so that he gives up doing things which he perfectly well can do, he belongs in this same field. Making up his mind is sometimes one of the things which seems impossible to him. He is abnormally diffident and self-reproachful.

The *traumatic* type of psychoneurosis is of great importance to us in relation to working men's compensation, or compensation for any class of persons. These psychoneuroses used to be spoken of as *railway spine*, because a great many people after a railway accident get troubles which are referred to the spine. It could perfectly well be "railway head" or "railway stomach"; the only point is that it has some relation to an accident. Rigid physical examination shows that there is nothing the matter. The person genuinely believes that there is something the matter, and cannot get rid of that belief. Unfortunately the whole issue is clouded by the effect of money and litigation. The lawyers on the side of the company are, I think, genuinely convinced that the patient is merely shamming and that he will continue to suffer until he gets money from the railway. Then he will cease to suffer; it is an extraordinary coincidence. We need not always interpret this in a cynical sense. The effect of the excitement and anticipation connected with the lawsuit, the hopes and apprehensions, are sometimes enough to upset any one who is congenitally oversensitive or psycho-

neurotic. When the suit is settled, even if it is settled against him, he is better.

Recently I saw at the Massachusetts General Hospital a most extraordinary example of what I am entirely convinced is a traumatic neurosis. A man in the course of his work got some injury to his wrist — I did not learn exactly what. Some time afterwards one of his fingers was found to be shut tightly into his palm. He is now getting damages on the basis that the injury caused the finger condition. It is almost impossible, for anatomical reasons, to see how this finger alone could be affected in this way. However, when we gave him ether the whole thing came out straight, which proved, I think, that it was hysterical or a traumatic neurosis. Yet he is getting large amounts in damages because there is supposed to be disease in his hand. The finger contracted again when he came out of the ether. The lawyer for the defence will say it is all shamming. I do not think so. I believe that the patient really thinks he cannot do anything with that finger and has formed the habit of keeping it shut in on his palm.

Visceral psychoneuroses are those which refer to one or other of the internal organs. The gastric neuroses, the cardiac and the pelvic and so on, mean that a person somehow or other applies all his characteristic fears and emotions to one organ — he comes to believe that his stomach, for example, is incurably diseased, and then he cannot get his mind off that stomach. I have often spoken of these things as a dislocation of

consciousness. Consciousness is meant to go on without any attention upon the functions of our bodies. Our stomachs and our hearts and our lungs are meant to do their work without any help, and to become aware that we have a stomach or a heart is the greatest misfortune. As a bone becomes dislocated, so consciousness gets out of place and it is very hard to get it back. Some temporary upset calls a person's attention to his stomach; he gets the idea, perhaps from something that the doctor has *not* said, that *he* is very much alarmed about the stomach. Then the patient broods over the fear that the doctor does not dare to tell him how bad it is. Out of that comes a disease, a habit of mind, which will render a person as thorough a sufferer as any you can see. In diagnosis we must first demonstrate by the most thorough physicial examination that there is no organic trouble anywhere and then begin a course of training directed to lead the patient's mind in other directions.

These visceral psychoneuroses are very common, much commoner than any others that I have mentioned. The medical profession has a considerable part in forming them. We doctors sometimes quite unintentionally direct the patient's attention altogether too much upon one or the other of his bodily organs. All hygiene has this danger. To be conscious even of our health is, I think, a diseased state. We ought to be thinking about our job and not about our health or our diseases.

Half of any general practitioner's ordinary work is concerned with some type of psychoneurosis; not half that the neurologists do, but half that all of the doctors in the country are doing to-day, is to treat psychoneurotics. That is important in many ways. It seems to me most important, because very few of the doctors have ever been trained to treat a psychoneurotic; very few have any interest in it. The attitude of many a doctor is expressed in his desire to run out the side door when one of these patients appears at the front. He hates them, but cannot afford to show it. Yet nobody will help this type of patient who does n't feel a very keen interest in him, and find the disease fascinating as a study of character only slightly removed from what every one of us has.

It has often been said that this disease is increasing, but we have no statistics on which to base any such statement.

The treatment of this trouble is real life. In one way or another these people have usually been shunted off to a side track, partly through invalidism and lack of contact with their fellows, and partly through lack of money. Hence the treatment is real life, in the sense of doing whatever one can to get the person back into normal relations with human beings, with duty and with God, which keep the whole of us going. No one can realize how much we are all of us kept not only happy but healthy, how much our stomachs and hearts as well as our mental life are kept going, by the normal

ties to the world. That is the general formula. In every case there are a hundred different things to be said, but I have said most of what I mean in a book called "What Men Live By." To help a psychoneurotic we attempt to bring him, in whatever degree we can, — often a very small degree, — into touch with the great forces by which well people keep well. Of course this means that I am entirely opposed to sanatorium treatment, to sending people abroad, and putting them to bed. I think these are the most tragic mistakes in the world. "Rest" in bed may have a place when a person is frantic or dazed, but only until we have time to turn round and see what is the next thing to do. No matter how weak the psychoneurotic is, he must use the little power he has in order to get more. If a person has very little muscle on his legs, he must exercise that little in order to get more. Patients often say, "I cannot read halfway down a page before my attention is tired and I forget it all." I always urge such people to go on reading, and lead them to see that only in this way can they gain the power to read the page and then to read more. *They must do the thing they "cannot do"* — do the thing they are afraid to do — get where by contact with other people they forget themselves and find the normal centre, instead of the abnormal centre, for life.

I have talked about work, but I do not think anybody was ever cured just by work. They must play, too, they must get their affections straightened out,

and find their own relations to God before they are ever proof against the re-attacks of this trouble.

The *psychoses* are the next most serious group of the mental troubles. By far the commonest of them is the so-called *manic-depressive psychosis*. Like the last type, I think this has a close relation to heredity, although we know very little about it. This doesn't mean that it comes from parents who had just the same trouble, but that there is some definite hereditary taint (alcoholism, insanity, criminality, phthisis) to be found in the stock of the vast majority of patients. The word *manic* means excitement; it does not mean at all what we think of when we think of the traditional maniac. Harvard boys after a successful football game are in the typical *manic* state. *Excitement*, then, is one half of this disease; *depression* in the ordinary sense, but intensified, is the other half.

In the sharpest possible contrast with psychoneuroses, which run through a person's life until he comes to terms with them, the manic depressive psychosis is a self-limited disease, with a beginning, middle, and end, like typhoid or pneumonia. It comes at a certain date and it lasts in spite of anything we can do for a certain period; then it stops, not because of, but in spite of, anything we can do at a certain time, and the person is perfectly well. These attacks tend to recur. I have known people who had only one, but in most cases the depression and excitement come again

and again so that it has been called "circular disease of the mind," even sometimes "circular insanity." The fundamental fact is, it recurs. It has an extraordinary tendency to come in the autumn and early winter months, and go off in the early spring.

The two phases can be described in further detail. The depressed phase is usually the first, although it is the second in the title, and it often comes without the other phase appearing at all. This phase often gets split off and constitutes the whole of the disease; that is, a long period of intense depression is the whole thing. It differs chiefly in degree and in pertinacity from the ordinary fit of the blues. Most of us have no occasion to analyze a fit of "the blues" and see how abnormal it is. In "the blues" we feel that there never was a time when the world looked any better than it now looks and there certainly never will be such a time. That is a characteristic of all abnormal mental states, and not particularly of this one; it is also characteristic of moods, so that we can all verify its characteristics in our own experience. In winter it is hard to remember that we have ever been too warm, and in summer we cannot believe that we have ever been or ever shall be cool. When we are thoroughly blue, we are quite sure that we were never of any use. Moreover, we are quite sure that our friends do not like us.

Intensify all that and we have the depressed phase of this trouble. Self-reproach is intense usually in this trouble; and the person reproaches himself for things

he never did, to an extent that would be ludicrous if it was not so pitiful, so out of proportion to the peccadilloes that may have been in his life. I sincerely believe that we are all of us "miserable sinners," but the person who has a manic-depressive psychosis is abnormally conscious of this fact and blames himself, not only for trifles, but for sins which he never committed.

Some of the symptoms that make us know that this is a disease and has nothing to do with character are physical. On the physical side, menstruation in women stops often only to reappear at the end of the trouble. Again, all muscular motions are often very slow; people get stuck in a fit of brooding and think they cannot move. I have had a man come into my office and sit down and at the end of my interview there he still sat. There was no prospect of his going anywhere. An hour later there he was still sitting. He had no desire and no initiative to move elsewhere. I have seen that same unfortunate individual stuck on a street corner. With the running-down of the whole organism the initiative for motion goes, and especially in the morning. The difficulty in getting dressed in the morning (which some of us may have at some time experienced) is intensified exceedingly. Patients feel as if they could never get going. Their spirits and their bodies are alike at their worst in the morning and their best in the evening. They may feel somewhere near decently well in the evening. Their very worst and blackest moods are when they first wake. That shows

the physical side of the thing and suggests how little it has to do with character.

This depression goes on for a variable number of weeks or months, and then begins to turn into the other type, the manic phase, or perhaps disappears without any manic phase. The *manic phase* begins with a lack of concentration, with a lack of responsibility, with a flightiness which is cheerful. The person cannot keep at anything; he jumps from subject to subject and from task to task. [Of course we have his normal self to contrast this with. We are not forgetting that people differ enormously in their capacities for concentration.] After this the patient may go on to excitement in which he is perpetually and on the whole excessively happy. It does not seem possible that a person can be too happy, but these patients are happy in a way that makes them practically incapable of thinking or planning. Their happiness drives out every other activity of the soul. They are so happy that they do not do anything steadily nor carry out their plans.

They are abnormally affectionate. A great many mistaken engagements of marriage take place in this phase. They love everybody, which is good, but they do not moderate their transports or make distinctions between one person and another. They are often a little queer about money matters and spend extravagantly in this phase, for they are very apt to be in error as to their own capabilities and resources, not only pecuniary but others. They recognize how extraor-

dinarily handsome, strong, successful they are, and sometimes their fellows do not recognize it. They talk a great deal and are always in the front row of every conversation. They may seem really better and brighter than their normal selves in many respects, and so they are, perhaps, but they cannot keep it up. Moreover, in many ways they are foolish or deficient. It is very hard for these people to keep still. I have said that the other type of person comes to anchor, as it were, and stays so. But in the manic phase, it is almost impossible to make the patient keep still. There is perpetual activity, no sense of fatigue; he cannot get tired, does not need to sleep. But he exhausts himself at this time, and it may take a long time to make up for the drain of ceaseless, untiring activity.

Throughout the whole thing the person is rational. You can make him see the whole trouble. He is not insane. He can be brought down to earth and will take proper care of himself under advice. But there is always danger that the trouble will become so intense that it merges into insanity with suicidal impulse. In the severer cases confinement or perpetual watching is necessary to prevent suicide.

We have no treatment for the manic-depressive psychosis. Nothing we do makes any particular difference. When a normal person is a little blue, if you take him to the theatre it may cheer him up, but in this psychosis an attempt to entertain may make him more miserable than ever. He weeps at the thing that

amuses us, so that the ordinary efforts to cheer him up do not apply here. We can do nothing much more than wait until the severe phases pass. I think myself that it is much like seasickness. When a person is thoroughly seasick, nothing makes the slightest difference, but as soon as he is over the worst of it, then what he does and what we do make a great difference. So with these manic-depressive sufferers; the time that we can be of use is in the milder early stages and in the late convalescent stages. Then by the same efforts that we make in the psychoneuroses, by the attempt to draw the patient into normal relations with the life and people around him, we may help him. Medicines have no effect, of course, in this disease. The worst thing that anybody can do is to give a sleeping-potion, which adds a drug habit to the troubles already in existence.

Questions and Answers

Q. Is this disease something that is easily recognized as abnormal, or might it go on and not be recognized?

A. It may easily go on and not be recognized.

Q. Do you think it is chemical in origin?

A. I think the evidence will probably show some day that it is chemical; that is, that there is something wrong in the chemistry of our bodies whereby poisonous substances accumulate, poison both body and brain, and then are finally worked off. There is no proof of that, however, as yet. A great deal of chemical research has been devoted to an attempt to prove it, but it remains a plausible hypothesis.

Q. What is the best method of persuading them what their duty should be?

A. I know no definite way.

Q. What if they show violence?

A. If it is really violence, then we have crossed the border into insanity. Most patients are perfectly reasonable, but at any time this disease may cross the border into a region where you cannot reason. You can imagine a person being so exuberant during the manic periods that he has to be restrained. Then it is insanity. At the other extreme, which is commoner, people get so depressed that they are suicidal. The distinction between sane and insane is always a purely practical one — What does the person do and how far is he amenable to reason? When a person gets beyond any rational control, even though his symptoms are the same as before, then he is insane.

Q. Do emotions bring about this disease?

A. All of our emotions change the chemistry of the body. It has been proved by Dr. Cannon,[1] that fear, anger, excitement, and probably every emotion has a perfectly definite effect upon the body, pushes sugar out of the liver and into the blood, stimulates the suprarenal glands, affects the coagulation of the blood, etc. In the manic-depressive psychosis I think it is the other way. Chemical changes beget emotions. Body and mind act each upon the other and each may be the initiator; so that the mind can bring about diseases of the body as Dr. Cannon showed. But the body can also bring about diseases of the mind, as in syphilitic insanity.

Q. Has anybody studied this psychosis as dementia precox has been studied?

A. I should say yes. There has been a great deal of work done at the McLean Asylum in that line, but so far without any success. I do not as yet feel convinced that we are really doing anything for the cure of dementia precox. I think we shall have to wait a good while for it.

[1] Dr. Walter B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage.* New York, 1915.

Another much less common psychosis goes under the term of the *exhaustion psychosis*, and is seen especially at the end of infectious diseases. Once in so often, in every hundred cases of typhoid or pneumonia or even tonsillitis (as I have seen), there comes a psychosis which must be due in some way to the effects of the poisons of the disease. (This tends to make us think that the other psychoses are also due to poisons.) The exhaustion psychosis is shown particularly by a bewildered state; the patient is not much depressed, not much excited, but very much bewildered or disoriented, which means, literally, that he does not know the points of the compass. The patient does not know where he is; he has delusions or false beliefs, and hallucinations (false sight and hearing, false smell and taste). If I believe that you are the devil incarnate, that is a delusion; but if I believe that I now hear a bell ringing loudly, that is a hallucination. Hallucinations are strictly sensations, hearing, sight, taste, smell. Hallucinations of taste and smell are very common; people very often think their food is poisoned and fancy they can taste the poison.

The most important fact about this exhaustion psychosis is that the patients almost always get well and stay well. One feeds the patient, keeps him as quiet as possible, and in a little while the trouble passes off, in a few weeks possibly. It has no tendency to recur.

In all I have said so far I have been pretty negative so far as treatment is concerned. I do not think there is any treatment for the psychoses. I do not say that there never will be, but so far there is none. One does what one can to mitigate the symptoms, to palliate suffering, but one does not treat the disease. There is no mental treatment. We try to get the bowels regular, to keep the skin in good condition, to promote sleep, but we have given up trying to affect the mind itself, because we cannot. The mind comes round to health, if it can come round, as a result of treating the body.

The only other psychosis that should be mentioned is the psychosis of the *puerperal state*, coming before or after the birth of a child, probably very close to the exhaustion psychoses, certainly due to self-poisoning of some kind. It is usually of the same type as the exhaustion psychoses, but there may be depression with it, rarely excitement. Its prognosis is usually good, but it may recur with the next child. It is facts like these, facts like the relation of psychosis to pregnancy and to acute fevers, that make us believe that there are no diseases of the mind. There are, we believe, diseases of the whole person, body and mind, but no diseases of the mind. The alcoholic is diseased in his body and his mind; the typhoid patient is diseased in his body and his mind (delirium); but they have not a separate disease of the mind itself.

CHAPTER X

DISEASES OF THE NERVOUS SYSTEM (CONTINUED)

I. Moods	
II. Psychoneuroses	Neurasthenic
	Hysteric
	Psychasthenic
	Traumatic
	Visceral
III. Psychoses	Manic-depressive
	Exhaustive
	Parturient
IV. Insanities	Precocious dementia
	Syphilitic dementia
	Senile and arteriosclerotic dementia
	Paranoia
	Alcoholic insanity
V. Mental Deficiencies	

INSANITY cannot be defined. I was glad to hear that restated recently at the State House by Dr. Elmer E. Southard, who has a right to speak on this subject. Patients are treated and legally committed upon the basis of practical considerations, and not of scientific definitions. One says, "This person is dangerous to have in the community." We may be all insane, but most of us are harmless; we do not make much trouble in the community, so that it is not worth while to commit us. But when we pass that point and begin to make trouble, we begin to be called insane.

The insanities are diseases of the body and mind together, not of the mind separately, so far as any one

knows at the present time. I dwelt in the last chapter upon two great contrasted emotional states, excitement and depression. There is a third great emotional state which is contrasted with them both, as *indifference*, profound lethargy or inactivity, emotional neutrality. That is the main characteristic of the state known as *dementia*. Whereas in excitement one has a very high, keyed-up state, and in depression a very sad, depressed state, in the demented states people are simply profoundly indifferent. They sit like a bump on a log, and look like the farmer who said when there was nothing to do in winter, he would "just sit and think, and sometimes just sit." Literally they may sit for months and years and vegetate, free from any emotion of happiness or unhappiness, purely animal or vegetable creatures. A great many other insanities tend to dementia as their end-state. They are split off into various active and dangerous forms, but end in the purely passive, inert, unemotional indifference, mindless dementia. "Dementia" means literally mindlessness, the absence of any mental activity at all.

There are three great groups, dementia precox, syphilitic dementia (which has various other names, to be given later), and the senile, or arteriosclerotic form.

Precocious dementia, or *dementia precox*, is one of the best studied types of insanity. It forms a steady and considerable percentage of all the insanities in asylums and presents a great many mysteries. In contrast with the excited and depressed states, the patient with

dementia precox is usually neither excited nor depressed, but fundamentally silly. He can easily be forced to reason if you can break through his habitual silliness. The disease comes on usually in the early adult life, at college time, at the time from eighteen to twenty-two or a little later, and it seems as if a person's mind, after developing up to a certain point, stopped and retrograded as we are accustomed to see it in old age. That is why it is spoken of as "precocious," the process which is natural in old age coming on in a very unnatural way in youth. One does not make this diagnosis in elderly people because then it is not precocious.

I have spoken of silliness as one of the characteristic marks; another is repetition, a stereotyped way of saying the same things over and over; certain motions, gaits, attitudes, which become habitual. If one walks through an asylum one often sees people sitting or standing in very queer attitudes.

A third characteristic is resistance to whatever is said or desired. They often won't eat, walk, go to bed, take their clothes off, keep their clothes on. The disease sometimes gets to a point where in order to get the patient to do a thing, we tell him the opposite; sometimes that is actually effective. This resistance may go so far that it becomes intense and muscular. Patients become rigid, like a log, and resist attempts to move them or bend their muscles. That particular form is called the "catatonic" form. The tendency

to do the opposite of what we ask is sometimes called "negativism." So that we often hear cases described as *stereotyped, negative, catatonic.*

The disease is a very mysterious one, and the most mysterious thing about it is that it occasionally gets well. The vast majority go on from bad to worse and have to remain under asylum care all their lives. On the other hand, just often enough to make us unable to dogmatize, a case entirely recovers after years of mindless vegetation. Where the mind has been all this time, or what has been happening, we have no means of conceiving. We should suppose that the brain must be permanently diseased and the possibility of mental action gone.

For the *syphilitic dementia*, the next type, we have, as I have said, many terms: it is known as *paresis*, as *dementia paralytica*, or general paralysis of the insane, or as "softening of the brain" — which is exactly the opposite of the truth, for the brain really hardens. This is the type of insanity in which we have the best known pathology. The brain in many insanities shows nothing whatever after death, but in syphilitic dementia there are characteristic degenerations in the brain.

Syphilitic dementia is enormously common as an end-result of syphilis, and makes somewhere about forty per cent of the total population of any system of insane asylums. It is, in its later stages, absolutely incurable. In early stages it is helped to some extent by the modern salvarsan therapy which has helped most

of the other forms and results of syphilis. It is the most important, probably, of all insanities for social workers to know, because it is so common and in early stages so easily escapes detection, although in late stages it is usually easy of diagnosis. The early stages show themselves, in most cases, first, by a change in behavior or temperament: a person who has always been polite and punctual begins to be bad-mannered and dilatory; a person always precise and neat in his dress begins to make bad mistakes in that direction; a person always considerate in family relations begins to be fearfully inconsiderate. These comparatively slight changes in temperament are among the earliest that we see. At this time the patient is very apt to be mistaken for one of the psychoneurotics. He is often nervous, shaky or fidgety, and comes to the doctor saying, "I am nervous; I want something for my nerves."

Besides the nervous restlessness and the temperamental changes one of the earliest symptoms may be failure or lapse in the arithmetical faculty. A person who can ordinarily add simple sums loses his previous power. I remember a paretic physician who was still able to carry on his practice in other respects, but could not write his prescriptions or add his accounts. In people who never had any such tendency before there comes a tendency to trembling in the hands and lips. All these things are important when seen against a background of known health; they would not be important if they were habitual or life-long habits. It is

when they suddenly appear in a person of forty or so that they have a special significance.

Sooner or later there come attacks of unconsciousness, falling, or losing consciousness in the street or at table, with or without convulsions. Then come more classic and easily recognized stages, characterized by what are called "delusions of grandeur," not so very different from what we see in the excited stage of a psychosis. Patients discover suddenly that they are enormously rich and very handsome and clever.

All this so far sounds quite harmless, but it is especially important to know that out of such a comparatively harmless state of things the most violent homicidal impulses suddenly emerge. There is no type of insanity so dangerous as this, just because it seems most of the time so harmless. Hence none of the types previously described is such a menace to the general public.

The diagnosis is made much easier of late years by the various biological tests for syphilis. It was not realized until the last few years that this disease is always caused by syphilis, and hence that tests, not only of the blood, but of the fluid that circulates through the spinal column, are valuable in diagnosis. We do not have to rest our diagnosis wholly upon the mental tests; we are able to get some physical evidence as well, in the Wassermann and spinal fluid tests, as well as in the pupils, the reflexes, etc.

In about four per cent of cases, there come periods

of spontaneous arrest when for the time being it does not get any worse. But unless treated early it goes on to the mindless and paralyzed condition whereby it gets its name. This may last for years, usually in an asylum.

The *senile*, or *arteriosclerotic dementia*, is an exaggeration of the peculiarities of old age. We all know the comparatively "normal" peculiarities of old age — the lack of initiative, the unwillingness to undertake anything new, the coldness toward enthusiasm, the tendency to retire into a corner and stay there, the unreadiness to be drawn out from the fireside into any activity, the lapses of memory, the garrulous repetitions, the increased timidity, the slight tendency to suspicion and to hurt feelings. All of this we recognize as within the lines of the normal; it becomes accentuated in the senile dementias. The individual becomes unable to accomplish anything, to concentrate attention on anything, becomes very distrustful of himself, becomes silly, tells his stories not only once or twice, but innumerable times, forgets that he has said a thing a few minutes before. As a rule the trouble is perfectly harmless; in fact I cannot remember an exception. Hence the patient almost never needs to be committed to an asylum. Almost always, if there are any relations, he can remain at home. The disease is a very gradual process, not entailing very much unhappiness as insanities go. Because it often goes along with arteriosclerosis, as I have indicated, it may show

the headaches, dizziness, and failing heart which arteriosclerosis entails. There is no treatment.

Paranoia is a very unsatisfactory term. I do not think any of the alienists are satisfied with it. It is not a clear-cut conception like the others I have been speaking of. But at present there is no better term for a series of cases in which a person is wholly irrational on one set of subjects, and perfectly sane on anything else. We may talk with the paranoiac for hours on all sorts of subjects, and then, if we have luck, of a sudden the conversation will take a turn and he will begin to tell you that the President of the United States and the Emperor of Russia have been conspiring, and have succeeded in having all linen collars made at such a height that it is impossible for him to put his head back comfortably. Why it is they do this particular thing it is impossible for him to say. He is perfectly cheerful. He is not either depressed or excited or demented, but he is entirely "off" on some one subject or group of subjects, and as a rule his irrationality takes the form of a *delusion of persecution*. When a person has only one delusion isolated from all the rest of his (relatively normal) life, that is generally a delusion that the world is in a conspiracy against him. Everybody has a grudge against him and is trying to make his life unhappy.

The person's clearness and sincerity are very apt to mislead us. Surely, we say, this person has been wronged, falsely thrown into confinement. Until we

have been through one or two of those cases we can hardly believe that we are not in the way of rescuing some unfortunate person from the clutches of the unjust. But in trying to look up some of their statements to find if they are true, we find out the actual state of things. Often they become dangerous. Some years ago a Harvard professor's cook, a quiet, harmless body, suddenly decided that if the Dean and the other professors of Harvard University did not stop interfering with her affairs she would have to burn down the professor's house, and she rather thought that she would have to do it that night.

I remember another lady who discovered that all the boarding-house keepers were leagued in a conspiracy against her, and I had to go to some of these before I got a straight story. I found that the old lady was so exceedingly disagreeable that she could not be kept in any boarding-house, and they had passed the word along. *Beware of anybody who comes to you with a story of conspiracy*, of the working together of various people to shoot down destruction on one innocent head.

"Paranoia" is a word that has been invoked a good deal by unprincipled lawyers and others to get sane people, who have committed murder, off from their just deserts. One tries to prove that the person temporarily is beside himself and commits murder under stress of insanity. And because we know so little about the disease, because its symptoms are so vague, its name can be employed in this way for purposes of fraud.

Another name of this disease is *systematic delusional insanity*, because the person has a regular system of delusions, not varying from day to day, not covering all topics, but centring round some one, contrasting sharply with depressed and excited states, and with demented states. The disease is comparatively rare, and as a public charge therefore comparatively small. It is chronic and generally incurable, but sometimes shows partial or complete remissions. I have a patient now who seems to have been very much helped by Christian Science, and as long as she lives with a Christian Scientist she seems to get on pretty well. Many of these patients need not be put in asylums, but can stay at home.

Alcoholic insanity makes up a large group of the cases in any system of public hospitals. It is not nearly as well defined as to mental symptoms as the other types of insanity, but there are two marks by which we can distinguish a good many cases: (1) An extraordinary failure of memory. Memory fails more or less in all insanities, but extraordinarily, out of proportion to any other mental change, and as an isolated phenomenon in some of the alcoholic insanities. I have seen a man whose memory was so completely gone that, while he could hold an ordinary conversation with me, if I went out of the room and stayed out three minutes and returned, he would have absolutely forgotten that he had seen me before. (2) The other characteristic is the tendency to hallucinations, that

is, to mistaken sense perceptions. That shows itself in all types of alcoholic insanity, even in the familiar *delirium tremens*, in which men are apt to "see snakes," also cats, beetles, and all sorts of things, that are not there. A curious fact is that whatever they see is usually black. They have other delusions of sense, delusions of hearing, and they may have systematic delusions like those of a paranoiac, but they always have other mental changes, not the isolated system of delusions that the paranoiac has. Some get wholly well, some partially well, some lapse into demented states and live out their lives in asylums.

If we can abolish alcohol and syphilis, we can abolish more than half of insanity. Inheritance accounts for almost all the rest. Hence it is conceivable, ideally possible almost to abolish insanity. Personally I do not think we shall ever have much power over it therapeutically.

Questions and Answers

Q. Can a case of paranoia have complete recovery?

A. Yes; so far as I know, yes.

Q. Do drugs sometimes cause insanity?

A. Yes; alcohol is a drug that causes insanity, and cocaine or chloral sometimes cause insanity or mental deterioration.

Q. Does the insanity that comes from overstudy come under dementia?

A. There is no such insanity. Insanity is never due to any of the causes mentioned in novels — never due to love, overwork, or any mental cause whatsoever. We hear about those things constantly, but never find it true if we follow

the story up. The person is insane; he then overworks; we discover the overwork, but we do not discover the insanity. He was really insane before he overworked, or before he was disappointed in love. Men are said to come out of the trenches in France insane, but the doctors say that they are not really insane, but fearfully strained, or hysterical; they may even have a temporary psychosis, but they are not insane, they get well. Certainly, then, take it to heart, that mental causes and overwork do not cause insanity.

Q. Would it be considered a favorable symptom in dementia paralytica if the patient had lucid intervals?

A. Yes, favorable, but not proving that he was going to get well. These lucid intervals are common. Sometimes a person with a powerful personality can shake the patient out of his dementia for a time, but he relapses again a little later.

The *mental deficiencies* belong in a wholly different group. They are distinguished from insanity, in the first place, because they have a perfectly definite physical basis, in lack of development of the brain; in the second place, as being a lack rather than a perversion, *a congenital and incurable weakness*. It is a weakness of mind, but not a disease of mind, and always a congenital, not an acquired thing.

We distinguish three grades: the lowest is the *idiot*, a person unable to care for his own person, unable to control his water, unable to feed himself, below the animals. Next comes the *feeble-minded*, who can care for his own wants, but is quite unable to get along outside an asylum or without very close protection. Lastly, the *moron* group (*moron* being the Greek word for *fool*); the village fool of old times, who is often,

except by an expert, indistinguishable from normal persons, has an excellent appearance, can talk intelligently on many subjects, but is forever unable to go without a hand on the shoulder, without some guidance.

The first two types are comparatively harmless sexually, and the last type is the most dangerous of all. All are uncontrolled sexually, but the last type is specially dangerous in the community.

The history of these cases is often more important than the direct mental examination. When did the child walk? When did the child talk? When first have its teeth? These are the three questions on which every expert dwells with special care. Children who do not walk until two or three and do not talk until three or four are under great suspicion, even if we are without any further knowledge about them. I shall not attempt, of course, to go into any of the mental tests or the finer points. There are several systems, the simplest and most generally used being the Binet, which on the whole is extraordinarily useful in children of the school age, but is not applicable to older people unless their mentality is that of school-children. Dr. Healy [1] has tests for the adolescent years beyond school age, and there are others, no doubt good in the hands of the people that invented them.

It is essential to distinguish feeble-mindedness or mental deficiency from the mental retardation due to

[1] William Healy, *The Individual Delinquent.* Boston, 1915.

deafness or blindness, which, if they come on early in the child's life, may prevent the development of the child's mind almost as much as feeble-mindedness does, but which yet may yield somewhat to proper treatment. I suppose Helen Keller would have been an idiot or a feeble-minded girl if she had not had extraordinary advantages in education. When she was first in the blind asylum there was a deaf and blind boy about the same age, Tommy Stringer, whom many then followed with equal interest. It looked as if both were to be drawn out of the prison house, but Tommy never had so remarkable a teacher and he never has developed into a normal boy mentally. He still is distinctly deficient. It is important that an expert examination should distinguish these cases for which there is hope, in which the brain is not deficient but only the senses, from the true mental defects in which there is no hope.

The parents of feeble-minded children are wonderfully slow to see or to admit the defect. Some accidental peculiarity, some lack of education, some failure of general health is usually all that the parent sees. Sometimes there is a story that some one "dropped the baby," or some other accident is supposed (quite falsely) to account for the trouble.

This blindness in parents often makes it difficult to secure from them the permission to commit the child to an institution where in most cases he should remain for life, because he hinders other children intellectually and corrupts them morally in school or out of it.

Judges as well as parents have still much to learn about the dangers of leaving the feeble-minded at large in the community, and about the relation of feeble-mindedness to crime.

Since the trouble is usually hereditary, and since the feeble-minded beget feeble-minded children, state provision of institutional care is essential in order to prevent grave racial degeneration.

Out of feeble-mindedness comes by heredity a vast amount of alcoholism, prostitution, insanity, pauperism, and crime. Whatever is done to prevent by custodial care the procreation of the feeble-minded strikes at the root, not only of this evil, but of all the worse evils against which social workers are striving both in cities and in country districts. No other social problem is so important, because none is at once so widely menacing and so curable.

Q. When do teeth come in feeble-minded children?
A. They come too late. Many do not get any teeth until the second year.

Diseases of the Brain, Spinal Cord, and Nerves

The commonest disease of the brain is known as *apoplexy*. Apoplexy is the familiar "shock" of old people, and is due to defect in the brain arteries — not always to the same defect; sometimes due to the plugging of a vessel, sometimes to the narrowing of a vessel, sometimes to the breaking of a vessel — but in all cases to something wrong with an artery of the brain. If it

comes in people below forty-five, syphilis should always be suspected. Ordinarily we see it in people of fifty-five to seventy; it produces a sudden coma or unconsciousness, more or less complete, perhaps only a sleepy state, accompanied almost always by either paralysis or aphasia, or both. There is usually no paralysis of the tongue; it is only that the connection between the brain and the speaking function is lost.

One of the very interesting types of apoplexy is where we have what we call "word deafness": the person hears what you say, he is not deaf, but words convey no meaning; the sounds fall on the ear, but have no sense. The patient may be able to talk, but his own words also convey no meaning. He does not know what he is saying. This is *sensory aphasia* as distinguished from *motor aphasia*. Sometimes the patient can read but not speak, understands the written character but not the spoken character. Most of these cases get well.

Q. Are the words that they read or speak connected or are they disjointed?

A. Sometimes there are perfectly connected sensible sentences, sometimes these patients can speak a few words, but no more — quite often two words. Then they use these two words for everything, and are not aware that they have not made sentences.

The common paralysis is *hemiplegia*, or half the body, the arm and leg on the same side. The attack may be immediately fatal, but the first attack is usu-

ally not. If it is not fatal the person is left with more or less paralysis, more or less difficulty of speech, and more or less mental impairment. I have never seen a person in whom there was not some, although sometimes slight, mental impairment. This is the type which we distinguish from the hemiplegias which come under heart disease, from the breaking off of a bit of clot formed in the heart. That type (the cardiac type) gets well. The cerebral type gets better, but never, I think, gets wholly well.

One sees a great many of these poor old hemiplegics about the nerve clinics. They are incapacitated as a rule, but not always. We often see stamping about our wards a man who sells papers. He is far from complete, either mentally or physically, but he still can sell papers. He is the only one I have seen earning his living. The most important fact about the treatment of this disease is that there is nothing to do. Any one who happens to be present can feel perfectly safe, because there is nothing he or any other human being can do. Nothing that we fail to do, therefore, can make any difference.

The next commonest disease of the brain is one we have already covered, syphilitic disease of the brain or *syphilitic dementia.*

Brain tumor is not common or of great importance to social workers. I shall, therefore, say only a few words about it. It is an incurable disease in practically every case; very rarely a surgeon can get the tumor

out, for as a rule it fades off into the brain substance so that one could not be sure he had got out the brain tumor without taking out the brain. When we think of tumors we think of elderly people, but brain tumor may come at any age. It produces headaches—headaches for which people commit suicide. Unless the headache is dulled by a dulling of consciousness it may be as great a torture as we ever have to witness. Sometimes it is so severe that morphine has no effect on it. With pain comes vertigo and vomiting without any known cause. Changes in the eyes are almost invariable, and are very important for diagnosis. The eye specialist sees, even in early tumor, changes there which may be very important in diagnosis. What we always hope about these cases is that we are wrong in our diagnosis, and that the case is really syphilis. A localized brain syphilis gives the same symptoms and may be entirely curable. Every case should be treated as if it were syphilis, and I have seen some most extraordinary recoveries in which the patient had every sign of tumor, but was cured by anti-syphilitic treatment. Those mistakes do not happen so often as formerly, now that we have so many tests for syphilis.

Meningitis, a disease of the covering of the brain, not of the brain itself, has three important forms: (1) tuberculous; (2) that coming from disease of the middle ear; and (3) the epidemic, infectious form:—*tuberculous, aural, epidemic.*

Tuberculous meningitis is a disease of babies and young children, although it does occasionally happen in older people. It is *the* common cause of death from tuberculosis in young children. Young children do not die of pulmonary tuberculosis, but of miliary or of meningeal tuberculosis. In the child it produces a slowly progressive dulling of consciousness; the child gets more and more sleepy; at first the mother thinks nothing of it; he then begins to vomit without any good reason, and then begins to have a squint, and then fever — sleepiness, vomiting, squint, fever, generally in that order. The diagnosis is made usually by a lumbar puncture; that is, by putting a hollow needle between the vertebræ in the lower back and drawing fluid from the spinal cord. The spinal fluid, which communicates with the brain, shows tubercle bacilli as well as several other characteristic signs. The lungs do not generally show anything. The disease lasts for several weeks, sometimes months, the child gradually emaciating, and in about 99.9 per cent of cases is fatal. It is not absolutely or invariably fatal. We used to say that if a case got well it proved that the diagnosis was wrong, but recently the bacilli have been demonstrated in the spinal fluid of cases which got well. It can come through the bovine type of bacillus, cow tuberculosis, in perhaps one case in twenty-five; much more often by the ordinary method of taking in the bacilli from other human beings.

Questions and Answers

Q. Can it come from a pulmonary tuberculosis?

A. Yes; it is the final stage of pulmonary tuberculosis in a small percentage, especially of the rarer adult cases.

Q. How long does it take to develop?

A. At first a child may seem just a little more sleepy than usual. Within a week or so we are sure that something is wrong; but the child may simply seem listless and sleepy. There are a great many wrong diagnoses because people do not think the child can have any such terrible disease — he does not seem sick enough.

The second form of meningitis, more cheerful because curable, is that which comes from the middle ear. The chief reason for being greatly interested in every child who has a running ear, in all cases of *otitis media*, is the possibility of meningitis or brain abscess, and the possibility of preventing that. The reason why we operate on so many "mastoid cases" — i.e., to clean out the mastoid bone behind the ear — is that only the thickness of a piece of cloth separates that portion of the skull from the brain. We are always afraid that the infection will go through and produce meningitis. As long as otitis media has perfectly free drainage, so long as there is no involvement of the mastoid, we do not feel alarm. Even after meningitis has begun cases may be saved by prompt operation, getting the pus out. This disease often causes death in babies, and is often wholly unsuspected. The child may not put its hand to its ear at all. There may be no discharge.

The child may have stomach symptoms only — not a thing to draw our attention to the ears. Any child that is sick and not doing well should have an expert examination of the ears. It does not make any difference what a child has; if he is sick and not doing well, look after his ears.

Last week I attended an autopsy on a baby. During life our attention had been centred on the chest and abdomen, yet the autopsy showed nothing wrong there; it was a case of meningitis from ear disease. It is always a social worker's duty to see whether a sick baby's ears have been examined and if not whether they cannot be.

Questions and Answers

Q. Is ordinary abscess of the Eustachian tube tuberculous?

A. Any inflammation in the throat can spread from the Eustachian tube to the middle ear and be dangerous in that way. The ordinary causes of colds, the streptococcus, usually causes the inflammation.

Q. What can you do to keep a baby from getting it? Extreme cleanliness?

A. Generally that means shutting the door after the horse has been gone some time. I do not know any way. What we notice is that the children in poor families, poorly nourished, poorly cared for, have a great deal more of this disease than the children of well-cared-for families. The best thing is to try to have the children well cared for and well nourished. I do not believe local care has much effect.

The third form of meningitis is the epidemic, so-called *cerebro-spinal meningitis*. Really all meningitis

is cerebro-spinal — that word does not mean much; the connection between brain and spinal cord is such that if we have disease in the brain we almost always have it in the spine. This disease is due to a distinct organism, as definite as the tubercle bacillus, and one which we have of late years a reasonable amount of power to cure. I think it is interesting to remember how this came about. Some years ago Mr. Rockefeller thought he would like to do a good work and he hired a man to invent a cure — a man to find a cure for a disease. People laughed at the idea and said: "That means finding a genius; you cannot hire a man to invent a cure for disease." But Mr. Rockefeller kept right on, and after looking around decided that Dr. Flexner was the most promising man in the United States, and paid him a good salary to do nothing in the world but try to discover something new. At this there was loud laughter, but it was not two years before he had worked out an anti-meningitis serum which has changed the mortality of this disease from seventy-five to twenty-five per cent. Now only one quarter die, and if we get them early enough, less than one quarter die. It is now a disease about as bad as pneumonia; not much worse, provided we give the treatment. Dr. Flexner cultivated the bacillus, worked out an anti-serum, like the anti-diphtheritic serum, and supplied it free to whosoever would furnish proof that the patient had the disease. The procedure is first to tap the spinal cord, catch the organism in the fluid,

recognize it, and then inject into the spinal fluid the anti-meningitis serum. This treatment is one of the most satisfactory examples of putting the cure right on the spot. Patients always want something put on the spot — on the head for headache, on the foot for foot-ache — and we cannot do it. But here is a case where we can put the medicine into the brain and spinal cord, introduce it directly, and have it run about through the whole system. The serum is of no use if put into the stomach or into the veins or under the skin; it is of use only if put where the trouble is. The same is true of the anti-tetanic serum, which is useless in tetanus unless it is put right into the brain or spinal cord.

This disease is a rare one. We have not had a bad epidemic now since 1897. Since then there have been very few cases in Boston. This is one of the diseases which is called "spotted fever." There is no such thing as "spotted fever," but meningitis is one of the diseases which has received that name. Typhus is another.

Q. How is the infection carried?

A. I do not think it is known, but the belief is that it is carried by the breath and up the nasal cavities, which communicate with the brain, through the ethmoid bone. The bacillus is found in the nasal cavity sometimes; presumably that is how it gets in, but we do not know it.

CHAPTER XI

DISEASES OF THE NERVOUS SYSTEM (CONTINUED)

Diseases of the Spinal Cord

THE spinal cord is the prolongation of the brain down through the backbone, really a piece of the brain stretched out or pulled out in that direction. It can perform a great many of the functions for which we ordinarily suppose a brain is necessary. An animal deprived of its brain can eat and run about and do a good many things provided it has its spinal cord; it can also get angry or at least show the ordinary signs of wrath.

The most important of the diseases of the spinal cord is *tabes*, syphilis of the spinal cord. Tabes is short for *tabes dorsalis*, or back sickness, a very vague term, the other phrase used being *locomotor ataxia*. That is not good either, because it means that you cannot walk, whereas some of these people can walk perfectly. *Spinal syphilis* is the only proper term for it. It is, of course, very common and as preventable as syphilis, but not as curable as many other forms of syphilis. Until within a few years we have said that it was entirely incurable, but most of us now believe that it can be helped a good deal by the intra-spinal administration of salvarsan in blood serum.

Tabes belongs in two groups, the "high" and the "low." The high affects the eyes, and the eyes only as a rule; the person becomes blind from atrophy of the nerve which leads to the eye and of the corresponding portion of the spinal cord. It is an incurable, a long-lasting blindness following syphilis. The other, commoner form, low tabes, presents itself most often with pains in the legs. These pains, if we have a chance to cross-question a patient, turn out to be different in most cases from any other pains that we see. This particular pain in the legs I cannot say that I have ever seen except in this disease. The textbooks speak of them as "lightning pains"; also as "lancinating" or darting pains, pain that goes through one like "a streak of lightning," shoots up or down the leg and within a second or a fraction of a second is gone. It may be in the arm or trunk, but not nearly so often. It is so brief that one would think it would not be very troublesome, but if those things occur every few seconds it is enough to burden the mind a good deal. "Lightning pains" are often the first thing complained of. Another symptom is a queer type of stomach trouble, known technically as *gastric crises*. This is a recurrent paroxysm of vomiting and pain lasting twenty-four hours or a day or two, and then leaving the individual entirely for days or weeks. It is mistaken for all sorts of things. Cases of tabes are often operated on for peritonitis, gall-bladder disease, or stomach ulcer, because the pains are in the stomach. This

mistake is nowadays inexcusable because we can always recognize tabes if we test for it; but it is a mistake that has happened in most hospitals a great many times. Next to these two symptoms comes weakness in the legs and then troubles with the bladder, difficulty in controlling the flow of urine. The earliest and most frequent sign by which the physician recognizes this disease is the *loss of knee-jerks*.

I do not see why any layman should not learn to take knee-jerks. There is no mystery about it, and it might turn out very convenient. The simplest way, and the way in which we ordinarily proceed, is to have the knees crossed and then to tap below the patella. But although the usual way, that is not the best. People often hold the leg so very stiff that we cannot get the jerk. The better position is with the feet side by side, when a little tap will make the thigh muscle twitch under the left hand laid on it. The whole knack is to know where to strike, and that is quite simple. We feel for the lower edge of the knee-pan where it comes to a point just in front of the knee and just before it merges into a tendon. Then hit the tendon.

In tabes the knee-jerks are absent in the vast majority of cases. There is only one other disease which makes them absent in any considerable number of cases, and that is alcoholic neuritis. There is about one chance in ten that it is alcoholic neuritis.

The other characteristic change is in the pupil, which ordinarily contracts when light is directed at it

from a small pocket-lamp. The tabetic pupil does not budge, stays exactly the same size. That test, again, I cannot imagine why any intelligent person should not learn to make.

I think that we ought all to be able to take temperatures and feel pulses. The doctor whom we want is often not available, and it is often important to know how to steer the patient. I think anything that does no harm and is easy to learn, and gives important information, ought to be acquired by the ordinary citizen. In old times it was thought a very serious matter to take temperatures. My uncle used to recall the time when in the Massachusetts General Hospital no nurse was allowed to take a temperature; it was too serious and delicate a matter. The doctor had to do that.

After the symptoms mentioned, lightning pains, gastric crises, weakness of the legs, and bladder symptoms, comes the train of symptoms whereby the term *locomotor ataxia* takes its rise. When a tabetic loses control of his muscles he does not lose strength; he thinks his muscles are weak, but they are not. The truth is that he does not know how to control his legs; he does not know where his feet are. *We* control ourselves by the sense of the ground under our feet; *he* does not know when his feet touch the ground and when they go off. He sprawls and stumbles because he has lost the sense of distance and position, though not the sense of pain. He can feel a pin-prick.

Still later, in the stages which we do not ordinarily

see because he is not able to go about, he becomes paralyzed — that is, always supposing that the medical treatment that I have spoken of is not available or is not carried out. In early stages we should try to have this carried out, but it takes months and it costs a good deal for somebody. The spine has to be punctured again and again; the treatment has to be given into the spinal cord, not once or twice but many times; and no improvement can be expected until several months have passed. Yet with a fearful, progressive disease like this it is our duty to urge it, I think. Lumbar puncture is ordinarily painful, but not excessively so. Some patients have pain afterwards in the puncture or in the head or in the legs, especially patients to whom it is done in an out-patient department and who do not lie in bed. They have pain and usually severe headache. But in a disease for which we have no other treatment to offer, we should urge a person to bear the pain. The puncture is made on the level of the hip bone; we carry the line around from hip to hip, and where it crosses the backbone, there the puncture is made. We reach the spinal canal, which communicates with the brain, and put in the medicine there.

Questions and Answers

Q. Can the locomotor ataxia patient be taught to walk?

A. Yes; a certain number of them, even without intraspinous treatment, can get over that one symptom. A man who does not know where his legs are can learn (provided he has an unusual amount of stick-to-it-iveness), without

any treatment at all except walking up and down a chalk-line until he can do it accurately.

Q. Does a conquest of the difficulty in walking interfere at all with the progress of the disease?

A. No; the disease goes on just the same. For practical purposes supervision helps toward this reëducation of the leg muscles. It is not complicated; there is no difficulty about it, if a person has perseverance enough; but most people won't do it by themselves.

A. Does locomotor ataxia result from anything else than syphilis?

A. Not in my opinion, nor in the opinion of most physicians at the present time. Locomotor ataxia is never inherited nor due to anything but syphilis.

Q. When a person has syphilis in the form of locomotor ataxia, may it be inherited by his children?

A. No. He may have given syphilis to his wife and children in some previous stage of the disease, but at the stage of tabes it is a danger to no one except the patient himself. A patient may develop it in youth; syphilis may develop so fast that the tabes appear even in youth.

Q. Should the family of a case of this sort always be examined?

A. Yes, I think so.

The outlook and treatment of tabes until within the past two years has been pretty hopeless, and it is because we do not now so consider it, and because the course of treatment that we advise takes so long and costs so much, that I feel that we all ought to be conversant of what is ordinarily done.

Until we realized that we could go straight to the place where the trouble is in the spinal cord, we had very little if any control of the disease. The intraspinal

injection of salvarsan in its pure state is very dangerous, but if the patient is first given salvarsan into a vein in the ordinary way, is then bled, and his own blood serum put back into his spinal cord, that does good. It does not do good in a single treatment, nor often within a single month. The cases that have the best results have been treated for from half a year to a year. The disease may cling to a patient for thirty or forty years and go slowly but steadily on from bad to worse, so the fact that the treatment is long and tedious is not a sufficient reason for not doing it.

The treatment, already described, intraspinous injection of salvarsanized serum, is carried out in all the larger cities now; the patient is given injections, at intervals of from two or three weeks to a month or two, over a long period. Sometimes mercury is used in the same way; one cannot put salvarsan directly into the spinal cord without great danger, and there have been deaths from this attempt. But when the drug is put into the blood and the blood combined with it, and that blood put into the spinal cord, one can do it without harm. When we urge this treatment upon patients, we must make it clear that they cannot expect any results within a few weeks, that they have got to go to the doctor a great many times, that their home doctor usually cannot do it — very few doctors are willing to take the trouble and run the risks. All this has to be explained to the patient, but if it is explained and still he wants it done, we can and we should exert the

amount of pressure that laymen or social workers can exert, because they are looked upon as being unprejudiced. The doctor may be suspected, often falsely, of favoring the treatment because he is fond of doing it or because he profits by it.

After this treatment I have seen men lose their pain, get back their control of the bladder, become able to walk. The objective evidence of the disease, as we find it in the spinal cord itself through spinal puncture (the diseased condition of the spinal fluid), decreases parallel to the improvement of the patient. We are comforted by that because in a disease which lasts so long the effect of suggestion on symptoms is so great. But suggestion won't change the number of cells in the spinal cord or make the positive Wassermann become negative. Because of this objective improvement we have more confidence than we otherwise should have that the treatment is of some use.

Most of the other diseases of the spinal cord aside from tabes have the same cause, — that is, they are mostly syphilitic, — and I do not think much needs to be said of them. They may improve under anti-syphilitic treatment; they are apt to improve more than tabes does. There are acute forms of syphilis of the spinal cord which produce a sudden and complete paralysis, and yield very thoroughly to anti-syphilitic treatment.

One form, which we do not know to be syphilitic, is generally spoken of as *spastic spinal paralysis*. Most

of us have seen examples of that on the street. The gait is characteristic; the man cannot lift his feet. He scuffs and drags his feet along, owing to the spasm of his muscle. There is no weakness, the muscles are strong, but they are in a constant state of tension. This is, so far as I know, incurable, because the only hold we have on the other forms, the anti-syphilitic treatment, we have not in this. The only thing to do is to arrange braces, which sometimes make it a little easier for the individual to get along, by giving him some relief in walking.

Then there remains *poliomyelitis*, which is chiefly a disease of the spinal cord, although we do not often think of it in that way. This is infantile paralysis, the paralysis of which we have heard so much in late years, which seems to be epidemic, the cause of which we know something about, but the method of transmission of which we still do not know. *Spinal paralysis of children*, *infantile paralysis*, and *poliomyelitis*[1] are all the same.

It was not until within a few years that we had any idea that this was a germ disease; its tendency to run in epidemics somehow had not been noticed. It is, however, an infectious disease, though not contagious in the ordinary way. The curious thing is that as we go through a village we find one case in a house, rarely

[1] *Polio myel itis: itis* means inflammation; *myel* means spinal cord; *polio* means white — the inflammation of the white portion of the spinal cord.

two cases in a house.[1] This is something which nobody has so far been able to understand. Sometimes it has been noticed that it seemed to go down one side of a street, but on the whole this seems to be not more than a coincidence. The cases come in groups. The New York epidemic of 1916 is the largest on record, but in Boston we had over one thousand cases a few years ago and there have been extensive epidemics in Scandinavia and other places. Adults are very rarely affected; if an adult gets it we are always doubtful of the diagnosis. In children it begins usually with symptoms of a fever and often with brain symptoms like those of meningitis;[2] the child feels hot; we find a temperature; he is headachy, listless, cries, and vomits; but often nothing is thought of the matter until, usually the next day, the paralysis is noted. The paralysis is most apt to affect one leg or some of the muscles of one leg. Luckily that is the commonest thing; it may affect both legs, both legs and both arms, or it may affect every muscle in the body and be fatal — fatal by affecting the muscles of the breathing apparatus, getting hold of the diaphragm and making it impossible for the person to breathe. Many recover without paralysis; others with a paralysis left which practically never gets well; it gets better, the amount of improvement differing in different cases, but it almost

[1] Out of the first 7000 cases in the New York epidemic of 1916, 6748 were in different families.

[2] See page 260.

never gets well. I have known it to get so nearly well that the boy who had it grew up to be an athlete and rowed stroke on a Harvard crew.

The results of poliomyelitis have come to be the province of the orthopedist because the apparatus and the operation upon the tendons (which often have to be transplanted) are more properly in the orthopedist's province. Apparatus is used for supporting the paralyzed leg, especially in the early stages. We generally advise massage and local treatment of that sort, to keep up the nutrition of the muscles, but not a great deal is accomplished in that way.

It is a long, partially crippling injury, with a need for vocational steering in relation to the patient's subsequent work, a need for relief often when it happens to an adult who has been working, and for help with the expensive apparatus. It is the commonest disease of the spinal cord that we see, except, perhaps, tabes.

Questions and Answers

Q. Is it known to follow any other children's disease?

A. No, I think not.

Q. Does the limb shrink?

A. Yes; the limb atrophies always — the amount of shrinking depends upon how many muscles are involved.

Q. Does recovery depend on the severity of the attack?

A. Yes. The amount of motion recovered in paralyzed children depends on the extent and severity of the original attack.

Q. Is the brain affected?

A. The brain is usually not affected. As a rule the disease

vents itself chiefly or wholly on the spinal cord, and does not affect any other part. It is not painful except in the earliest stages.

Q. Is there an operation for it?

A. Yes; one of the operations done is to transplant the tendon from a sound muscle into the paralyzed one; in some cases that has had brilliant results.

Q. Are nervous children more apt to have this?

A. No, not so far as any one knows.

It does not affect the speech. There was a time when it was believed that it was transmitted by the fly, and that is not absolutely disproved yet, but it is not the prevailing belief at the present time, which is that this is given the way colds are given, from the throat and nose. This, like all the theories about its mode of transmission seems to me improbable. The only animal who can be made to take it is one species of monkey, and at the Rockefeller Institute in New York a great deal of fruitless experimental work has been done upon them in hope of finding some way to control the disease.

Diseases of the Peripheral Nerves

The one important disease of the peripheral nerves is *neuritis*. Neuritis is a very popular ailment, but as a matter of fact it is a rare disease. One can practise a long time and never see the disease, but one hears of a great many diagnoses, especially upon the lips of his patients. "Neuritis" sounds better than "neuralgia," but it would not sound so well if people knew that it is

generally due to alcohol. *Alcoholic neuritis* is the most usual form. The alcohol circulating in the blood gets hold of the nerve fibres and degenerates them so that we get weakness and paralysis chiefly of the legs, often with pain and numbness, and sometimes with swelling. The most important thing to know about this is that it gets entirely well provided the individual mends his ways. It is unlike diseases of the spinal cord, which very rarely get wholly well. These nerve diseases outside the cord show an extraordinary capacity to heal. You can say with perfect confidence, "Yes, if you will stop drinking you can get entirely well."

When I was speaking of tabes I spoke of the loss of knee-jerks in that disease. Alcoholic neuritis is about the only other disease in which a person loses both knee-jerks.

Occasionally we see a *pressure neuritis*, a neuritis from great pressure on the nerve, sometimes called the "Saturday night paralysis." It is quite a picturesque disease. A gentleman dines a little too well and goes to sleep upon the Common; he puts his arm over the back of the settee and goes to sleep with his head on his arm. As soon as the arm begins to get uncomfortable, the average sober person would wake up and shift his position, but the alcoholic does not know anything until next morning. Then he wakes to find his arm paralyzed, and on Monday mornings we used to have a group of these patients in the out-patient department of the Massachusetts General Hospital. The moral

effect of finding what has happened to them as a result of their habits is often very salutary. This, like the other forms of neuritis, gets wholly well in the majority of cases; in the course of time the man recovers full use of his muscles.

Q. Can neuritis come from injury?

A. Yes; the type just described comes from injury. Another type results from bad wounds or blows or crushes of the arm. Any great strain or tearing upon the arm sometimes brings about neuritis. I remember a man who was riding one horse and leading another; the other horse tried to get away and in trying to hold him the rider tore his brachial plexus of nerves and had neuritis.

Do not believe that people have neuritis merely because they have pains in the arms. These pains are very common, and in the vast majority of cases there is no reason to suppose that there is any neuritis. The great thing about neuritis is that it gets well and that it is rare and that treatment has very little to do with it.

The difference between neuritis and neuralgia is easily made through electrical tests given by any neurologist or any neurological department. These tell us whether the nerve is affected or not. When the nerve is actually affected, recovery is usually much slower than when we are dealing merely with a pain, neuralgia, without organic basis that we know.

There are certain other diseases of the nervous system that must be named, although we do not know

their organic basis. The most important is *epilepsy*, a disease characterized by fits of unknown origin. There are a great many fits whose cause we know; the patient with Bright's disease has fits from self-poisoning — uremia; the patient with syphilis or paresis has fits from the actual disease in his brain. But the epileptic has fits, and after death we often can find nothing wrong in the brain.

There is something more to be said in description of the fits. The epileptic fit differs from the hysterical attack, and the main differences should be known by every one, I think. The epileptic patient generally falls in his fit, and that is in contrast with hysteria and many other seizures in which people generally do not fall, but get to a chair or step. The characteristic thing about an epileptic is that he first stiffens out rigid and then falls so that his head is the first thing that strikes. He is very apt to hurt himself. The hysteric never hurts himself by falling; he has enough warning of what is coming on to guard himself. The epileptic attack generally begins with a cry, a shout, or scream of which the individual is practically never aware; he hears from his friends that he has cried out. That again is in contrast with hysteria. The epileptic falls and remains absolutely unconscious. The hysterical patient can be aroused by proper stimulation, sometimes thermic, sometimes psychical. The epileptic cannot be aroused by anything whatsoever. He is unconscious for a few minutes, never over an hour. For a few min-

utes, as a rule, during the unconsciousness, he has shaking movements of the arms and legs, alternating contraction and extension, so that the arms and legs "work." He also opens and shuts his jaws, and thereby bites his tongue. The first aid consists in putting something between the teeth so that the individual cannot bite his tongue; it saves a sore tongue afterwards. These patients look very ill. It is a very terrible thing to see the first time one sees it, but nobody ever dies in this type of fit. After a few minutes the epileptic relaxes and remains in a heavy, sleepy condition, usually for some hours after it. He may vomit at the end. He is very apt to pass urine during an attack, which a hysterical patient never does.

The French terms, *grand mal* and *petit mal*, have been adopted pretty much all over the world. What I have just described is *grand mal*, the big attack. I must add that one of the most important things about the epileptic is the various queer things which he may do just after an attack. He is often not right in his mind for some time after an attack; that is, for some hours, occasionally a day. This may show itself merely in his being sleepy, stupid, in being rather cross and cranky, or it may show itself in criminal acts of which the individual has no knowledge and for which he is not responsible — a very important medico-legal aspect of this disease. One of Dr. Healy's most interesting chapters [1] is devoted to the criminal or epileptic

[1] William Healy, *The Individual Delinquent.* Boston, 1915.

type whose misdeeds are really an effect of his epilepsy, and for which he is not in any way responsible. If he has his fit away from home, on the street, or in the country, he will get up and wander off somewhere, will have no idea where he is wandering to, and will sometimes get lost.

Petit mal, the other form of epilepsy, may precede but generally accompanies *grand mal*, the slighter attacks coming in between the more severe ones. They are much more frequent, may come a dozen times a day, and may last only a few seconds. They consist in a temporary lapse of consciousness. The person who is talking to one may stop talking, look very vacant, evidently not hear one, drop what he has in his hands, and yet in two or three seconds the whole thing is gone and he goes right on with what he was doing. These attacks are important chiefly for their after-effects. A patient of mine who has had these attacks again and again came to me one day very much troubled: "I had one of my attacks yesterday; I remember that, and the next thing I found myself in Chelsea. How I got there I have not the least idea." The patient may be perfectly unconscious of what he does in the next hour or so after one of these *petit mal* attacks. He may get into criminal troubles and in fact is very likely to, because the *petit mal* is such a slight thing that it does not bring him under anybody's care. One of my patients who had these attacks would always notice that people near him suddenly began to grow very small and to

make faces at him, and then the whole thing would stop and he would just be a little dazed, but might not know what he was doing for some hours after that.

Epilepsy is for practical purposes incurable. I do not mean that we cannot find a cured case; I know two or three cured cases out of hundreds which have not recovered. The milder cases taken early can sometimes be cured. Some of the enthusiasts tell us that it is just like tuberculosis, that we can cure the incipient cases. I do not think that this is quite a fair comparison. It is much rarer to see a cure of epilepsy than of tuberculosis. Epilepsy practically always comes on in youth. If we hear that a person has developed epilepsy past forty, we can be pretty sure that the diagnosis is wrong. They may develop fits due to something else, such as syphilis or arteriosclerosis, but not true epilepsy.

The treatment is a good deal like the treatment of tuberculosis, but one feature of it is different. That is the simplification of environment with the diminution of every kind of strain and interest and stimulus that there is. If we can get a person almost bored to death he may get better. If he never sees anybody, never does anything, he may get better. The hygienic aspect of the treatment is also an essential part; it is not merely this cure by boredom, it is also true that regular, outdoor life, early hours, extra amounts of sleep, make a difference.

The prevailing view about epilepsy is that it is a sort

of explosion of gathered-up energy, a brain-storm or explosion, the result of stimuli of all kinds, physical and psychical, coming into our senses, and that the best cure is to reduce all these stimuli. This we accomplish in part by drugs, and the one drug which is practically always given and which is of use in diminishing the number of convulsions is bromide of soda or potash. From time to time we hear that people are going to get along without bromide, but we do not often find that it is true. Any one bromide does as well as another; there are always new ones which are of interest, but do not make any real difference. It is a drug which makes us stupid if we take enough of it, makes us less keen to feel the interests and stimuli of life. It acts in the same way as the simplification of environment that I have described. Unfortunately it is bad for the patient in other ways; it makes him depressed, torments him with skin eruptions, and often upsets his digestion. Still, in moderation and combined with other kinds of treatment, it is essential.

One of the greatest problems of the epileptic is his work. There are few employers who will take the responsibility of employing a man who has fits. It may be that he does not have one more than once a month, but people do not like it and we can't blame them. It is a terrible thing to see. Moreover, it may occur at a critical point in the management of a machine such as a locomotive. I do not know any satisfactory solution for the problem of the epileptic on the

industrial side. The places where it has been most nearly solved have been colonies like Bielefeld, in Germany, where epileptics, with other people who could not take part in the ordinary activities of life, were set aside and kept busy on simple tasks.

Diet makes a difference — the diminution of meat and the diminution of salt especially. We can cut down the number of fits at once by diminishing salt, but we generally get the epileptic into such a state of mind that he would much rather have the fits than go on. This does not mean merely not taking salt at table, but not having salt cooked into food; if all salt is left out of food in this way it is a very great deprivation. We cannot do it for a long time; patients cannot stand it. Riots result.

Epilepsy complicates all sorts of other problems. For instance, many of the insane and many of the feeble-minded are also epileptic.

Questions and Answers

Q. Will you tell us the difference between the fits caused by arteriosclerosis and by epilepsy?

A. There is n't any difference; but in one case the history and physical examination show arteriosclerosis, whereas the examination of the epileptic is entirely negative.

Q. With arteriosclerosis do you have a diet also and give bromides?

A. We are not so apt to give bromide, but we do limit the diet. The person with arteriosclerosis does not have his fits with any regularity; he may have one fit and then never have another.

Q. Can the course of arteriosclerosis be controlled by diet?

A. To some extent, I think, yes — not obviously or brilliantly.

Q. Might the arteriosclerotic have *petit mal* and no *grand mal?*

A. Yes.

Q. Is epilepsy apt to lead to insanity?

A. Yes; that is, if it lasts long enough, it generally produces a mild grade of dementia, the silly and mindless type of insanity; but that is very slow. I have followed patients for over ten years without seeing much of any change in the mind. The fits tend to increase in intensity as time goes on.

Q. What type of patient should be sent to a state institution such as Monson?

A. The type that cannot be taken care of at home. Monson is not a pleasant place. But it is a great deal better than nothing. I should say the same of insanity. The patients whom we send to an asylum are those who cannot be taken care of at home. It is a tremendous strain on those at home, a strain financial and mental. I know a great many epileptics now being taken care of at home because they are well-to-do. It is chiefly the poor who have to go to an institution.

Q. Is epilepsy inherited?

A. Not as such. There is often something wrong in the inheritance. The alcoholic father has an epileptic child, or the syphilitic or the insane father has an epileptic child.

Migraine is another disease of the nervous system without known pathological basis. We do not know the cause. It is also inherited, and here often directly inherited. The father or mother has sick headaches and the son or daughter has sick headaches. Migraine is periodic sick headache — "sick" in the English

sense of nauseated. The migraine headache differs from other headaches in that it is periodic, apt to come about once in so often without any particular relation to any particular cause, and that it generally runs a stereotyped course of so many hours with such and such manifestations, every time. It is most apt to come at the menstrual period. There are many women who never can go through a menstrual period without a sick headache. The attack is apt to begin in the morning and last till the next morning, but it may begin at any time. It is apt to be on one side of the head, and that is where the term came from — "hemicrane." The pain is apt to shift to the other side before the trouble is over, and has no relation to any structural or anatomical basis, so far as we know. Sooner or later the patient becomes nauseated, is apt to vomit, and with that get well, generally after a long sleep.

About the only good thing we can say about this disease is that in women it is apt to stop with the menopause, or at any rate get much less severe. I have never seen a case cured. There is nothing that a doctor hates more than to try to cure this type of headache. Hygiene can diminish the number of attacks. People who can afford to devote themselves in part to their health can have much less frequent headaches. People away on vacation often do not have them, because vacation means better hygiene. We can crush the pain to some extent by heat, and by drugs, such as acetanilid, phenacetin, and the other coal-tar antipyretics,

or morphia. With some people nothing affects the pain at all. I see no reason for not giving drugs when they do relieve. Some people are relieved by aspirin, more are not. Acetanilid, the most important constituent of most headache powders, is a dangerous drug and never should be given or taken without a physician's directions. There have been a number of deaths from acetanilid, but if taken under a physician's directions it is a marvellous drug for pain. In headaches which do not come more than once a month and in persons of strong character, we sometimes venture to give morphine without any great fear of creating a habit.

Migraine is enormously more common in women than in men, no one knows why.

Questions and Answers

Q. Does migraine begin in small children?

A. I have never known it to do so. I have never known it before the tenth year.

Q. Have you ever known a case treated with ideal hygiene to see if it would disappear?

A. Yes; I have known a good many, but never known a single case to disappear even with ideal hygiene.

Q. Is thyroid extract sometimes given for this?

A. Yes. But I have never seen any brilliant results.

CHAPTER XII

DIABETES — DISEASES OF THE BLOOD — DISEASES OF THE BONES AND JOINTS

Diabetes

So far I think every disease that I have spoken of has hitched itself to some organ. We have described diseases of the heart, of the lungs, liver, and so on. But diabetes is a disease which is of no organ whatever. At the *post-mortem* examination there is often nothing to show for it. It is a chemical affair and not a physical affair, and presents the best common example of a purely chemical disease. We do not know its cause. We have no reason to relate it to one bodily organ rather than another. The essential trouble in diabetes is that the body loses its power to transform the carbohydrates of food into heat and energy; it loses the power to burn sugar. The body normally burns its food and so gets heat out of it, or transforms it into useful tissues. In this disease that power is lost and the carbohydrate portions of our food — that is, the sugars and starches — pass out in the urine as sugar. They pass out because they cannot be used, and that for no reason that we know. *Diabetes* means "wasting," and *mellitus* means sugar, honey. Saccharine urine is merely one way that the disease manifests it-

self, the essential thing being that the body cannot take care of one of the three great portions of its food. The diagnosis is simple; very often patients make it for themselves. The symptoms are thirst, tremendous hunger, and emaciation. It is one of the two diseases in which adults lose flesh despite a good appetite and good digestion. (Toxic goitre is the other.) In all diseases, except thyrotoxicosis and diabetes, in which adults lose flesh, it is because they do not eat or do not retain or do not digest.

Diabetes is one of the frequent causes of death. It figures high in the percentages of mortality reports, and so far as we can tell it is increasing. There are some reasons to doubt that, because American mortality statistics are such unreliable things. But if one accepts the face value of reports, the number of deaths from diabetes is increasing. It is from two to three times as common among the Jewish people as among any other race in this country.

Q. Has it anything to do with what they eat?

A. No; it is not due to any peculiarity of their diet. It has often been said to be associated with the Jewish temperament. The Jewish temperament is a high-strung, keen, intellectual temperament, with great openness to worry, and it is a fact that many healthy people can temporarily bring sugar into the urine by fear and worry. Students at examination time, and people who have been through great grief, often have sugar in the urine temporarily. One guesses, therefore, that a race which tends to emotional strain, worry, and fear would be more easily attacked by this disease. We

cannot say that the disease is due to fear and worry, but merely that it seems to have some connection with those emotions.

Diabetics can be divided into two groups, the thin young ones and the fat old ones, and this, although it sounds like a rather rough-and-ready calculation, has practical importance. For the thin young ones generally die soon, the fat old ones often live for years and then do not die of diabetes at all. In some of the fat old ones it is hardly more than a serious inconvenience; in the thin young ones it is a tremendously fatal disease. The younger the worse; in children any length of life is almost unknown.

The diagnosis is very easily made by a test of the urine, which one can make in two minutes and which any one can be taught in one minute. We teach patients now at the Massachusetts General Hospital to make their own tests of urine as they perfectly well can.

As soon as any marked worry comes to the patient's life, up goes the sugar, when it has been scanty or absent before. The management of this disease is wholly a matter of diet and hygiene, and we come near to being able to manage it successfully. Medicines have absolutely no effect on it, and if one hears of any patient who is taking medicine for diabetes one can be tolerably sure that he is under the care of a quack. Medicines have no more effect on diabetes than on cancer.

The treatment may be divided into two periods —

that used up to two years ago, and that used in the period since. I shall speak most of the present period. In the period up to two years ago, what we did chiefly was to cut out from the patient's food all sugars and starches, all carbohydrates, and replace them by an excessive amount of proteid and fat. That worked very well for mild cases, and for the fat old people. It did not work at all well for the young thin ones, and only tolerably well for the middle-aged and medium-sized. Two years ago a new system of treatment began to be used, Dr. Allen's.[1] The Allen treatment of diabetes is the one that many physicians are using in this country, either because they are convinced of its value or because they are very much in hope to find it valuable. We are treating all our cases at the Massachusetts General Hospital by that method. Dr. Allen is now at the Rockefeller Institute, where he has a most extraordinary clinic. He will see only hopeless cases. Until very recently he had not lost a case; of all the hopeless cases he had treated, not one had died. He is not saying that they are cured or near it, but merely that no one has died, though at the time when they came to him they had apparently only a few weeks or months to live.

The essential thing is starvation at the start. We starve every patient for a short period to get the sugar out of the urine. We never dared to do that until Dr. Allen showed that it could almost always be done

[1] See E. P. Joslin, *The Treatment of Diabetes*. New York, 1916.

safely. We starve him one day, two days, three days on the average, but as many days — up to ten days — as is necessary to take the sugar out of the urine. Starving does not mean the deprivation of water, but the withholding of all food, and it is extraordinary how well the patients bear it. So long as they are in bed they will get along, sometimes with no loss in weight, sometimes actually with a gain in weight. This is almost impossible to believe, but it is because they are holding water in the body. The water they take stays in the body for a time and keeps their weight up, although they take no food. Of course that is only temporary. In a little while the water is passed out and the weight goes down.

After a period of starvation we begin experimentally and build up the diet to see what can be taken without the patient's passing sugar in the urine. There is for each person an individual limit; we give him a certain amount of food and raise it each day; as soon as sugar appears, stop and go down a little. In that way we work out what his permanent diet is; that is, what is the largest amount of food he can take without producing sugar in the urine. When this is found, a person must usually stick to it indefinitely.

The great obstacle to curing people is that they will not stick to their diet. They will break through; would rather die than keep to what they have been told they can and must keep to. Although there are difficulties with the Allen diet, and the patient still

wants a great many foods which he cannot have, it is not so bad as the old diet. We used to force in enormous amounts of butter and cream, but butter, when one can't have bread, is not inviting. One of the important things the social worker can do is to warn all patients against diabetic breads. They are one of the worst of frauds; they always contain starch, they are expensive, and they waste the patient's money. We ask a patient, "Do you eat any bread?" and they always say, "No, no bread." "But," we say, "you eat gluten bread, don't you?" "Oh, yes, I take gluten bread." Now gluten bread is just as bad as any other bread, and it is expensive and wasteful; if patients are going to eat bread they had better eat real bread.

Q. Is there any difference between crackers and bread?
A. No; most people would rather have bread; but there is little or no difference in relation to the urine.

The diet that a diabetic patient must take is a little more expensive than the average diet, but not very much so; that is a great boon. Previous to Allen's discoveries diabetic diet was a great deal more expensive, the amount of cream, etc., brought it up to high figures.

In relation to social work the important points are that a person once diabetic is always diabetic in the vast majority of cases. They are to that extent limited in what they can eat, and must keep up the diet for life. This needs self-control, but it saves life. One of

the most energetic, healthy men that I know has now been on this diet for two and a half years, never worked harder, never looked better, holds his weight, and everything is going splendidly. We can't say more than that as to the future because Allen's treatment has been in use only three years. Perhaps it will break down with time.

Anything that makes people sad, nervous, worried, or fearful is at once bad for the health and shows itself directly in the urine. I have no doubt that the same is true of many other diseases where we cannot prove it by chemistry, but diabetes is a disease where we can easily prove the bad effects on the body of depressing emotions of any kind. Any intercurrent infection, grippe attacks, anything that a diabetes patient "catches," makes him worse.

I believe that before long a great deal of what doctors now do in the treatment of this disease will be handed over to social workers and to nurses, because the doctor can perfectly well tell somebody else how to do most of it. It is so simple. Then the doctor would be free to do what he has trained himself to do, things that require more technical skill than this does. I think before long social workers will know this disease especially and in detail. A doctor of my acquaintance recently told me that one of his secretaries had previously been secretary to a specialist in diabetes: "and now," he said, "she knows more about diabetes than I do, although she has never had any medical training at

all." And he was perfectly willing to leave the treatment of a diabetic to her. The treatment, not the diagnosis of diabetes, can be split off from the rest of medical knowledge and worked out through subordinates in this way. Thus the disease can be treated much more cheaply — an important point in the economics of public health.

Q. If the patient were not eating carbohydrates would worry increase the sugar?

A. Yes; that we have proved; a person whose urine is sugar-free on a perfectly satisfactory diet can get sugar into the urine by worrying.

Q. Where does the sugar come from?

A. Any of the tissues of the body can make sugar; it comes from carbohydrates; it also comes from proteids and fats.

Diseases of the blood

Anemia is the only common disease which we call a disease of the blood; strictly there are no diseases of the blood; there are various diseases that show themselves in the blood and elsewhere, too. Anemia means a lack of red corpuscles. Our blood is a fluid which floats upon its stream two or three kinds of cells, the most numerous of which are what we call the red corpuscles. It is these that give us color when we have color; the color of our cheeks and lips is due to the redness of the red corpuscles. These cells carry oxygen from the lungs to the tissues and carbon dioxide from the tissues to the lungs and make that extraordinary exchange previously described. Blood is the most

complicated substance known in the whole universe; it has literally hundreds of other functions besides this.

When the red cells are deficient in number or in size, they do not contain as much of the essential substance, hemoglobin, the colored matter of the blood — the essential thing from the point of view that we are now considering the blood. The corpuscles may be numerous enough, but each one of them individually poor in hemoglobin.

Anemia is a rare disease. "So-and-So is anemic" is a phrase we have constantly upon our tongues, but generally the diagnosis is made merely upon the fact that a person is *pale*. Many of the palest people are never anemic, and many red-cheeked people are anemic. True anemia, judged by blood examination, is a rare disease. Any social worker who has spent much time in hospitals must have seen the common hemoglobin test which we make so many times each day and which gives us the bulk of the knowledge we need for the diagnosis of anemia. We pierce the skin at the least sensitive point, the ear, suck a drop of blood into a bit of standard blotting-paper, and compare the color of that drop with a series of standard scale red-tones, from one hundred, which we call the normal for adults, down to the lowest that we ever see, which we call ten. It is a very simple color-matching process, much simpler than taking a temperature, and will not long be thought to be the prerogative of people who

have studied medicine for four years. In Germany and other places, where they do not care so much about pain, doctors puncture the finger instead of the ear, but the finger is the worst place to puncture because it is the most sensitive. We can get blood much more easily from the lobe of the ear.

Anemia results in the first place from hemorrhage; whoever is constantly losing blood, or losing it in large quantities, gets anemic before long. The body has extraordinary power to make up loss, and even a quart may be made up within a few weeks. Hemorrhage from the stomach, for instance, from a gastric ulcer, hemorrhage from the bowel, from hemorrhoids (if long continued), from wounds or operations, from the uterus, as from fibroid tumors, are among the commonest causes of this type of anemia. If the cause can be removed, if the hemorrhage can be stopped, this type of anemia will almost always get well. The body will build up its blood again provided the drain is not going on perpetually.

In contrast with this is the anemia which is secondary to cancer. Because we almost never can remove the cause the anemia itself is almost never cured. Cancer of the stomach, of the uterus, of the breast, are accompanied before long by a severe anemia. Chronic kidney trouble, Bright's disease, syphilis, rickets, often produce anemia; also lead poisoning, the last an example of an anemia which we ought to be able to cure because we ought to be able to remove its cause.

All the types spoken of thus far are what we call "secondary anemia." That means that they are due to a cause which we know. In contrast with that there are two types of "primary anemia," — that is, anemia of unknown cause; "primary" never means any more than that we do not know the cause. The commonest of these is called *pernicious anemia*, and is a disease which is thus far, except for a short time, incurable. In *post-mortem* no cause is found in these cases. The person loses color, the number of corpuscles in the blood diminishes all the time, although there is no hemorrhage, the patient gets to be of a sickly pallor, and finally dies without suffering, because he has n't blood enough to keep him going. This is a disease of elderly people, usually past forty-five. All sorts of causes have been assigned, but we have not any idea of its real cause. The two things which do the most good temporarily are the transfusion of blood from another person, and taking out the spleen by operation or by X-ray.

The transfusion of blood from another person has perfectly miraculous effects for a short time. Recently, in the Massachusetts General Hospital, a very advanced case of pernicious anemia had just been admitted when I made my visit. His color was like that of pale yellow paper, not a trace of normal human color anywhere in his face. Next day, to my surprise, he had so bright a color in his cheek that I could hardly believe it was the same man. The house officer said,

"Oh, yes, we transfused him yesterday." That was some weeks ago and to-day he is as rosy a specimen as you would like to see. We know he won't stay thus. These improvements are, so far as we know, never permanent, but for the time being he is vastly better. Ordinarily we should go right ahead and take out his spleen, but in this case there is one first-class reason why we do not — namely, we took it out last year.

We take out the spleen because the spleen is supposed to act as a destroyer of red corpuscles. We have no idea what the spleen is good for, but we have some notion of the harm it does, especially in pernicious anemia. It certainly destroys red corpuscles, even in healthy people. But it has been supposed until recently that it only destroyed those that were pretty nearly dead anyway. After splenectomy these patients have done better than after transfusion or after any medication that we have known. We have some that have been alive for two years and are still well, and it is possible but not at all probable that we may cure some of them.

In transfusion we give ordinarily about half a pint of blood. Of course, that is not enough to make up what is missing. What it does is to stimulate the bone marrow (where the new red corpuscles are made) so that it takes up the job that it had abandoned.

Questions and Answers

Q. Does it make any difference in the selection of the person for the transfusion? Must he be related?

A. He must be related biologically, but need not be of the same family. We first test the blood of the patient with the blood of the donor; any candidate has to be first tested to see that his blood does not break up or interfere with the blood of the patient. Sometimes relations won't do at all, and a mere stranger is all right. In one recent case a patient's son who was ready and willing to give blood was found to be entirely useless, but we have donors on tap at ten dollars each. We can always get them from Harvard. After giving blood the donor may feel a little "seedy" for two or three days; after that he is as good as new. I think this is one of the most picturesque aspects of medicine. We so often hear from friends and relatives of the sick, "Oh, if I could only *do something!*" This is one case where a friend can do a great deal; indeed he may save life though not in pernicious anemia. We transfuse in other diseases also where the attempt means simply the difference between life and death. The technique is to go straight from vein to vein; open a vein in the donor, transfer the blood to a glass receptacle coated with paraffin, open the vein of the patient, and put the new blood in.

When people have an uncontrollable oozing of blood from the gums or the stomach or the navel, or any other place, they have this tendency because their blood lacks something which ought to promote clotting. Giving them somebody else's blood often gives them the clotting substance which they need. In children transfusion is usually done for that purpose.

Q. Do you have to be sure that there is no taint of syphilis?

A. We certainly do. We always make a Wassermann

test; of course we could not do a greater injury than to use tainted blood.

Q. Can donors go through this operation several times?

A. Yes; perfectly well. We were sure in advance that this would be so from our long experience with horses and other animals. The method of making diphtheritic anti-toxin is to take the blood of a horse which has been immunized against diphtheria. Such a horse may be bled and bled at proper intervals until gallons of blood are taken out of him, yet he thrives on it. It does not even diminish his appetite, and human beings seem to do just as well.

The other primary anemia, the other anemia for which we know no cause, is one which is now getting rare. When I was a medical student we used to see many cases of it; that is, the picturesque disease called *chlorosis*, which was supposed to mean "green," the "green sickness." I remember being greatly excited with the hope of seeing one of these green patients; but they are not green, simply pale. It means an anemia of young girls, between fifteen and twenty-four, ordinarily coming on a few years after the establishment of menstruation, without any known cause whatsoever. It is as common in the rich or well-to-do as in the poor. It can be easily cured by iron. This is another of the small list of diseases referred to above which we can cure with a drug, and we can do it every time. We do not even have to rectify the patient's bad hygiene so long as she will eat a certain amount of iron. Why it occurs only in women, and why only in women at this particular age, why it is now apparently disappearing

from America, are questions that have never been answered. I have not seen a case now for several years; I used to see many every year.

So far we have been describing troubles with the red cells in the blood. *Leucemia* is a rare disease, invariably fatal, characterized by an enormous accumulation of the other chief solid constituent of the blood stream, the white cell or leucocyte. *Anemia* means too few red cells: *leucemia* (literally "white blood") means too many white cells. The blood is never white, but some imaginative gentleman thought it might be, because of the color of the clots *post mortem*. We do not know the cause and have almost no control for the course of the disease. It can be diagnosed in a few seconds from a blood specimen, and is perfectly easy to diagnose if one thinks of examining the blood; entirely impossible if one does not.

The present treatment is wholly by X-ray or radium, and this does a great deal of good in prolonging life, although it never yet has cured any one. I had a patient once who came here from Cuba, a coffee-planter; he took X-ray treatment at the Massachusetts General Hospital and was so impressed with it that he bought an X-ray machine, carried it back to Cuba and gave himself the treatment. He lived and worked there for a couple of years and then came back and died. That is about the best we can expect.

Purpura is a symptom miscalled a disease, but so common a symptom that it ought to be defined, at

least, before I leave this subject. It means spontaneous bleeding under the skin, red spots of blood appearing under the skin from unknown causes. It is a symptom of many diseases; for example, of many infectious diseases. We see, from time to time in the newspapers, that there is an epidemic of "spotted fever." "Spotted fever" is one of the many diseases that has purpura as a symptom. It occurs sometimes as a result of drugs, such as iodide of potash or bromides or salicylate of sodium. Purpura also comes in people who are badly run down from any cause; as, for example, in tuberculous or cancerous or diabetic or nephritic patients.

Purpura is distinct from another disease that belongs in this group, *hemophilia*, which is the technical term for "a bleeder," a person who tends to bleed on very slight provocation. Purpura is spontaneous; hemophilia is bleeding from some known cause as from having a tooth pulled. Patients may bleed to death from hemophilia. A slight cut may give an almost uncontrollable hemorrhage. Luckily the disease is very rare. I mention it only because it is one of the most interesting diseases from the point of view of heredity. It sounds impossible, and yet it is demonstrably true that the disease is transmitted through the females to the males. Men have it, women do not have it, and yet it is transmitted only through women — a most extraordinary state of things. A man who is a bleeder has a daughter; she is never a bleeder, but her son may be; her daughter never can be; but she can transmit it to

her son and so on. There are families where this has been followed through six or seven generations.

We are beginning to have some idea of how to help both purpura and hemophilia through transfusion. In both diseases the blood lacks something that ought to make it clot, and by supplying that we can sometimes save life.

Diseases of the Lymph Glands

Besides the veins and the arteries which carry the blood out from the heart and back to the heart, there is in the body another set of tubes, the lymph channels. They carry lymph, a colorless fluid quite unlike the blood; they go everywhere, into every organ in every part of the body, and now and then they come to a substation which is a lymph gland. Lymph glands, which are masses of lymph cells, occur everywhere, but are largest in certain familiar sites in the body — in the first place, in the throat. (1) The tonsils, the adenoids, and all the other lumps of tissue round the ring of the throat are lymph glands. There are a great many more of them than we give names to. The throat is full of them. Then (2) there is a large group on the sides of the neck which are not ordinarily big enough to feel or to see unless they are diseased. (3) There is a group in each arm pit, and (4) another group in each groin. Those are the chief groups which we can feel on the outside of the body. There are a great many more inside the body, but they do not concern us now.

Enough has been said above about the tonsils. I did not say, however, anything about the enlarged glands in the neck, which are very often seen in children. Glands swell up in the neck in response to irritations inside the mouth, and presumably represent an effort on the part of the body to kill disease. The germs of disease are carried in lymph channels until they strike a lymph gland. The gland tries to kill the germ and in the effort the gland grows larger and presumably stronger. Then we see the swollen gland and falsely call it disease. Really it represents heroic effort. If a child has a diseased tooth or an abscess about a tooth, there are very apt to appear enlarged glands in the neck. In children this is probably much the commonest cause for the enlarged glands that we so often see. They do not represent disease really; they represent resistance against septic disease, and they should not be treated unless they suppurate — unless pus forms, when it has to be let out.

Next to this type is the *tuberculous gland* in the neck, also seen especially in children, sometimes very hard to tell from the kind mentioned last, but characterized by the fact that they last a long, long time, whereas the other type is generally gone within a few months. Tuberculous glands may stay for years, but sooner or later they almost always break down and discharge slowly. In my opinion a great deal of unnecessary surgery has been done upon these glands. In the vast majority of cases if a surgeon takes them out there

are just as many there again within a short time; the proper treatment is that which Dr. John B. Hawes has emphasized so much — the treatment by hygiene, as for lung tuberculosis, and by tuberculin. If an abscess forms, of course it has to be drained, but unless there is an abscess I do not believe in operating upon them.

Syphilis produces enlarged glands in the neck which never break down or suppurate, which demand no treatment, but which help the doctor's diagnosis. *Malignant disease:* cancer and other types of malignant disease, are prone to spread to the glands of the neck, usually secondary to cancer elsewhere. Cancer of the thyroid or in the mouth or in the lung will sometimes be known first because of an enlarged gland found in the neck.

The chief thing to remember is that a gland as such does not represent anything that ought to be treated. It is only to be treated in case it suppurates, when it has to be treated like any other suppuration. When the enlarged glands do not require any treatment they do not cause any discomfort, but some people have them operated on because they do not like their looks.

Diseases of the Thyroid Gland

Diseases of the thyroid gland — one common and one rare. The common one is *goitre*, the rare one *myxedema*. Goitre may be toxic or non-toxic, that is, it may have with it symptoms of self-poisoning or none. The non-toxic goitre is simply a disfigurement, a lump at

the root of the neck in front. In some parts of the world it is fashionable and almost universal. There are some places in Switzerland where almost every woman has a non-toxic goitre. A great many operations are done for cosmetic reasons. This type of goitre has no symptoms whatever, and if a person is wearing a high collar it does not disfigure. Operation skilfully done can make things look a good deal better. It is possible to do the operation without leaving much of any visible scar and without any danger from taking out too much of the gland. Removal of the whole gland is very serious and produces the disease *myxedema*.[1]

Much more important to us is the toxic goitre, which receives a great many names. It is called (1) *exophthalmic goitre* (*ophthalmos*, the eye; *ex*, which means that the eyes stand out), prominence of the eye, which is a symptom of some cases, not by any means all. It is a bad name, because many cases do not have that symptom; (2) *Graves's disease*, from an Englishman who described it; but of course no German will allow that, and in Germany it is called (3) *Basedow's disease*. Those are the three names we hear most often. A great many times it is called *hyperthyroidism*, which of course we know now, from our knowledge of stems, means too much thyroid. That is again a bad term, because very often there is *not* too much thyroid. *Thyrotoxicosis* is, I think, the best single word for it. That means a poisoning coming from the thyroid gland.

[1] See page 311.

It is a disease of great interest in many ways. One of its most interesting features is that the patient with a well-developed case presents the physical evidences of terror. A person in terror does not necessarily show it on the outside, but if he does he will present the appearance of the patient with thyrotoxicosis. A person with this disease trembles and sweats, has a rapid heart and a staring eye, so that as you meet people with this disease they look as if they were permanently terrified. As we know them better, we see that it is just the physical evidences without the psychical side of terror. More than that, extraordinary terror sometimes produces the disease. People have been known to come out of great strains, out of battle for instance, with the disease. All of that is taken to mean that terror has an effect upon the nerves which go to the thyroid, so that when we are terrified our thyroid is overworking, and because it is overworking we have the familiar physical manifestations of the invisible psychical state, fear. When a person has been tremendously terrified the thyroid may get overworking and keep overworking. It is not quite so simple as that, however, because it is not simply overwork — it is a perverted work. It is a toxic secretion and not merely an increased secretion. Moreover, most cases have no terror as their cause, and as to their real cause we are entirely in ignorance.

The main symptoms of goitre are exophthalmos, fine tremor of the hands, nervousness, and rapid heart. Another is loss of flesh despite a good appetite and

despite plenty of food eaten and digested. There are only two diseases in which people lose flesh in spite of a good appetite and plenty of food; this is one, and diabetes is the other. These toxic goitre patients burn up their food and their tissues faster than other people and have to have more food to keep them from getting thin.

A superficial but rather useful way of making a guess at the disease is by shaking hands. As we shake hands with people we can notice various things about the hands — warm or cold, or moist or dry. The cold, moist hand, for instance, is the hand of a nervous person, and the hot, dry hand is the hand of fever; those are common. The cold, dry hand is the hand of the person who is cold. But the *hot, moist hand* is seen in this disease, toxic goitre, much more often than in any other state. The patient is apt to have a little fever and a little extra perspiration, therefore a hot, moist hand.

The disease runs a very chronic course, often lasts for thirty or forty years, and has an extraordinary tendency to get better and worse and finally better, whatever we do, and entirely without treatment in many cases. For this reason there is probably no disease for which so many medicines have been praised and so many treatments tried and given up. The reason is that a person has got better and the doctor has followed that most common of all fallacies, *post hoc ergo propter hoc*, which is to say that since an improve-

ment happened *after* a certain treatment, it happened *because* of that treatment.

I do not mean to convey the impression that I do not think treatment does any good in toxic goitre, but only that the disease has a tremendous tendency to get better of itself, and to get worse of itself. I have followed one patient for over thirty years and have seen her in the end get much better without any reference that I could see to any treatment whatsoever. The treatments in vogue at the present time may be said to be three: In the first place, the easiest thing to do, and the thing which will always help mild cases, is to put the patient to bed for two or three months. This is a pretty stiff treatment, but it will almost always make the patient better, and it may be all that is necessary. Indeed, it may do just as much good as a surgical operation. What the surgeon generally advises is to try medical treatment first, and if it fails, then surgical treatment. We should try rest thoroughly first. Nowadays we also advise patients to try X-ray. We are very much interested just at the present time in a large series of cases getting X-ray treatment and nothing else. They are most of them improving, perhaps because of X-ray, perhaps in spite of it. The surgeons are getting a little indignant with us, but we respond that the patients are most of them getting better and that hence we do not see any present reason for surgery. It may be that they won't continue to get better, but so far we are feeling very much encouraged. X-ray

will decrease the function of many glands, and if this disease is in part overwork on the part of the thyroid, it is perfectly reasonable to think that X-ray may help.

If rest and X-ray fail we have as a last resort operation, which has helped a great many people. The operation consists of removing part of the gland, or tying some of the blood vessels which take blood to the gland, so as to make it shrivel up in part. That operation has a real place, I think, provided people do not rush to it as the first thing instead of the last thing to be tried. If no treatment is given, the disease may get better, but may get steadily worse, and people may die of it. They usually die of cardiac failure. The heart pounds away and finally wears itself out.

Myxedema is so rare a disease that I should not mention it at all if it were not for the distinctive fact that it is one of the eight or nine diseases in the whole of medicine that we can really cure with a drug. It is a disease that comes when the thyroid does not do its work, atrophies. The same disease in a child is called *cretinism;* a cretin is a child whose thyroid does not work. Myxedema occurs usually in women, but occasionally in men also. The cure is simply feeding the individual with dried thyroid gland from an animal. It is one of the most characteristic instances of how animals help us. They give us what we need here, and it seems to do just as well as a human thyroid — the distinction between a sheep's thyroid and a human thyroid does not make any difference. A doctor who

recognizes a case of myxedema can consider his fortune made. The patient who has been going down and down proceeds to get entirely well; she naturally tells every one, and the doctor's reputation sprouts. It is a disease that the doctor prays that he may see. Naturally, after treating the vast number of cases that we cannot cure, we are rather hungry for a few that we can.

Myxedema looks like obesity plus stupidity. The placid and "cow-like" expression of the patients has been often spoken of. They are troubled with dry skin and rapid loss of hair, gain flesh rapidly, and lose their mental and bodily activities, without any special organ being singled out. They may become absolutely bald in a short time, but the hair all comes back as soon as they are fed thyroid extract. Of course they must take thyroid extract for life, but once the proper dose for the individual is found it is not much bother to take the tablets.

Diseases of the Bones and Joints

Tuberculosis of the bones. I said at the outset that I should omit tuberculosis of the lungs because it is so familiar; but bone tuberculosis is not so much talked about. The commonest form is hip disease. There are practically only two kinds of hip disease, the tuberculous type and one other that comes in old people. So that hip disease in young people is practically always tuberculous. The only exception is congenital hip

disease, where the hip is out of its socket when the child is born.

The first thing to be said is that hip tuberculosis ought to get well; it is an entirely different prognosis from tuberculosis of the lungs. Death from tuberculosis of the hip joint usually means poor work somewhere, provided of course the patient has no tuberculosis elsewhere. The disease shows itself by a limp and by a stiffening of the back and muscles around the hip. The favorite doctor's test for it is to throw a bunch of keys on the floor and ask the child to pick them up. The child gets down with a stiff back which is very characteristic. In an older person it would not be so important, but in young children this is a useful diagnostic sign. Before long fever appears and the familiar results of fever, loss of strength, loss of weight, loss of appetite. If no treatment is given, or sometimes even when it *is* given, the tuberculosis which starts in the head of the hip bone begins to burrow out and appear as abscesses about the hip. The pus goes five or six inches before it reaches the surface. The abscesses finally do reach the surface and form what are called "cold abscesses." These are abscesses of tuberculous pus mixed with the ordinary type of inflammation. It is a long-standing disease, lasts for years, but ought, as I have said, to get well.

The treatment involves fixing the joint by apparatus, an arrangement whereby the child can walk without touching his leg to the ground, a complicated splint

which surrounds the leg in such a way that the leg hangs free and yet has something like a stilt on the ground. We see many children hopping around with these splints and getting the outdoor air that they need. Besides this local treatment they need all that the tuberculous lung case needs of rest, outdoor air, and food. A good deal of interest just now is centred around the use of sunlight — the direct exposure of these children to sunlight, one portion of the body after another being stripped and tanned in the sun. If we expose bacteria to sunlight it will kill most kinds. It is not the heat of the sun, but something in its chemical action that kills them. The present idea is that the sunlight penetrates much more deeply into the tissues than we used to think, and perhaps kills tubercle bacilli or encourages sound tissue in the deeper parts where the disease is.

Q. Has not that been proved to be true with pulmonary tuberculosis?

A. It is generally believed that sunlight is of value to patients, and yet the climate in which more cases recover than any other is one of the most sunless of climates, Saranac.

Q. Do you have cold abscess only in tuberculosis?

A. Yes. We may make a mistake and think we have it in something else, but cold abscess is supposed to mean tuberculous abscess.

Tuberculosis of the spine, or Pott's disease. Mr. Pott is responsible for two diseases, being also associated with a certain common fracture of the leg, *Pott's frac-*

ture, which must not therefore be mixed up with Pott's disease of the spine. The greatest possible honor for a physician is to have his name associated with some loathsome disease. Pott's disease of the spine is tuberculosis in the vertebræ and is the cause of hunchback. A hunchback is a person who has had an untreated and yet arrested case of tuberculosis in the spine. It develops in the vertebræ and telescopes them, so that the person is generally shorter as a result, and if it is not recognized early the spine bends out backward and forms what we call "a knuckle." This is quite different from lateral spinal curvature; it is a sudden backward bend and quite a sharp bend. The diagnosis should be verified by X-ray. The most expert won't say whether a given prominence is tuberculous until he has an X-ray which shows very clearly a focus of disease in the bones of the spine. If it is recognized early there will be no hunchback, no considerable prominence, and what little there is can be made to disappear as a result of treatment. All the most terrible results of this disease are due to its not being recognized and treated, for this, like hip disease, ought to be cured.

Q. How long has that been true?

A. It has been true now I should say for something like twenty years, more true in Boston than elsewhere. Boston is the home of advanced orthopedic work and people have come here from all over the world to see the work of Dr. Bradford and the older orthopedists. The Bradford Frame is an arrangement for keeping a child with spinal disease in right position for the best healing of his disease.

The treatment is essentially the same as in hip disease. We strive to keep the diseased part quiet to prevent the grinding of the bones one upon the other, to keep the patient in the fresh air, to give him an abundance of food, and, I guess, of sunlight. What we are always afraid of is that there will be tuberculosis of the lungs which has not been recognized. If it is only in the spine we have good hopes of the future. When the disease recovers, the person has a stiff back in that part of the spinal column which has been affected, and sometimes is admired for his military carriage.

Tuberculosis occurs also in the ribs and less often in the bones of the arm, also in the bones of the leg, but much less often than in the spine and hip. Wherever it is it produces a cold abscess, an abscess without fever, very slow in its course, an abscess which when probed is found to lead to a diseased bone. Any doubtful case is always examined by X-ray to see whether the bone is affected. Tuberculosis in the ribs or the wrist is treated in exactly the same way that I have spoken of in relation to the hip and spine, except that the problem of procuring rest is not so serious.

The knee-joint and ankle-joint are both affected by tuberculosis, and both treated by rest and hygiene, but the results of healing — a stiff joint — are much more serious in the knee than in the spine.

These are all long-standing cases. Any social worker dealing with tuberculosis of a joint knows that he is concerned with a chronic case, and yet a hopeful one. It is expensive and will take a long time, but the time and money will be well spent, much more so than in

tuberculosis of the lungs, in kidney disease, or in arteriosclerosis. I always feel that a social worker who is in touch with tuberculosis of the bones under conditions where he can really do something, has a very hopeful and really encouraging piece of work.

Syphilis of the bones, like tuberculosis, has certain favorite spots. No one knows at all why tuberculosis picks out the hip and spine especially, and no one knows why syphilis picks out the forehead. The forehead and the shin-bone are the two places that syphilis most often strikes. Tuberculosis is almost never seen on the forehead, but a long-standing abscess leading into the bone on the forehead means practically one thing only. The diagnosis is by Wassermann reaction, by history, and by X-ray. In doubtful cases of syphilis, X-ray of the shin-bone, even when it has been healed long ago, helps us in something the same way that the Wassermann test does.

There is no direct surgical treatment; the drug treatment is the same that we always give to syphilis wherever it may be. There is no reason why, under proper treatment, syphilis of the bone should not recover, and in general it does.

Syphilis of the joints generally presents the picture of acute rheumatism — hot, swollen, painful, tender joints, plus a positive Wassermann reaction. This disease is now recognized, as it rarely was until we had the Wassermann reaction, and is cured by anti-syphilitic treatment.

Rickets is a disease of the bones of children; and *only of children*, although its effects last on into adult life. In spite of an immense amount of work done upon it, nobody knows its cause. Negro children have it with tremendous frequency, and it seems to occur a little more often in the poor than it does in the rich, but I have seen rickets in the most healthy and well-to-do families; I have seen it in a newborn baby who could not have been fed wrong because he had never been fed at all; so that I think there is still a good deal to learn about rickets. We have a general belief that it has something to do with bad hygiene. The bad hygiene is there anyhow, and we might as well work against it, whether it has anything to do with the rickets or not.

Rickets, like other diseases, has certain bones that it is fond of, namely, the bones of the head, ribs, forearms, pelvis, and legs. It hits all the bones of the body, but these most. The rachitic head is the so-called intellectual forehead. There are many familiar scholastic figures showing it in this part of the country. A person may have a very capacious brain in spite of rickets, but there is no special connection between what you see on the outside and what is on the inside. In a baby the rachitic head is much more striking because the rest of the body is so small. The head may be bigger than the chest. The forehead, as I have said, especially bulges out and the openings on the top and back of the head which are present in the newborn baby do not close, or

close very late. The soft spots remain there long after they ought to have hardened up. This is characteristic of rachitic bones everywhere. They are too soft and they hinder growth. As soon as the baby begins to creep, to put his arms down, the soft arm bones begin to bend and bow outward, and as soon as he begins to walk he begins to get bow-legged or knock-kneed. The rib bones, about one inch outside the breast bone, have a series of enlargements, like a string of beads down the chest, to which the term "rachitic rosary" has often been given.

I have spoken of rickets as a disease of the bones because it is in the bones that we see the most obvious changes, but it affects also the muscles. The rachitic child is pitifully weak in all his muscles. This weakness is often mistaken for paralysis; but the baby is not paralyzed, only the muscles are very flabby. As a result of the flabbiness of his abdominal muscles the gas which is normally present in his intestine distends the abdomen until it becomes very prominent. We see very "large stomachs" on most rachitic children. The rachitic child often has fever, and in his febrile spells, especially at night, often sweats a great deal. He is also a very restless child, and we often find that from his wriggling the hair is all worn off the back of his head. His mother often is quite sure that he has worms, and when we ask why, we find that it is because he grinds his teeth, which is well recognized among mothers, although not among physicians, as a

symptom of worms. If a child grinds his teeth and scratches his nose and has a big appetite, these are supposed by mothers to be symptoms of worms, though none of them has anything whatsoever to do with worms.

Rickets gets well of itself in the vast majority of cases. That is very disconcerting sometimes. The bow-legs, for instance, for the cure of which the orthopedic physician has got the social worker to persuade the parents to buy costly apparatus, straighten out of themselves in many cases, and the mothers and fathers, from their experience with previous babies, are very apt to know that beforehand, and hence are very skeptical in taking our advice. Why this spontaneous recovery occurs we do not know. It does not occur in every case, otherwise we should see no bow-legs. But the fact that we do not see *more* bow-legged adults is very significant in view of the fact that almost every child is bow-legged at some time and in some degree.

The thing to work at is the diet. We advise a diet with the proper amount of fat, which is apt to be left out, and try to improve hygiene in other respects, but I do not think we yet know much about it. The only danger of the disease is that it weakens the child generally. He is more likely to catch any disease that is going, and hence a great many of these children die of pneumonia or of some germ disease when they would not if they had not had rickets. It is a fair guess that

the cause of rickets will finally be proved to be in the ductless glands.

Questions and Answers

Q. When the cartilages change to bone, would that be the time when the bones straighten out?

A. I do not see how it can be. That change is going on through childhood and into adult life, way into the forties and fifties. In the ribs the ossification of cartilage goes on clear up to the time of death.

Q. Can you straighten the limbs by rubbing?

A. Not so far as I know. They can be helped by apparatus and by operation; I should not suppose that rubbing would do much.

Q. Can rickets be avoided by prenatal care?

A. I do not know any evidence by which I can answer that question. Prenatal supervision has not yet been carried out on a scale large enough to give us any knowledge as to its power to prevent rickets.

CHAPTER XIII

DISEASES OF THE BONES AND JOINTS (CONTINUED) DISEASES OF THE MUSCLES

ANY one who sees a patient with a *fracture*, and wants to do what he can in the way of first aid, has a very definite duty so far as he can perform it, which is to put a pillow around the affected part. The essential thing is to put the arm or the leg down upon a pillow lengthwise, pull the pillow up around it and bind it on tightly. That makes as good a splint and as comfortable as we can improvise. When a leg has been put in a pillow in that way we can take hold of the folded ends of the pillow above the leg and lift the leg by the pillow in a way that is much more comfortable to the patient than anything else we can do.

It is important to recognize that there is no good diagnosis of fractures in modern times except X-ray diagnosis. We see a good many fractures which are not diagnosed in that way, but we see their ill results also. If the patient can possibly get to a place, therefore, where a good X-ray diagnosis can be made, that is what is to be desired.

The long time which has to be allowed for the healing of a fracture is, I suppose, familiar to most of my readers. We have to allow three to twelve weeks.

That is about as well as I can put it for the full healing of a fracture. It should be added, however, that if the fracture is properly set, the leg or the arm is just as strong as it was before. The fractures which are the most likely to leave trouble are the fractures of the wrist. Colles's fracture of the radius is, if not set just right, very apt to leave some stiffness and deformity of the wrist. A good deal can be done for that by massage or by passive motion. It is a bad disability in a case not properly set.

Fractures of the thigh are sometimes bothersome to treat because of the difficulty of keeping the two ends of the bone together. The upper end of the bone is pulled up by the psoas muscle and fastened in position, and in consequence we find, quite usually in children's hospitals, a baby with his heel pointing to heaven, — his leg supported perpendicularly, — as that is the only way the two ends of the bone can be kept together. The child gets perfectly used to it, and can sleep in this position.

Fractures of the skull are a very common cause of death in accidents and after falls. The evidence necessary for the diagnosis of fractured skull is often hard to get. There is usually a big bruise on the outside, and through the bruise the doctor can feel nothing. Here again X-ray is the essential thing. X-ray shows up fractures of the skull which are impossible to feel, and impossible to detect by any other method. I am sure we have made many wrong diagnoses for lack of this

help in the past. I refer now to fractures of the vault, the upper part of the skull. It is essential that fractures of the vault of the skull should be diagnosed, because if the broken bone is pressing upon the brain the pressure may be relieved and can be relieved by an operation which lifts the bone. About as common are fractures of the base of the skull, in which the most important evidence is bleeding from the ear. In a person who has had a fall upon the head and bleeds from the ear, there is probably a fracture of the base of the skull. These are very serious and most of them fatal.

I have spoken of the necessity of X-ray in fractures. Of course it is equally essential in injuries that *may be fractures*, that is, in bad sprains. It happens again and again that an injury is treated as a sprain and does not heal; later X-ray shows that it was a fracture unrecognized. Sprains that are more than usually serious, or that do not heal properly, should always be suspected of being fractures and should be X-rayed.

Joint Disease

Arthritis is a very general term, includes all types of joint trouble, and is not in itself serious. There are very slight forms of arthritis; a sore joint means the same thing in less formidable terms.

We recognize five types of arthritis, with some subdivisions under those main types:—

(1) *Infectious arthritis*, due to a germ.

(2) *Hypertrophic arthritis*, which means arthritis with an overgrowth of bone.

(3) *Atrophic arthritis*, which means that the bone shrivels or goes to pieces, so that the ends of the bones telescope into each other.

(4) *Gouty arthritis*.

(5) *Traumatic arthritis*, that due to an injury.

In the Out-Patient Department of the Massachusetts General Hospital there were treated in 1915: —

Infectious Arthritis	372 cases
Hypertrophic Arthritis	122 "
Atrophic Arthritis	7 "

Subdividing *infectious arthritis*, which is far the commonest, — fully three times as common as any of the rest, — we have in the first place one type which we have already dealt with and finished, *tuberculous arthritis* — tuberculous joint disease. Then we have the acute *streptococcus arthritis*, which we call *rheumatic*, a rather uncommon disease, although the term is very frequently used for what is not rheumatism. Acute streptococcus rheumatism is the same as rheumatic fever. It is the type which I have already mentioned as associated with heart trouble, and with tonsillitis, and with pus foci about the teeth or anywhere else. This is an acute, self-limited disease, has a beginning, middle, and generally an end within a few days or weeks. The best thing that we have to say about it is that, while it may be very painful, *it leaves the joints sound in the end.* It does not cripple the

joints. We are accustomed to hearing of people "crippled by rheumatism"; they are not; they are crippled by something else. Rheumatism passes off as an acute attack and that is the end of it so far as the joints are concerned. It may recur, especially if we have not got rid of the foci in the teeth, tonsils, or elsewhere. But it is in the heart that we are most afraid of the streptococcus. The group of drugs called the salicylates, or aspirin, which is a first cousin, give us great relief of pain in this disease. They do not cure it; they do not shorten the duration of illness; they do not protect the heart; they do nothing except check pain; but that is a good deal. They have been a great blessing to us, making it unnecessary to use morphine and such drugs, as was formerly the custom.

This type of disease may be of any degree of severity, from a little joint twinge to a very painful illness lasting weeks. Any infectious disease may attack the joints, but the only common causes are the germs of rheumatism, of gonorrhea, and of syphilis.

Gonorrheal arthritis is only one type of infectious arthritis, but differs so much from the rest, and is so characteristic, that we all ought to know something about it. It is often called "gonorrheal rheumatism." I have tried to indicate that the word "rheumatism" ought to be kept for one rather uncommon disease due to a streptococcus. Two to five per cent of cases of gonorrhea have an infection of the joints as part of their course. *As a rule it is confined or severest in one joint,*

or at most in two, whereas rheumatic arthritis in the strict sense is practically never confined to one or two joints, and attacks a dozen or more in almost every case. Gonorrheal arthritis rarely begins in the fingers or toes, but generally attacks a large joint, such as the knee or the ankle; rheumatic arthritis generally begins in the fingers or toes. Gonorrheal arthritis is a very slow, tedious affair, and although the bones themselves are not at all affected, the tendons around the joint may be inflamed enough to leave some stiffness in the end. It is much more serious in its results than the rheumatic type, and much slower in healing.

Q. Which type do they treat with serum?

A. The gonorrheal, but this treatment is not widely used now because we do not any longer believe that it does any good.

Hypertrophic arthritis, the next most common type, is a disease of people past middle life, — one almost never sees it before forty. After forty it is the commonest and most harmless type, a fact which it is of importance for us all to know. This is the type that makes the last joints of the fingers enlarge. It is usually confined to those joints, gives little pain, and aside from appearances is of little account there.

In horses this disease is called "ring bone"; it produces stiffening. If we try to bend the joint, before long the end of this projecting bone will strike the end of the next one, and prevent the part from bending as it should. When this happens in the fingers we call

it *Heberden's nodes*, and make light of it. But in other bones it has more serious consequences.

In the knee joint exactly the same disease confronts us, and is of a great deal more importance. It produces pain and stiffness, and from time to time a pouring out of serum, called "water on the knee," from the banging of one of those projecting bones against another. In the hip joint this gives more trouble still, and makes there what is called the "old man's hip disease." The young man's hip disease is tuberculosis; the old man's hip disease is just this. The hip joints into the pelvis at a right angle, and at the end of the joint, where it ought to fit in, this overgrowth occurs, pries the hip out of its socket, and so makes it impossible for it to move freely in its socket. There results a stiff, painful hip which may cripple the individual a good deal.

We see this same disease also in the spine; there it causes a stiff back with more or less pain, pain following the ribs, because these spicules of bone press upon nerves which run along parallel to the ribs. It is in this field that the osteopaths have the grain of truth in their theory that the misplacement or pressure of bones upon nerves is the cause of all disease. As with homeopathy and many other theories of true but limited application, the trouble comes when one attempts to apply it everywhere. The osteopaths do, nevertheless, a deal of good; their theory is wrong, but their practice helpful in well-selected cases.

In very serious cases of hypertrophic arthritis in the hip, an operation is done to chisel off the projecting pieces of bone. This is not so far a very successful operation, but sometimes better than nothing. Elsewhere in the body medical science has not yet found anything effective to do about hypertrophic arthritis. We support the spine, and give some relief by preventing the movements of bones upon one another, but we do not cure it anywhere. It is a long-standing disease; people often have it twenty years or more.

The next variety, *atrophic arthritis*, is very fortunately rare. We had in 1915 at the Massachusetts General Hospital only seven cases as against four hundred and ninety-four of the other types. It is the most crippling, the most terrible of all the forms of joint disease. It starts usually in the second joints of the fingers, and causes "spindle fingers," usually in young people, more often in girls than in boys. Starting in the knuckle joints it progresses toward the centre of the body. When it gets into a joint it never leaves it, and when it has been long in a joint it always stiffens it, locks it, and in the end we may get general ossification — the "ossified men" such as are shown in circuses. It may lock the jaw so that the patient cannot open his mouth and must have his teeth out so that he can be fed. Treatment makes not the slightest difference. Luckily it is very rare; we have not any idea of its cause.

It is these last two types, then, that make the crip-

pling joint troubles; the last terrible, the first bothersome.

Q. In which of these classes belong the people who are fast in chairs for years?

A. To the last I should say; the people who can't do for themselves, have to be fed.

Q. What is it that atrophies?

A. The joint itself; the bones telescope. In long-standing cases the hands are drawn out of shape and you get the "flipper hand" which in any almshouse you see so much.

Gout is a rare disease; I have not seen a case to recognize it in three years. I am speaking now of America; if we go to England we can hear it upon every one's tongue, and there we are asked to believe that it is a very common disease. I always warn people going to England that if they have any disease over there, they will be sure to be told that it is gout, but that they must not believe it. One hears in England of gouty asthma, gouty kidneys, eczema, etc. There is no scientific basis for these terms at the present time. Gout means a disease of bone and of tendon. Diagnosis can be verified only by X-ray. We do not know its cause; it is always associated in the minds of the laity with high living, especially with port wine, but we do not know this to be true. I have seen gout in the most abstemious maiden ladies. It is probably hereditary, and the in-breeding of families makes it come down in a certain line. As we know from literature, it is prone to attack the big toe, coming on with furious pain in the night, easing up the next day, worse again the next night, and

so on for four or five days, after which that particular *attack* is gone. That is acute gout.

Chronic gout is the deposition in the joints of what are called "chalk-stones," the bi-urate of sodium, which grows out in under or through the skin, so that there is a tradition of a gentleman who could write his name on the blackboard with the chalk in his fingers. These chalky deposits also appear in the lobe of the ear. They are hard, gritty, different from anything else, and easily recognized.

The disease is very intractable. Treatment is unsatisfactory.

Traumatic arthritis, or the inflammation about a joint from injury, is the ordinary "water on the knee," but we see the same thing in the elbow, the ankle, or the wrist, if there has been injury to these joints. A wrench or a blow starts up the irritation in the joint and serum is poured out, the joint swells and fills with fluid.

Q. Is that the same as the synovial fluid?

A. Yes. It is an excess of the synovial fluid, the lubricating fluid which is in all true joints.

The only important thing, I think, to be said about this disease is that, under modern treatment which does not confine the patient to bed in a plaster cast, its duration is now much shorter than it used to be. I can well remember in my childhood that the family drew very long faces in cases called "water on the knee."

The same thing is now treated by keeping quiet for a few days, and the person is then advised to move, because moving helps the circulation and so helps the healing. I do not know any disease in the treatment of which we have made more progress of late years. The joint should not be kept quiet long and must not be put in a plaster cast; it is much better for exercise after the first forty-eight hours. To relieve pain in any such injury one tries heat and cold, and only by experiment can one tell which will help the individual sufferer most. I should say that the majority get more relief from heat. That is the only treatment necessary, although if the pain is severe the patient may need some drug for the control of it for the first day or two. After that the joint is strapped with adhesive plaster and the patient is advised to use it cautiously, but in spite of pain.

"Villous Arthritis" is a term often used. It refers to the fact that *villi* or fringes of joint membrane may develop profusely in the course of any chronic joint-infections, hypertrophic or other. Villous arthritis is not a separate type. The *villi* are sometimes troublesome and operations for their removal are done with tolerable success.

Questions and Answers

Q. Is hypertrophic or atrophic arthritis hereditary?

A. Not so far as I know; I have heard no good evidence that either of these is hereditary.

Q. What is *arthritis deformans?*

A. It is not a good term; it means any type of arthritis which ends in a deformity. Gout produces deformity; hypertrophic arthritis deforms the fingers and the hip; but the most fearful deformities are generally those due to atrophic arthritis. We cannot tell from the term *arthritis deformans* what disease we are dealing with.

When we hear that a person has "arthritis," we know almost nothing except that there is something wrong in his joints, which may be anything from a slight annoyance to a crippling disease. We always need to know what is the type of arthritis and often we cannot find out, because there has not been an X-ray, and without an X-ray no human being can tell. There is no field of medicine in which X-ray is so essential as in disease of the bones and joints. X-ray of the infectious type shows nothing in the joints; the bone is all right. The second type shows the outgrowths which I have sketched, and the third an atrophy and telescoping of bones.

Osteomyelitis, or inflammation starting in the bone marrow, is of two types, the *septic* and the *tuberculous*. The tuberculous we have already covered well enough in what I have said about tuberculosis of the bones and joints. *Septic osteomyelitis* is chiefly a disease of children. I do not know of a case that has begun in a person past thirty years; the great majority begin in boys under fifteen. They constitute one of the enormous group of cases miscalled "rheumatism," and mistreated in consequence. The boy has a pain about a joint; if it is not called a "growing pain," it may be called "rheumatism," and if it is called either it is apt to be neglected, for the treatment of these things is surgical and should be begun early if it is to be success-

ful. Pus forms deep in the bone near a joint, and the pain from it may be intense.

If it is diagnosed and promptly treated by cutting down and letting the pus out, it may amount to little. If, as is unfortunately common, it is not recognized, one of two things happens. Either it spreads into the blood with fatal blood poisoning, or more commonly it burrows about in the bone and eats out the bony tissues until a large part of the shin bone or the thigh bone may be honeycombed along the track where the pus has worked its way. In ordinary hospital work what we see are the end-results. Years before a child has had acute neglected osteomyelitis, and the pus has finally worked its way to the surface, leaving a discharging sinus — that is, an opening leading from the skin down to the bone. An operation is done, the dead bone is chiselled out, and in favorable cases the whole thing heals up.

More often the trouble recurs, and operation after operation is done. Ten or a dozen operations are done on the same child sometimes, in the attempt to get rid of this trouble. If the child survives his earlier years, he is apt to outgrow the disease; that is, the suppuration is apt to heal up if he can get by the twentieth or twenty-fifth year. These are very tedious, disappointing cases, with chronic invalidism for years, and yet never hopeless. At any time the child's vitality may get the best of the infection, or a final operation may stop the trouble. Very interesting operations are done

in replacing one bone with another. Bits of bone are taken from a healthier individual or animal, sometimes, or from another part of the same individual, and put into the place where he needs bone. This is all still in the experimental stage. The disease is generally confined to one bone, and does not appear in other places, but we cannot make an absolute rule about that.

Sacro-iliac Strains or Sprains — Loose Sacro-iliac Joint

The lowest piece of the spine above the coccyx is composed of several vertebræ fused into each other to make a single bone, called the *sacrum*. That bone fastens on each side to the pelvis, by an irregular unsatisfactory joint which is not well supported and which is very apt to get into trouble one way or another. Exactly what happens to it I do not think any two people are agreed. Something happens, strains or sprains or slipping or loosening, whereby there is often much pain around that region. A good deal of backache and many cases falsely called lumbago are due to sacro-iliac lesions. (*Lesion* is the most indefinite of terms. When I speak of a sacro-iliac *lesion*, I mean that I do not know — I am doubtful if any one knows — what the trouble is.) The probability is that all the troubles of other joints occur there, all forms of arthritis, all sprains and injuries that happen to other joints, but it is a joint very difficult to examine by X-ray or in any other way, so that we are very seldom able to say exactly what is going on. In some cases there is an obvious strain: a

man takes a trunk on his back, for instance, feels a sudden pain, a sense that something has given way, and at once feels a severe backache. In such cases we feel pretty sure that the bones of the joint have slipped past each other. In other cases there is no such history; a person just begins to feel pain in the sacro-iliac joint. A good many women have it after childbirth, and then it seems that there must be some stretching of the bones in the process of parturition. Occasionally when a doctor takes hold of the pelvis he can move the joint, — it should be impossible to move it, — and feel that there is a loosening or slackening in it.

The disease is greatly helped by the right kind of support, and is not helped at all by drugs. We often do not know exactly what is the matter but we do know what to do, namely, to give the joint the right kind of support — by strapping with plaster or by the right kind of belt, or by the right kind of corset. Of late years corsets are more and more used, but of course the distinction between a light belt and a heavy corset is not important. All these press the pelvis inward from the sides so as to prevent free motion of the sacro-iliac joint.

In a good many cases this sacro-iliac trouble is linked up with sciatica; that is, with pain down the back of the leg. We used to say that the sciatic nerve was in some way pressed upon by a dislocation of the sacro-iliac joint. That has not, I think, been shown to be true, and the best we can say is that the two, sciatica

and sacro-iliac lesions, are often in some way related, and that the treatment of the joint by strapping or corsets may help the sciatica very much.

Scoliosis is a term usually reserved for very severe cases of spinal curvature combined with twist; the spine is both curved and rotated upon its axis. This is to be distinguished from the less degree of curvature which people often do not discover and which often should be discovered or treated. Scoliosis is a severe disease and must be treated. Scoliosis seems usually to be due to some congenital change in the bones, something wrong in the way the bones are made in the bottom of the spine. We can get at this by X-ray. Scoliosis has no relation to any infectious disease, to any disease of the heart, lungs, or to tuberculosis. It is apparently an anomaly of the bones themselves. If nothing is done, the tendency of the disease is to get worse.

It is treated by an attempt to straighten the spine, or at any rate to prevent it from getting more and more curved. That is accomplished, so far as it can be accomplished, by jackets and supports, which bring pressure upon the side that bulges out. The treatment is painful, wearing, and tedious. I have no reliable knowledge of the present attitude of orthopedic physicians as to the results of this treatment; I know that of late years they have been somewhat uncertain about its value. Social workers should know that it is very important to find out, before we urge a prolonged and

expensive treatment, whether the patient will stick to it. There are people who will wear a scoliosis jacket and people who won't. I suppose, in a general way, it is the more phlegmatic, patient people who will wear a jacket, and the more nervous people who will not. It is hard to tell, but we often can judge from our knowledge of temperament whether the patient will wear a jacket or not. After a certain number of these plaster jackets have been put on and taken off again, one finally comes down to some sort of permanent apparatus which the person wears more or less steadily for life.

Pronated Feet ("Flat Foot")

Flat foot. Although muscles and ligaments have more to do with flat foot than the bones themselves, it is convenient to include it here.

When the muscles that should hold the foot straight are too weak, the ankle slumps inward, the inner ankle bone comes too near to the ground and the ligaments (unable without help from the muscles to hold up the foot) stretch so as to let the bones become displaced. There results pain in the instep or on the inner side of the foot. Walking and standing increase pain. This pain may spread up the leg, even above the knee.

Apparently, then, the whole trouble starts from weakness in one set of muscles. These in turn may be weakened by germ diseases (like rheumatism), by over-

use, by strain of great weight (obesity) on them, and by a good many other causes which we do not know.

The treatment should be supervised by an orthopedist. Muscular exercise, proper shoes, and sometimes plates are the main remedies.

Bunions. When people's feet grow out of shape, largely as a result of bad shoes, the rubbing of the shoe upon a projecting knob of displaced bone (oftenest at the base of the great toe) results in an inflammation when the friction is most severe.

The treatment is *proper shoes* — giving room enough for the toes without cramping them. This will prevent most cases and will give reasonable comfort even after the bunion has formed — provided we are not too squeamish as to appearance and are ready to make room for the excrescence.

In an extreme case an operation may be done, but the amount of bother attendant on the operation and its results is sometimes greater than the annoyance of the bunion itself.

Diseases of the Muscles

So large a portion of our body is composed of muscle that it is rather remarkable that there are practically no diseases of the muscles that we know anything about — indeed, there is only one disease that is well understood, *trichiniasis.*

Trichiniasis is the disease that we may get if our pork is not properly inspected when it is killed. It is to

avoid this that our Government goes to the trouble and expense of inspecting pork. People who eat pork, especially those who eat it raw or partially cooked, are more or less liable to trichiniasis. Until our inspection is a good deal more perfect than it is yet, this will always be so. People get trichinæ from sausages now and then, because they often contain a good deal of uncooked pork. The trichina is a little worm which gets into the muscles — hundreds or thousands of them scattered all through the body — and produces a good deal of fever with soreness and tenderness in the muscle, which, with the characteristic changes in the blood, ought to make diagnosis clear. Possibly salvarsan may help. Otherwise we have no treatment; we have to stand by and look on until the patient is better. Recovery is almost always complete, but takes months.

We know of no such disease as "muscular rheumatism." The laity know it well, but the physicians do not recognize it. There are all sorts of muscular pains. Probably the commonest is *stiff neck*. Most of us at some time have felt over the side and back of the neck and down toward the shoulders, a stiffness with pain which is apparently in the muscle. Nobody knows what it is nor what causes it. Damp weather seems to bear some relation to it. It goes off within a few days or at most a week or two. It is benefited by heat and by massage, and that is all we know about it. Precisely the same disease, when it attacks the muscles lower down in the back, is called *lumbago*. People often

have the two together, and that makes it easier to differentiate this from other diseases. Any such pain that persists longer than a week or ten days is probably due to some disease of the bones or joints.

Animal Parasites

The commonest of these is *tapeworm*. In most parts of the United States we see only two, the tapeworm that grows in beef and that growing in pork. Beef tapeworm is what we see in ninety-nine cases out of one hundred at the Massachusetts General Hospital. The first and most important thing to be said about both is that they are entirely harmless, so far as we know, and produce no symptoms whatsoever. The patient finds out his disease simply by discovering the worm in discharges from the bowels. The symptoms of worms is one of the subjects on which the laity has clear but wholly false ideas, — the idea, for instance, that the tapeworm patient has a ravenous appetite in order to support himself and the tapeworm, and the other popular belief that if a child scratches his nose or grinds his teeth in his sleep, he must have worms. None of these things is true. There is a popular æsthetic prejudice against harboring these animals indefinitely in our intestines, and there is no reason why we should not be rid of them, since they are very easy to cure. As a rule it does not pay to try to cure them at home. We do not treat them as out-patients at the Massachusetts General Hospital, but send them into

the wards for forty-eight hours, within which time we can generally rid the patient of his worm. We give a medicine which is very distasteful to the worm, whereby he releases his hold upon the intestine; then we give a purge and sweep him out.

There is another tapeworm, the *fish tapeworm*, never seen here except when imported, usually from Norway or the Baltic provinces of Russia. This worm does produce very severe symptoms, sometimes an anemia of the severest type, which if not checked may be fatal. But it is perfectly easy to kill this worm by medicines given by mouth. When we are trying to swell the very small list of diseases which we can cure, we always put in tapeworm which we *can* surely cure with a drug.

Pinworms. The tapeworm is anywhere from ten to twenty feet long. The pinworm is one half to one inch long, a minute, threadlike creature which settles down in the lowest segment of the bowel and causes itching with local irritation, especially in children. It is harmless except for the local irritation, and can easily be expelled by the application of astringent solutions.

Another species, the *round worm*, is about six inches long, looking like a large earthworm, also perfectly harmless, often vomited or passed by foreigners, especially Italians. It causes no symptoms, but sometimes alarms the patient and attendants. It is easily expelled.

The only worm that most of us have often heard of is the *hookworm*, which in the Southern States of this

country is a very serious scourge. Up to 1898, when one of our army officers, Dr. Bailey K. Ashford, discovered the presence of hookworm in the Spanish peons of Cuba and Porto Rico, it was supposed to be unknown in the Western Hemisphere. We had known of it only in Cornish and Swiss miners. Yet there is every reason to suppose that it has always been here, and when the American Government occupied Porto Rico, about nine tenths of the whole population was found to be affected with hookworm.

Hookworm causes a more or less severe anemia, sometimes fatal, usually not fatal but very debilitating; hence the newspaper tales about the "lazy bug." It makes people unable to do their work. My brother was impressed in Porto Rico by visiting a town before and after the American hookworm brigade had organized a camp hospital and invited the whole population to come and be treated free. He was there before and after this treatment, and those who employed labor told him the working force of the town had increased forty-five per cent as a result of cleaning the hookworms out of the population.

After that Dr. Stiles, of the United States Department of Agriculture, began to look in this country for similar worms, but for a time the pride and stubbornness of certain people made it very hard to prove the prevalence of hookworm disease in our Southern States. At the present time, however, it is generally admitted and widely found, but is being rooted out.

It is a disease which has no possible right to exist, for we can both prevent it and cure it. We can prevent it by persuading people to wear shoes, and to use privies. We can cure it with a dose of thymol. One of the most bizarre things in medicine is the way it gets into the body. It is an intestinal parasite, yet it gets in *through the skin.* In Southern States a considerable part of the population walk around barefooted, and get what they call "ground itch," a local irritation especially between the toes, due to the local action of the hookworm embryo on his way in. He gets in through the skin to the blood, and travels all the way across country to the intestine — a most improbable story, but well proved. When he reaches the intestine he stays there, and gradually poisons the body. A good many people get so used to it that they do not have any symptoms and do not become anemic. They develop protective substances — anti-toxins — within their own system. But not everybody is so fortunate.

Q. Is hookworm found in the West Indies?

A. I have no doubt that it is common through all the West India islands, but I have no knowledge of it outside of the United States and its dependencies. It is common throughout Egypt and in a good many hot countries elsewhere.

CHAPTER XIV

INFECTIOUS DISEASES

I THINK it is important for laymen to know that, in the temperate zones of this part of the world, — that is, outside tropical climates, — *there are only three long, steady fevers.* By a long, steady fever I mean a fever that runs more than two weeks without touching normal. The importance of knowing that there are only three is, that, as a rule, if we can narrow it down to that, it is possible to rule out two and be sure that it is the third. The three long, steady fevers are typhoid, tuberculosis, and sepsis (generally due to streptococcus). If we hear of any one who has a long fever not called any one of those three things, we may be quite suspicious of the diagnosis.

Sepsis, as I have used it, is a wide term meaning blood poisoning from any form of suppuration, such as septic hand, foot, wounds of any sort, from appendicitis or deep abscess, as of the liver, or from inflammation in the heart itself which I have already described — *streptococcus endocarditis.* In relation to this and all other fevers I have already said that social workers and all other educated people should learn how to use a thermometer, how to read it, clean it, and shake it down. This is not a procedure which needs a long training or an expert; I think also, for the same reason,

social workers should learn to feel pulses, to know where the pulse is and be able to count it. Sometimes it is very reassuring to discover that a person whom we think very sick indeed has a pulse of 72 or thereabouts — a normal pulse.

For us all the most important thing about *typhoid fever* to-day is that it is gradually disappearing from the earth. Even within the twenty-four years that I have been practising medicine, I have seen a marked diminution in typhoid fever. Nowadays there is hardly enough to teach about; in my student days the difficulty was that the wards were full of typhoid. We know more about typhoid, how it is conveyed and how prevented, than almost any other disease, and it ought to be perfectly possible to wipe it out. The more civilized and carefully policed countries have wiped it out, and it is a pretty good index of the backwardness of any community if it has a high typhoid rate. Drinking-water and milk (we cannot have impure water and yet pure milk, since the containers in which milk is put are always washed with water, and germs therefore get into the milk) are usually the causes of typhoid.

In Philadelphia they cut the mortality of typhoid to about one third what it was, by doing nothing in the world but improving their water supply. In and about Boston the typhoid mortality has gone rapidly down since we have had the present water supply, one of the best, I think, in any community. Milk epidemics are commoner than water epidemics in recent years. A

milkman or some one of his employees gets typhoid, but does not know he has it, and continues to have the bacilli and pass them out in the urine and feces. Thence it is possible for the bacilli to get into the milk, and they do. Time and time again typhoid has been traced to an unsuspected *typhoid carrier* in the family of a milk-dealer. We use this word *carrier* to signify any person who is carrying around bacilli and can infect other people, though not himself suffering from the disease. In the same way we speak of *diphtheria carriers*. A great deal of stress has been laid upon the fly as a possible carrier of typhoid, and no one can possibly deny that flies sometimes do carry typhoid, but I think them a diminished and pretty nearly finished factor. "Swatting the fly" is excellent exercise, but has little to do with public health except in that way.

Typhoid fever runs a course of about four weeks. We have more definite diagnostic measures for it than for almost any other disease, and we should be sure of our diagnosis in practically every case. We can get the bacilli out of the patient's blood, or we can do other tests, especially the test called "the Widal," after the Frenchman who described it in 1896. It is possible to make this diagnosis without seeing the patient, and boards of health often do. The blood is sent by mail and tested in the state or city laboratory. In doubtful cases, then, in our contact with fevers, we should make sure that these tests are made. They are as important

as the Wassermann test in syphilis or the sputum examination in tuberculosis.

Nine people out of ten get well. The mortality is ten per cent — among children much smaller, as it is in almost all diseases which both children and adults have. We have no treatment for the disease, but nursing makes a big difference. We have no medicine that we rely upon at all, but in a long fever like this a good nurse can do much by feeding a patient who does not want to take food, by good care of his mouth, by bathing him skilfully and frequently, by encouraging him, and by keeping the bed in proper condition so that bedsores do not form. That may make a difference, I think, between life and death. I have often felt when attending difficult cases of typhoid that the right kind of a nurse had saved life.

It is one of the fevers that relapses, and after the regular four weeks it may go on and last two or three weeks more, or even longer. I have known it to last three or four months, with relapse after relapse and final recovery. We do not know the cause of relapses nor how to prevent them. We used to consider them due to indiscretions in diet, but nobody believes that to-day. The relapses are generally much milder than the original attack.

One of the curious things about typhoid is that people are sometimes healthier after an attack than before; people who were thin are especially apt to be stouter, not merely for the first few weeks, but for life.

Typhoid can be prevented by anti-typhoid vaccination. One of the greatest feats of all time I think in public health is the wiping-out of typhoid fever in the United States Army, where anti-typhoid vaccination is now compulsory. Every one who has occasion to travel where he knows nothing about the water supply, or who is in contact with typhoid patients, ought to take anti-typhoid vaccination. There is no danger and no considerable discomfort, and it is a very real protection. We had typhoid among the nurses in the Massachusetts General Hospital practically every year until we had them all vaccinated; since then there has been an extraordinary change for the better. Typhoid is caught in the nursing of patients by the nurse's getting the bacilli on to her hands and from the hands into the mouth and so into the blood and into the intestine.

Q. How long does vaccination immunity last?

A. That question cannot yet be precisely answered. Few doctors think that it lasts more than two years; perhaps not so long.

Diphtheria is a disease of childhood, and mostly of the children before school age. School nurses do a great deal to prevent diphtheria, but not in the schools. It is the school nurse's work in the home that checks diphtheria; she gets hold of it early and gets it treated. It is one of the most contagious of diseases, and with present treatment it carries a mortality of somewhere between two and six per cent, according to how early

the disease is treated. If diagnosis is made the first day, there is almost no mortality; but it is not often made before the third or fourth. Our most successful serum treatment is the serum treatment of diphtheria, and it is one of the eight or nine diseases which we can say we really cure. One of the most wonderful things that one can ever see in medicine is the clearing-up of a diphtheritic child's throat without a touch of local treatment, simply from the injection of diphtheritic serum. Early treatment is, as before said, the great thing, and early treatment cannot be had unless throat cultures are easily obtained and promptly examined. The throat is not very sore, often not as sore as in ordinary tonsillitis. It swells from the start, but unless one takes cultures of a great many suspected throats one would miss a great many cases of diphtheria. It takes about twelve hours — perhaps eight at the shortest — for the germs to develop in culture so that we can make a diagnosis from a throat culture. The process of taking a culture is simply to put a bit of sterile cotton upon a stick or a wire, rub it against the throat where it is suspected, and send that swab in a sterile test-tube to the laboratory for examination. The reason it takes time is that the bacilli have to grow upon a culture medium before there are enough of them to be recognized.

Q. Is diphtheria in the nose and ears just as serious?
A. I do not think there is any difference.

What we most fear in diphtheria is that it will get into the larynx around the vocal cords, because there it so easily chokes the child. If it gets down there we keep on with the serum treatment, but we also pass a metal tube through the larynx to keep it open. This is called "intubation," and needs a knack which comparatively few physicians have, yet it often saves life.

Within the last few years we have become aware of certain dangers in the anti-toxin treatment of diphtheria, which, while they do not concern many people, are serious to a few people. If a person is hypersensitive to the proteid secretions of a horse, — for instance, to a horse's breath, in other words, if he has any *horse asthma*, — the injection of immune horse serum, which is what we use as diphtheria anti-toxin, may produce very severe symptoms which are often fatal. The most terrible results are in people who have not got diphtheria, but are given serum in perfect health as a protective, and die of it. When I was at Johns Hopkins a few years ago they were having an epidemic in the hospital. The house physicians, nurses and orderlies had all been exposed, and were in a very considerable quandary as to whether they should receive a "protective" dose. Most of them chose not to, because they preferred to take their chance of being given the serum after they got the diphtheria (in case they got it), rather than take the chances of the anaphylaxis. Anaphylaxis is the result of hypersensitiveness to horse tissues. If a person of that type gets diphtheria, or is

exposed to it and takes anti-toxin, there is a big risk that the (horse) serum will produce serious, even fatal symptoms which we call "anaphylactic shock."

There is a test recently invented, the "Schick test," whereby we can tell who is naturally immune to diphtheria. A considerable portion of all humanity are naturally immune to diphtheria, and cannot get it. If we find that we are immune, we do not need to take anti-toxin or anything else, which is a great help in fighting the trouble.

Diphtheria sometimes leaves paralysis in the throat or in the leg; both are usually recovered from entirely; it is a temporary neuritis — infectious neuritis, either of the throat or of one of the legs — which carries a perfectly good prognosis.

Q. Are there any dangers in the Schick test?

A. None whatever; it is just like the Von Pirquet for tuberculosis.

Somewhere about three per cent of all children of school age carry diphtheria bacilli in their throats. But many of these children carry a bacillus which, although, as I have said, microscopically indistinguishable from the diphtheria bacillus, does not cause the disease in animals, "*is not pathogenic*" as the doctors say. We suppose that it is a weak imitation of the virulent diphtheria bacillus. At one time there was some hope that we might be able to check diphtheria epidemics by getting hold of all the "diphtheria carriers."

If, for example, at the end of the summer, we could round up all the school-children and shut up all the carriers when school began, theoretically there should be no diphtheria. Diphtheria slacks off very much when the children are not in school, and begins to flourish again progressively worse after they get together. That idea was tried out here in Boston in the Brighton Ward. I induced the Board of Health to get together all the Brighton children who were to be in school in a given year, to take cultures from their throats, and then to keep the carriers at home. They took the cultures and they kept some of the carriers at home, — not very many, — but the striking thing was that when diphtheria sprang up in the schools in its regular way, *it did not spring up in the families of the known carriers*. In other words, the disease did not spread, so far as we can see, through carriers. That ingenious procedure was based upon a false hope, and to-day we do not know any way of stopping diphtheria epidemics, except to isolate the children or the family in which the disease itself, not merely the carrier, is known to exist.

Scarlet fever, *measles*, and *chicken-pox* are generally classed together under the heading of "*the exanthemata*," meaning those which break out with a rash on the skin.

We do not know much about the organism of scarlet fever or of any of the exanthemata; we have been

searching for many years for these germs, but despite the recent discovery of Dr. F. B. Mallory we know little about them. This ignorance makes the diagnosis and the treatment of the exanthemata still wholly unsatisfactory. The diagnosis of scarlet fever is still based chiefly on the presence of a sore throat and a red rash. But there are many other things that give a red rash indistinguishable from the rash of scarlet fever. Consequently there are many wrong diagnoses, and always will be until we have some better way of recognizing the disease. At present, when a child has a sore throat and develops a red rash with fever, we *suspect* scarlet fever, but we often suspect it wrongly. Especially in young children there are a great many sudden red rashes, after tonsillectomy for example. In such cases scarlet fever is often suspected and nobody can positively say whether it is or is not present. I should not advise any layman to try to make this diagnosis. There are very few physicians who are in any way certain about it, and they are often wrong. The throat and the fever and the rash are about as much as we have to go on. The rash after a little while becomes a continuous red blush, not spotted like measles. In the early stages we can see bits of normal skin between the red marks, but as the disease goes on the rash fades at its edges into its neighboring portions, so that it makes a pretty continuous red blush. Quite often the diagnosis remains uncertain until the child begins to peel. I have often heard disputes between

physicians in which the closing argument was, "Well, I'll bet you he will peel." Peeling makes us about as certain of a diagnosis as we can be, but peeling comes when the active stages of the fever are past, and hence when diagnosis and isolation are not important.

There are two points of importance. First, that modern health physicians do not any longer disinfect houses, bedclothes, etc., after scarlet fever or after diphtheria, or after any of the germ diseases. That has been the theory and the belief of the Boston Board of Health for years, but it is only within a year that they have actually stopped disinfecting. I am not quite sure that they have stopped it after *all* the infectious diseases even now. The familiar process of burning formaldehyde, and making everything smell as badly as we can, has now been abandoned wherever science reigns — not everywhere because a good many boards of health are afraid of what people will say; but there is really no disagreement among competent physicians on this subject any more. Disinfecting is of no use. A good many health officers remain in the halfway stage, saying to the family, "You must make a very active use of soap and water after a case of infectious disease." But no physician, I think, supposes that this has anything to do with infection or prevents infection in future. It is always a good thing to clean house, and so if we can get people to clean house, we do. The belief at the present time is that by the time the germ has died out in the sick person, it has long before died

out in his surroundings. Hence his clothes or his books or his furniture do not give the disease to anybody else. We all of us remember most detailed, circumstantial evidence about cases in which the disease has been passed along by clothes or books, but these are not believed to-day. The evidence is all the other way.

The other important thing about the exanthemata, which is also rather hard to get people to believe, is that the most contagious time is the earliest period of the disease, and not the latest. We were all of us brought up to believe that the time people were peeling was the most dangerous of all times; but the present belief is that it is the least dangerous. The beginning of the disease, when there is a sore throat, is the time when contagion is the most likely to take place. Of course none of those questions can be settled in a way to satisfy everybody until we know more about the germ and can say that it is or is not in a given place.

We have no treatment of scarlet fever. The work of the physician is simply to see that isolation is carried out and that complications of the disease, such as kidney trouble or ear trouble or heart trouble, are treated. For the uncomplicated disease we have absolutely no treatment, and it is not at all likely that we shall have until we know more about the germ and can make some sort of serum or anti-body to combat it.

I just mentioned the three commonest complications, nephritis (Bright's disease), middle-ear trouble, and heart disease. If nephritis occurs, the physician

must see that the proper diet — milk diet in the early stages — is given. If the ear is affected he must see that proper treatment is given by a specialist, and if the heart is affected he must see that the child is kept quiet for a long time, as advised in other types of acute heart trouble.

Measles is a little easier to diagnose, less often mistaken for other things. There are many things that cause a red rash like scarlet fever. There are *not* many things that cause the spotted, pimply rash of measles, with running from the eyes and nose and a fever. That combination is generally recognizable by the trained layman as well as by the physician. The doctor can use no instruments of precision whatever here; he can just look at the patient and at the temperature chart, and make sure by cross-questioning that the patient has taken no bromide, iodide, or other drug that can produce such a rash. The most important thing about measles is that tuberculosis of the lungs often follows it, and that acute broncho-pneumonia sometimes complicates it and kills. We used to think that "children's diseases" were ailments that children had better have and get through with. That is not the prevailing belief at all to-day, because in the first place so many children die of them, and in the second place they may leave lifelong wounds upon the organs of the body. Measles predisposes to tuberculosis, presumably because it weakens the resistance of

the child at a time when he is very susceptible to infection of any kind, and because tuberculosis is one of the commonest kinds of infection that is always in the child's immediate vicinity. We have no reason to suppose that the germs of measles and tuberculosis have anything to do with each other, but we know that all children are tremendously susceptible to tuberculosis, and that almost every child in a large city has had it before he is ten. Hence in his weakness after measles he is more likely to catch tuberculosis than anything else that is going.

Chicken-pox, whose scientific name is *varicella*, is worth spending a word or two on in relation to terminology. There is the *smallpox* and the *large pox* and the *chicken-pox*. The original spelling was "pocks," a pock or many pocks. The "pock-marked" person had, of course, the right spelling. Smallpox is the disease which gives small marks; the large pox is syphilis, and is still referred to vulgarly as "the pox." Chicken-pox gives the smallest pocks of all, sometimes none at all; that is, the scars left after it are the smallest. *Varicella* is the mildest and the least important of all the children's diseases, practically never having any important complications or results. It sometimes looks very much like smallpox, and in times of an epidemic of smallpox very serious mistakes sometimes happen.

This diagnosis is a matter for experts. There are few men, even among trained physicians, who consider

themselves expert on the difference between smallpox and chicken-pox, because the average physician does not see enough smallpox. In general the distinction is that the person is not sick enough with chicken-pox; he is not prostrated; there is no evidence of being very ill. Then chicken-pox gets through its course very much quicker. I remember being called once to a children's institution in Boston where there were about two hundred children, and one of them had a disease which was either chicken-pox or smallpox; the child had already exposed a good many others. Should the children all be quarantined or sent home? The child had been sick four days; some of the "pocks" were already healing up, and that was really all the evidence that was needed. Smallpox is never healing in four days, so that this particular decision was easy to make.

As with scarlet fever, so with measles and chicken-pox, we have no treatment; we do nothing but protect the other members of the family from infection. Note that in all the diseases spoken of thus far I have taken pains to say when there is and is not a treatment. I think this is important when one tries to calculate what the cost of an illness ought to be. The cost of an illness in which there is no treatment ought to be considerably less than one which requires a physician and a nurse in constant attendance.

Whooping-cough, or pertussis, is the only one of this group whose cause we know. The bacillus of whooping-

cough is recognized, and that gives us some reasonable hope that some day we may have a cure; but so far we have not any. Whooping-cough is diagnosed by the nature of the cough, by the blood examination, and by the looks of the child during paroxysms. There is very little science in it. Any one who has seen a few cases can make the diagnosis. Once heard, the crowing inspiration which follows the series of coughs will be recognized very clearly whenever we hear it again. Among other things, the way the child coughs and coughs and coughs until he is blue in the face, and then often vomits and is relieved, are very characteristic.

Whooping-cough, like the other diseases just mentioned, — especially like measles, — leads to bronchopneumonia and to tuberculosis, and through these two leads to a great many deaths. That has only been realized, I think, of late years, and as yet there is no provision whatever in the city of Boston for the isolation of whooping-cough. Sooner or later it will have to be recognized as a disease from which the public needs protection as much as from some of those which are now isolated.

Whooping-cough has no fixed length or course as the exanthemata do. The worst of scarlet fever, measles, or chicken-pox is over in ten days; whooping-cough may run for months and has no ordinary or average period. Perhaps we can say that six weeks is somewhere near its average duration, but it may run for a much longer

period. Sometimes children won't get any better until they are taken to the seashore or the mountains.

Gonorrhea. The gonococcus, the organism of this disease, has certain favorite spots of infection in the body. We cannot say why it is that, after infecting the urethra, where it usually starts, it should jump, for instance, to the joints. Other favorite sites for gonorrhea, besides those that I have just mentioned, are the bladder, the Fallopian tubes, the epididymis and the prostate gland. To a certain extent it affects all the parts in the vicinity of those that I have mentioned —the vagina and uterus, sometimes the peritoneal cavity. It produces pus, acute inflammation, and after that scar tissue, with the result of closing various passages which ought to remain open; first of all the urethra, with resulting "stricture," which makes difficult the passage of urine and leads to all sorts of painful and disabling results. It closes the Fallopian tube in women, causing sterility, and the corresponding tube in the male, the tube leading from the testicle to the urethra, so that one or both sexes may be rendered sterile in this way.

The *gonorrheal vaginitis* of little girls has already been referred to (see page 196). The disease is extraordinarily stubborn and difficult to treat. Some say it is hopeless, but those who have worked hardest with it believe that they can stop it, or, at any rate, shorten its course; but they will add that it is hardly worth

while unless we can dig out the source of infection. Otherwise the child is perfectly sure to be reinfected. To find and check the source of infection involves getting on terms with the family which are delicate and difficult, but, for the tactful, not impossible. The present belief is that the return of the disease, which is seen in almost every case, is in fact a reinfection and not a relapse of the original infection. It seems to me a matter on which social workers especially need to be well informed. The treatment is a very time-consuming, bothersome process, and it is not in the least worth while to carry it out unless we are persuaded that we have found the source and can stop it, for otherwise the child's trouble is sure to recur.

This vulvo-vaginitis of little girls has been recognized for many years, and treated as of no importance. That it is gonorrheal has only been known for a very few years, and there are considerable portions of the country where it is not known yet. Because gonorrhea was always associated in people's minds with a sexual fault, and because it is perfectly sure that in little girls it may arise without any fault, its gonorrheal origin was not suspected at all until recent years.

Of *gonorrhea of the eyes* there is little to be said. A great deal of attention has been focused upon it of late years. Until very recent years very few believed that there was any possibility of managing gonorrhea *as a family problem*. No one thought it conceivable that when a married man with gonorrhea entered the hos-

pital anything could be done to protect the members of his family; or *vice versa*, to protect the husband of a married woman with gonorrhea. I feel sure that we are going to make progress in that problem as soon as social workers of the right type are installed in the clinics for venereal disease. We have assumed that the matter could not be talked out with members of a family, and that no one could possibly do anything toward preventing the spread of disease without driving patients to stay away from the clinic for fear of publicity. But although we have attempted in the Massachusetts General Hospital to attack this problem, certainly with *some* success, we have no evidence whatever that it has diminished the size of our gonorrhea clinic or kept anybody away. People are very much more ready to respond to an appeal against infecting others than they have been supposed to be. Those who practise genito-urinary surgery as a specialty now tell us that of late there is an increase in the number of young men who come to them for examination before marriage, fearing that they may not have been cured of a gonorrhea which they know well enough they have had years before. The train of events which leads to so many evils in marriage is this: The young man gets gonorrhea, thinks he is cured, thinks he is safe in marrying, marries; his gonorrhea wakes up again; he infects his wife. Knowing that train of events, an increasing number of young men, who have not force of character enough to avoid the original infection, but

have force of character enough to hate infecting any one else, now consult a specialist before marrying.

We have a test, parallel to the Wassermann test, a blood test for gonococcus infection. This is a very useful thing, supplementing other methods of discovering the presence or absence of gonorrhea. With a doubtful arthritis the blood test is often the deciding factor in our diagnosis, prognosis, and treatment.

The question is very often asked, and quite often answered, "How prevalent are gonococcus infections?" I have made some attempt to answer that among the patients who come to the Massachusetts General Hospital and are admitted to the wards.[1] Confining myself to men over sixteen, practically the only ages at which we have them in the medical wards of the Massachusetts General Hospital, I have read through a very large number of volumes of our records. Every single individual is asked the question, has he had gonorrhea or has he not. I believe the answers to this question are given truthfully, not because I think the patients are always truthful, but because I think under the particular conditions they do not lie. In the first place, they have no particular sense of shame in acknowledging a past gonorrhea to a doctor. In the second place, they are afraid not to do so, because they think it may make some difference to their present ill-

[1] "Observations regarding the Relative Frequency of the Different Diseases Prevalent in Boston and its Vicinity." Delivered at the Annual Meeting of the Massachusetts Medical Society, 1911.

ness in case they lie. As the result of that inquiry, in a very large number of cases, the figures show that thirty-three per cent of the class of men admitted to the hospital as ward patients were aware that they had had gonorrhea.

I believe those statistics are as reliable as any that we can get. Very much higher figures have often been quoted, but not usually upon any particular statistical evidence, usually from some one's impressions, or from army records, which is certainly not a fair test. There are no very differing conditions in races, the chief being that the Jewish people have apparently but one third as much gonorrhea as the rest. There is no considerable difference between Americans, Irish and Italians; all of them have about three times as much gonorrhea as the Jews. This investigation was made five years ago. The same is true of syphilis, or was at the time I made this investigation.

Syphilis is about one third as common as gonorrhea according to the confessions and knowledge of the same group of people just referred to. But this does not represent the facts, for, although I believe those were true answers, it is much more possible to have syphilis and not know it than to have gonorrhea unknowingly. It is perfectly well established that syphilis is often acquired without a person having the least idea of it, and shows itself in something like tabes or aneurism years after. But so far as the individual's knowledge is con-

cerned, it occurs in about ten per cent of the hospital population (males over sixteen) in this part of the country. About twenty-five per cent of hospital patients show a positive Wassermann reaction.

There is no need to go into any details about the germ of syphilis, the spirochæte. It has only been recognized of late years, but has helped us very much in the recognition and treatment of the disease.

We divide syphilis into congenital and acquired.

Congenital syphilis. Aside from Wassermann's reaction, most of the points which the physician relies upon in recognizing congenital syphilis are points which are perfectly obvious to the unaided eye. I think social workers ought to become familiar with them because the disease is so often overlooked and left untreated and because treatment is of value and should be instituted at once.

(1) First, as a rule, is the fact that the baby cannot easily nurse because his nose is filled up; it has *snuffles*, so that it cannot get its breath. Snuffles at a time when the baby is too young to have a cold in his head, snuffles in a newborn baby, is very suspicious. It is not proof, of course.

(2) Not long after that is noticed, an eruption appears upon the palms of the hands and soles of the feet. In adults this is not so characteristic, but there are very few things that give this eruption in a young baby except syphilis. One of the exceptions is the drying of the tissues that comes from diarrhea. A baby who has

had diarrhea may have its tissues so dried that there is scaling on the palms and soles as well as elsewhere. If we can exclude that, a *scaling eruption on the palms and soles*, or an eruption there without scaling, is almost characteristic of syphilis.

(3) The *corners of the mouth* are the third place that we look at. The baby gets a sore at the corners of the mouth, one or both, which in healing leaves little white scars as thick as the mark that you make with a pencil, and radiating from the corner of the mouth. Other diseases may produce the same thing; it is not in itself proof of syphilis; but it is enough to make us suspicious.

(4) Somewhat later come the changes in the eyes, of which the one easiest to recognize is the *keratitis*, whereby the bright front surface of the eye gets a steamy, slightly opaque look; the front of the eye is not perfectly bright and shiny as it should be. After we have seen this once or twice we recognize it very quickly.

(5) Then the *teeth;* here we have to repeat what I have said already, that nothing is absolutely characteristic. The only teeth that we are concerned with are the *upper front incisors*, the two teeth in the middle of the upper jaw. The change in the shape of the teeth has been already described and pictured. One of the mistakes that I have seen physicians make is to suspect syphilis in some one who has notched teeth. Half the people in the world have notched teeth.

(6) The *fingers* of young children with congenital syphilis often show swellings at a time when there is very little else except syphilis to produce such swellings of the last joint or the one before the last. The inflammation lasts for weeks, and is important, just because the children are so young and because tuberculosis is about the only other disease which produces such swellings in the fingers of the young child.

(7) Then the shins. The *sabre shin* is thickened and often curves forward; of course we must remember that rickets also gives a curved shin, but rickets does not *enlarge the shin bone at all;* syphilis does. If we have any other child at hand to use as a comparison, and can show that the shin bone is not only curved, but thicker than normal, we have important evidence of syphilis. X-ray of the shins adds conclusive evidence.

(8) The *ears* are less often affected, I think, than most of the other parts that I have mentioned, but a middle-ear trouble does come from syphilis in a young child, as well as the later syphilitic ear troubles which come about adolescence and are more common.

Probably until recently the vast majority of babies with congenital syphilis have died early, so that we do not know much about this form of syphilis in adults. But the outcome of congenital syphilis under modern treatment may be so soon changed that what has been said may not be true ten years hence. Even without treatment we occasionally see young adults who show evidence of having had syphilis from birth. But that

is rare. The number of cases past twenty that most physicians have seen is probably one or two in a lifetime. There is rather a characteristic look to the head in the few who do grow up to adolescence or adult life. We can generally distinguish them because the forehead is so big and the face so small, and as we look closely we can generally see some of the other points, at the corners of the mouth or in the teeth.

The disease may make a baby look like a little old man; one of the pathetic things in badly nourished children is that look of age, and syphilis is one of the diseases, but not the only one, that makes a child look so.

Acquired syphilis is generally divided into four groups of symptoms, though we recognize that they fade into each other on their edges: primary, secondary, tertiary, and the post-syphilitic lesions or parasyphilitic lesions (which are of the nervous system).

The primary lesion is called the *chancre*. Wherever the bacillus first takes root we get a sore which is slow, — lasts weeks, — is extraordinarily free from pain considering how angry it looks, and has a great deal more hardness or induration around its edge than most long-standing sores have. As one sees it, for instance, on the finger or on the lip in an innocent infection, one notices that the patient complains of much less pain than we should expect, and that when we take hold of the sore, it is tough and grisly around the edges. But the diagnosis here and everywhere in syphilis is made

certain only by microscopic examination and the Wassermann test.

There are two methods of microscopic examination, the examination of the stained smear, something like the specimens of sputa, and the examination by the dark-field microscope without stain. In the first case a little of the watery secretion of the sore is stained and put upon a piece of glass under the microscope, where the characteristic shape of the organism of syphilis, a very fine snaky cork-screw, is recognizable. With the dark-field microscope one uses no stain, but sees the motion of the live organism against the black field.

I think it is important for social workers to know all these facts, because they often are in the way of getting people to the point of being certain of a diagnosis, and I do not know of any diagnosis more important to be certain of, because of the danger to others and because of the long, expensive, but most valuable treatment. The Wassermann test is our other great method of diagnosis.

Somewhere in the neighborhood of six weeks after the first infection with syphilis (but with a good deal of time-variation in individual cases) come the "secondary" symptoms, which consist, in the first place, of a rash on the body, and in the mouth. More than that it is not safe to say. The variety of these rashes which can be seen is simply without end. Syphilis can imitate any kind of skin disease, and it is not worth while even to try to recognize it. No layman ought to attempt it.

The rash inside the mouth causes what are called *mucous patches* — white, as big as a finger nail, painless, looking a little like a canker sore, only bigger, whiter, and lasting far longer. The individual canker sore lasts only a few days, whereas the mucous patch of syphilis always lasts for weeks. Moreover, the mucous patch is painless, while the canker sore is always painful. Mucous patches may occur anywhere in the mouth, especially along the inside of the cheek; but anywhere else also.

At the time of this eruption the individual begins to feel sick; he has not felt sick heretofore. He begins to have a little fever and may have to give up his work, but many of them do not give up work, and it is those who are the most dangerous. Those who have moist eruptions upon the skin and in the mouth in this stage of syphilis are the most dangerous because it is the most contagious of all types of syphilis. With this eruption very often comes a sore throat, and a headache which may be worse at night, although that is not characteristic. There may be at the same time or later pains in the shins, a place where one does not often have pains. Near the time of the eruption the hair is very apt to fall out and the person may become temporarily bald. The glands in the neck and elsewhere also enlarge.

In the later stages of the disease not only the surface of the body but the internal organs are affected, the heart with syphilitic aortitis, described in one of

the earlier chapters. Syphilis also attacks the bronchial tubes, and sometimes closes one bronchial tube, so as to throw one lung out of business. Syphilis of the liver and spleen (usually the two come together) — are among the remaining important places in which syphilis strikes most frequently in the internal organs.

The later manifestations of syphilis ("tertiary") consist of sores called *gummata*, which may appear in any organ of the body. What has been said thus far refers to particular places like the skin, but gummata may come absolutely anywhere in the body. They have been seen in any organ we can name, heart, liver, brain, bones, skin, etc. There are, however, certain places where they appear most often, the frontal bone, about the elbows, and about the nose. It is at this stage that the trouble gets deep into the bones of the nose so that the nose falls in, giving what is called the "saddle-nose" of the person who has no bridge to his nose. That, however, like most of the things mentioned, can be due to causes other than syphilis.

I have already written at considerable length of *tabes and paresis*, the two commonest diseases by which syphilis strikes the nervous system. They come, as a rule, years after the primary infection, — from ten to thirty years, — and it is these patients who most often can perfectly truthfully say that they have no idea that they ever had syphilis. Only in recent years has it been recognized that there is a definite connection between paresis, tabes, and syphilis. But

there is now no disagreement among medical men that they are always due to this single cause.

There are other forms of syphilis in the nervous system, besides tabes and paresis. One of the most important is syphilis of the base of the brain where the nerves which go to the organs of sense, especially to the eye, come out. In a clinic for nervous diseases or a syphilis clinic, we are pretty sure to see a number of individuals with one eye drawn outward or with one eye closed. That is no proof of syphilis, but it is suggestive, and especially when, if we lift the dropped eyelid, we find the eye pulled outward. That means that the muscles of the eye, except the one that pulls the eye out, are paralyzed. The remaining unparalyzed muscle overacts, and pulls the eye outward. After tabes and paresis this is the commonest type of syphilis in the central nervous system.

Syphilis is very much commoner in men than it is in women. I do not think the fact has ever been altogether accounted for. All the diseases that are due to syphilis are very much commoner in men. In races who have not previously had the disease it has tremendous fatality; one of the most tragic effects of the contact of what we call civilization with a savage race is the spread of syphilis and the tremendous fatality of the disease so spread. Its spread to the negro and to the American Indian are examples of what I mean. There is no race that we see in these parts which has syphilis with anything like the frequency of the negro,

and it is generally believed, by those in a position to know, that this has come about mostly since the Civil War, as the tremendous commonness of tuberculosis in the negro also has. On the other hand, one of the inexplicable facts is that the negro almost never gets some of the results of syphilis, especially tabes. Physicians who practice in Southern States tell us that while tabes does occur in negroes, it is vastly rarer than it is in the white.

The question is often asked, "Can syphilis be cured?" I do not think anybody is in a position to give an absolute answer to the question. Syphilis certainly can be made to disappear, and to disappear for a considerable period of years, but in view of such facts as I have just quoted, — i.e., the occurrence of tabes twenty or thirty years after the original infection, — it is pretty hard to say positively that syphilis is ever cured. In the great majority of cases, when properly treated, — that is, energetically and persistently treated, — it can be made to disappear. We used to have absolutely no check whereby we could say that a patient had had treatment enough. The patients used to ask, "How long should I have treatment?" and no answer could be given them. As a rule we used to keep the patient under treatment as long as we could keep him — a year or two, and we had no good reason to suppose that he needed treatment longer. To-day we feel that when a patient has had a negative Wassermann reaction and no external or internal evidence of

syphilis for one year, we are ready to say that he may marry and that he does not just then need treatment, although we cannot say that he is cured.

The Wassermann test has about it a great deal that we do not know. We do not know for certain that a person with a persistently negative Wassermann reaction does not have syphilis. In a few cases we have positive evidence of syphilis on the surface of the body despite a negative Wassermann. Still the Wassermann is the best guide we have in the treatment of syphilis and the only guide until late years. We certainly can overtreat a patient; the drugs we give are poisonous and it is perfectly possible for a person to suffer as much from the treatment as from the disease. It is not best, therefore, to have a patient go on indefinitely with this treatment.

The treatment of syphilis now consists of two drugs which have been tried for a great many years, and one that has been tried for only a few years. When Ehrlich made his original studies with salvarsan in animals, he had great hopes that were reflected in the early hopes of physicians, but which have not been verified. He was able in animals to give a dose of salvarsan which would kill all the germs in the body, and he spoke at that time of a *therapia magna sterilans*, or a *great sterilizing cure*, which seemed to be possible in the early stages. He hoped that if we gave one great dose we could finish the disease. We have given up that hope now, and we have witnessed some slight reaction against salvarsan.

Now we are settling down to a more sensible opinion. I know only one prominent physician who does not use salvarsan; I know no physicians who do not use the older remedies, mercury, iodide of potash. Social workers hear more about salvarsan because of its expense and because they are often asked for financial aid for this. Salvarsan, as is perhaps generally known, is arsenic and nothing but arsenic, so combined as to be fatal to most of the germs of syphilis without being fatal to the cells of the body. The term 606, which is a synonym for salvarsan, means that this was the 606th combination of arsenic with other chemicals which Ehrlich made in his attempt to find, what he finally did hit, a substance which would kill most of the germs and not prove fatal to the patient. Neo-salvarsan — 914 — was his next discovery, because Ehrlich did not stop with 606. He wanted to find something better and cheaper. But it is worth while to recognize that in 606 we are dealing with arsenic, so that we give it for pernicious anemia and for diseases for which we used to use arsenic in other forms. "914" has not proved better than "606."

To-day there is practically only one method in which salvarsan is given. It is always put into a vein. Up to a couple of years ago there was a difference of opinion. We used to put it into the muscular tissues, but that is now discarded. It is a difficult drug to get rightly prepared. Few apothecaries are ready to make it so that it is harmless; there are a great many slips

possible which make the drug very poisonous. Few physicians are ready to give salvarsan in their offices unless they have the assistance of a perfectly reliable apothecary. Neo-salvarsan, on the other hand, is much less dangerous and much less difficult to mix up. Hence it is used in some doctors' offices where salvarsan is not. But neo-salvarsan is less effective against syphilis. Besides the difficulty of mixing salvarsan, we must avoid the difficulty of getting it into the tissues around the vein. It is also of some importance to put nothing else besides salvarsan into the vein, — no air, for instance, and no dirt.

I speak of all this because I think it should be generally known that to give 606 is a considerable process and that a physician must have considerable time and skill to do it successfully. To-day we give it in our outpatient clinics and let the patient go the same day after a little rest, but we prefer to have him at rest for twelve hours after the injection. The after-effects may vary from none at all to quite considerable. I cannot state what percentage of people have no after-effects, but certainly in a considerable number there are rashes, headaches, vomiting, pain, fever, or "collapse" which compels the person to give up for a day or two.

No one but a physician can prescribe salvarsan. I think a layman might easily become trained so that he would know more about giving it than the average physician, but certainly its use should be confined to those who have been trained in this particular process.

Of course the decision as to when it should be given should be made by a physician. We used to feel that the taking of blood for a Wassermann test was a pretty delicate matter, though now in the Massachusetts General Hospital it is being taken by physicians, nurses, students, and clinic secretaries, and so far I have heard of no bad results. But the giving of salvarsan certainly does not belong in that class.

Salvarsan is never given once only; it is generally given somewhere between five times and ten times, at intervals varying from five days to ten days or two weeks between the injections. The number of doses given depends upon the results — how the patient reacts, what happens to the Wassermann reaction. Between these spaced injections of salvarsan most physicians now give mercury at the same time.

The number of ways in which one can give mercury to a syphilitic is very great. Unlike salvarsan it can be given by the mouth, rubbed in through the skin, introduced subcutaneously, or into a vein. The majority of physicians prefer either to give it subcutaneously or to have it rubbed in through the skin. There are advantages and disadvantages in either way. If we give it subcutaneously, we are sure it is given; on the other hand, it is painful and the patient cannot do it himself. Still, I think the majority of physicians in hospitals now prefer that method, and use it more than any other, the reason being that they are then sure that it is given. Through the skin by inunction it is

given by taking a piece of mercury ointment about the size of a large pea and rubbing it for twenty minutes to half an hour on a portion of the skin until there is nothing to see. The patient can do that himself, but seldom can be trusted to do it well. He does it, on one side of the chest the first night, then on the other side; the third night on one side of the abdomen, then on the other side; then on one of his legs, then the other; and so on until he is round to the starting-point. This changing about is to avoid irritating the skin. The great disadvantage of this method is that it is dirty and gives up the advantages of secrecy. People using this method are pretty likely to get found out, but it has the advantage of being painless and possible for the patient to carry out himself with very little expense for the medicine; mercury ointment is not expensive.

Easier than either inunction or injection is the giving of mercury by the mouth, but it is the least effective method of the three. Doctors give it in that way when they cannot give it any other way. Of course with inunction we never know how much we are giving, the dose cannot be accurate; by the mouth or subcutaneously it can.

Every patient is warned to watch for symptoms of overdose. The first of these is a soreness of the teeth on striking them together; that comes twenty-four hours or so before the more serious result of inflammation of the mouth, *stomatitis*, with increased flow

of saliva, whence the term "salivation." Our grandfathers never thought they had given mercury enough unless they had salivated their patients. Nowadays patients do not take kindly to the idea and doctors try their best to avoid it. But this is often impossible unless the patient obeys the direction to stop treatment the instant there is any soreness of the teeth; even then he sometimes will have trouble afterwards.

Mercury and salvarsan are given for practically the same purpose, with this exception, that salvarsan acts far more quickly; hence in a very contagious patient, salvarsan is the drug to give as a public health measure. We call neo-salvarsan "emergency salvarsan" because we can keep it on hand. Salvarsan or neo-salvarsan is given in our syphilis clinic to every contagious case; we make sure of at least one dose in such cases. It will often dry up a moist lesion in twenty-four to forty-eight hours. Mercury acts much more slowly, but seems to help in certain ways that salvarsan does not help. The patient getting both is better off.

Potassium iodide is the least valuable and the least given of the three in modern clinics. Yet I can remember the days, within ten years, when medical men felt themselves right in giving iodide of potash and nothing else to a syphilitic. No one would do that to-day, yet it will dry up and heal up superficial lesions quicker than mercury, — though more slowly than salvarsan. It is to be given, therefore, in cases where we cannot get salvarsan, and want to get a quick effect on a dan-

gerous lesion. It does not cure syphilis at all. Mercury and salvarsan certainly cure to a certain extent, if not wholly. Potassic iodide is given by the mouth. It is not a difficult drug to take, and has no very serious results from overdose.

CHAPTER XV

INFECTIOUS DISEASES (CONTINUED)

MALARIA is one of the best understood of all infections. It is due to an animal, not a vegetable parasite (in ordinary infectious fevers the bacilli are vegetables according to the present classification). The cause of malaria is very different, an enormously larger organism; and, so far as we know, it does not live at all outside the bodies of animals including man. We know now that there is but one way in which human beings get it, and the negative side of that knowledge is just as important as the positive.

The word "malaria" is Italian; it means "bad air," and the old view, which still lingers in country districts, was that it was something in the night air that people breathed in. We can understand now quite easily how that was accepted, because night is the time that mosquitoes get in their work. We know today that the malarial organism is transmitted only by mosquitoes and by a few species of mosquitoes. There are several ways in which the chain of events whereby a person acquires malaria can be broken: (1) by destroying the species of mosquito that transmits it — we do not need to destroy all, only certain species; (2) by preventing ourselves from being bitten by a mosquito which has previously bitten a malarial patient;

and (3) by having no malaria patients for a mosquito to bite. All these ways are utilized, but the last is the most useful.

If we can once cure all the malarial patients in a given district, then it does not make any difference how many malaria mosquitoes we have, there is nobody from whose blood they can get the malarial parasite, and transmit it to us. In malarial districts the most important single precaution which a healthy individual can take is to take small doses of quinine all the time. In the Canal Zone, where, in spite of every effort, they cannot abolish all the mosquitoes or all the malarial patients, they have their employees, so far as they can control them, take small doses of quinine continually. The effect of this is that if one is bitten the germs are killed off before they get much of a hold.

Within my own lifetime as a medical man we have gone through three phases in Boston and vicinity in relation to the occurrence and frequency of malaria. In 1890 when I was a medical student there was no malaria at all in or near Boston, except what was brought in from the West Indies or from Southern parts. If a case was discovered here we said at once, "Where have you come from?" The second phase, which was at its height about ten years later, about 1900, coincided with the opening-up of a good many drains, and, what people did not perceive so clearly, the opening-up of those drains by Italian workmen, some of whom were presumably infected with malaria,

because it is enormously common in Italy. Malaria occurred especially in the houses near the drains, and that was explained on the miasma theory; but the fact that the malaria mosquito never flies many yards explains it much better. First, the Italians were bitten by the mosquitoes and then the people near by. Right round the Massachusetts General Hospital there was a good deal of malaria in 1900. Now we find it hard to establish the presence of any cases of malaria there. It has died out again very fast. There still is malaria in the suburbs of Boston and along the Charles River, but far less than there used to be, so that one requires far more evidence for proof now.

The diagnosis of malaria should never be in doubt. It is one of the few diseases which is easy to recognize, because we have an absolute criterion, the presence of the parasite in the blood. A person whose blood does not contain the malarial parasite has no malaria. It is true that it needs a little practice to recognize this parasite, but not much, and there is no excuse for any wrong diagnosis. A great many wrong diagnoses are made, simply because the blood is not examined. One of our first duties, therefore, is to find out whether the blood of any person suspected of having malaria has been examined. If it has not been examined, there is no certainty of the diagnosis, and if it has been examined, there ought to be no doubt.

There are three forms of malaria. In the southern part of this country, and in the tropics, all three exist.

In New England and the northern half of the United States generally, we have only one type — the *tertian* type, which is so called because the fever comes every third day, provided you count both ends. It comes every other day. It is possible to have two generations of malarial organisms living in our blood at the same time; the first lives forty-eight hours, born the first day, lives until the third, and then starts again. Another generation starts on the second and lives until the fourth, and so we have two sets and a chill every day, one set on the first, third, and fifth day, the other on the second, fourth, and sixth.

Pretty much everybody, I suppose, knows the familiar group of symptoms, chill, fever, and sweat. The temperature which has been normal up to a few hours before, suddenly rises within a few hours, say to 104° or thereabouts, and during that stage the patient feels very cold; then he feels very hot, his temperature goes down, and he perspires freely. He will shake during the chill, and has a good many other symptoms, such as vomiting, blueness of the hands, and headache. The essential facts are given us by the thermometer, and by the fact that next day he is all right. A person very sick one day, all right the next, very sick the third, and all right the fourth, can practically only have one disease; but still the only proof is the examination of the blood.

Tertian malaria is one of the easiest of all diseases to cure. There is no excuse for not curing a case of it, and

a case which is said to resist treatment or to be uncured by quinine is not malaria. It may be of interest to inquire, "Then, what is it?" Curiously enough, it is often advanced phthisis. I have again and again been called to examine the blood in supposed malaria, and have found advanced tuberculosis, undiscovered before because the chest had not been examined. Or the true diagnosis may be a deep abscess somewhere in the body, which causes irregular chills, somewhat but not much like those of malaria — irregular, not every third day.

The other type of malaria often seen in the southern part of this country, practically never seen here, is called the *estivo-autumnal*. That is a very much more serious disease, and is the cause in tropical countries of a great many deaths, as it was in the digging of our own Panama Canal. It causes fever which has no fixed type like the tertian, but may run continuously for two or three weeks without ever dropping to normal at all, or may drop every four or five days and then go up again. There is no fixed type. The diagnosis, therefore, depends wholly upon the examination of the blood for parasites. Now and then we have made bad mistakes in cases that were brought to the Massachusetts General Hospital. We were not looking for this fever which never occurs here, failed to examine the blood carefully, and treated the cases for something else, especially for typhoid.

This type of malaria does not yield always to qui-

nine, and there are cases which die in spite of quinine, because the parasites accumulate in the brain and cause brain symptoms which are fatal.

A few words on the characteristics of the mosquito that means business in respect to malaria as contrasted with the harmless forms of mosquito. If we kill any ordinary mosquito and look at him carefully, we find, nine times out of ten, that we have killed a perfectly harmless animal so far as malaria is concerned — one of the kind called *culex*. There are three characteristic points about the culex: (1) when he stands he stands on all fours, all sixes rather, with all his legs down; (2) he has stripes on his legs like a Princeton man; (3) he has wings that are *not* spotted. This is the harmless *culex* in contrast with the dangerous *anopheles*. When *he* stands (1) he stands on four legs and kicks up behind the other two legs; (2) his legs have no stripes; and (3) his wings *are* spotted. In the culex the wing is simply a stripeless web; in the anopheles we can see spots with the naked eye, but more clearly with a glass.

To kill off mosquitoes is part of public health, and so near to every one's interests. The essential thing is to prevent their breeding. Killing the ones that we see is some satisfaction to us, but does no good. To have any effect on numbers we must stop their breeding. They always breed in stagnant water, and in fresh water, not in salt. In a stream or in a lake that has stagnant pools around its edge, they will breed. They cannot breed unless they can come to the surface of

the water, and they cannot do this if the surface of the water is coated with kerosene. So we pour kerosene on all the pools of water that we cannot dry up — in the cans outside the woodshed as well as in the more obvious pools. We cover with kerosene every body of stagnant water out of doors.

Every patient with malaria should be screened so that the mosquitoes cannot bite him, not only for his own sake, but still more for the sake of the rest of us who may get some of his germs transmitted by mosquitoes.

Q. Does every one bitten have the disease?

A. No; certainly not. A person may have the parasites in the blood and not suffer from the disease. There are certain villages in Central Africa in which physicians have found almost every single child infected, and yet most of them perfectly healthy and free from symptoms. Parasites are in their blood but harmless to them, so that we could not say that these children have the disease. These malaria carriers — infected but healthy — are dangerous to others. Mosquitoes bite the carrier and transfer parasites to others not immune. In them the symptoms of disease may be seen.

In the blood the organism attacks the red corpuscles and eats them up; having eaten one it migrates to another. Each generation is born and dies in forty-eight hours. When a generation is born, fifteen to twenty-five at a time from each parent cell, that is the chill, because we are suddenly attacked by fifteen to twenty-five times as many as there were before, — that is, in the tertian type.

Quinine is a specific; that is, it will cure every case of the tertian type, and practically every case of the estivo-autumnal type if it is taken in time. We can watch the action of the quinine in the blood by giving it to a person who has malaria, and seeing the germs under the microscope shrivel up and die as they meet the circulating quinine. It is perhaps worth while to say that quinine is a purely chance discovery, the extract of the inner bark of a tree which happens to have been found by monks centuries ago, not searching on any rational principle, but as nearly by chance as anything we know.

Q. How far North does the more dangerous type come?
A. About to Mason and Dixon's line. There is plenty of dangerous malaria in Baltimore, but practically none in New York.

Malaria is one of the diseases that ought to be entirely exterminated. It is easier and cheaper to exterminate than any other disease that we know, by the recognition and treatment of all patients, and by the draining of all pools and ponds in the neighborhoods known to be especially inhabited by the anopheles mosquito.

Septicemia, or *sepsis*, is blood poisoning. *Septic* and *emia* — both familiar roots to us; *septic* means poisoned; the *emia* root means blood; and it is a literal and proper account of what the disease is — blood poison-

ing by germs, not by any other poisons, and not by any or all germs, but by the germs which produce pus, chiefly by streptococci which grow in chains, or by staphylococci which grow in bunches. Those organisms are with us all the time. I do not suppose there is a person living who has not got them in the mouth and in the skin. We have them even when we wash our hands carefully; we wash off only the gross dirt and germs. Absolute cleanliness of the skin is an impossibility, because these germs are *in* the skin as well as *on* it. The staphylococcus cannot be got out in any way whatever. The streptococcus is in the mouth and cannot be got out. There is no use in trying to avoid these germs, but they are ordinarily harmless because they do not penetrate into the blood. Once they are free in the blood we have a very serious disease, septicemia. The ordinary cut or wound of the hand or of any surface of the body contains these germs; that is why there is suppuration in it, pus in it. Ordinarily they do not penetrate farther. But at any time we may hear that the wound has "gone septic," or that the patient has a "septic hand" or foot or neck. This means that the cocci have broken through into the interior of the body and into the blood stream.

Sepsis is of all degrees of severity. Probably most persons who have any fever at all, in connection with a wound or operation, have septicemia of a mild type. But ordinarily the body very soon kills off these germs in the blood, and nothing serious results. If they be-

come accustomed to living in the blood, — if, that is, the blood loses its power to kill them off, so that they stay and multiply there, — we have the dangerous form of septicemia.

Wound sepsis is the commonest type, and is common in proportion to the difficulty of cleaning out a wound. Many of us have heard of the tremendous proportion of sepsis in the wounds now seen in France, because septic material, such as fragments of clothing, are carried into the wound and cannot soon be cleaned out. That means sepsis and a high death-rate.

Next comes operative sepsis. Every surgeon fears and fights sepsis. He does all he can to sterilize his hands, his gloves, his dressings, his instruments, his ligatures, and the patient's skin. But despite all precautions wounds occasionally "go septic." The number of cases in which this happens is diminishing every year, and it is more and more thought that some slip in the technique of asepsis is made in the case, or the wound would not be septic. In the older fiction most of us must have noticed references to a "healthy suppuration" in wounds and after operations. We have no "healthy suppuration" nowadays if a wound is kept properly clean.

Puerperal sepsis is the poisoning of the blood stream through the wounded surface of the uterus after childbirth. Many cases occur also after abortions, because septic material is put into the uterus in the attempt to bring about the abortion. (See page 184.)

Septicemia also comes about in connection with diseases of the heart, when bacteria are colonized upon the heart valves and spread thence by the blood stream to all parts of the body. In those cases we do not always know how the germ gets in. Perhaps sometimes it enters by the tonsils, and thence spreads, through the blood stream, to the heart. The fever which is so common in the heart troubles of children is a sepsis similar to the puerperal or operative types.

In deep abscesses which cannot be drained, or have not been drained, septicemia develops. An example of that is the deep abscess in the lungs of the tuberculous patient. The tuberculous patient suffers only in part from the tubercle bacilli. The lung cavities are invaded by the staphylococcus and streptococcus on top of the tubercle bacilli, and most of the severe symptoms, the night-sweats, fever and emaciation of tuberculous persons are due to septicemia. We cannot drain those cavities surgically; the patient drains them partially by coughing, but cannot drain them thoroughly. Hence in the advanced stages of tuberculosis we are dealing really with sepsis in the lung.

Bacilli from the intestine get into the gall-bladder and biliary ducts, and set up their suppurations in the gall-bladder, and from there sometimes in the liver. It may be impossible to drain them, because there may be so many abscesses in the liver that we cannot drain them all, and a fatal septicemia comes about in that way. There are deep abscesses of the kidney and of the

prostate gland, the result of which if not properly drained is sepsis.

In all these cases the symptoms are a good deal like malaria, but not so regular. There are chills, fever, sweats, but on no precise plan. Two or three chills may occur in one day and then none for a day or two. The type of fever we expect is what is called a "picket-fence" temperature, because of the looks of the chart. The temperature oscillates rapidly from high to low, not steadily persisting day and night as in typhoid. "A septic chart," the nurse shows us. The patient does not necessarily feel very sick. He sometimes does not feel sick at all, though he is a little weak. He often has a good appetite, and generally no pain, but that is about the only good thing you can say about the disease. His strength gradually ebbs away.

The prognosis depends on the possibility of surgical drainage and on the patient's own individual vital resistance. We have no medicinal treatment whatsoever. If the sepsis is due to a wound, we can drain that wound, and if to an abscess, we can open that abscess, and the patient may get well. But if those conditions are not present, the patient will probably die, although at any time the person's own resistance may assert itself.

I have sufficiently described septicemia in the narrower sense, as we ordinarily use the word, due to streptococci or to staphylococci, or to both at once. We also use "sepsis" in the broader sense to mean the

invasion of the blood stream by *any* baccillus. For instance, the pneumococcus gets through into the blood stream very often; probably most cases of pneumonia have a septicemia. So with typhoid, with anthrax, and with tetanus. We *could* speak of these diseases as septicemia, but as a rule we do not.

Erysipelas ("St. Anthony's Fire") is due to the streptococcus, the same organism that I have mentioned frequently in connection with heart disease, kidney disease, tonsillitis, and septicemia. In erysipelas, for reasons that we do not understand, this streptococcus runs along, like a prairie fire, just underneath the skin and produces a shallow inflammation with absorption of poisons and general streptococcus septicemia, more or less serious. After one has seen a few cases, one can recognize it simply by the appearance of the skin. The trouble starts usually on the side of the nose or near the eye, somewhere about the central part of the face. It starts as a small patch, very bright red and slightly raised above the surface. Then that gradually spreads in all directions until it may cover the whole face and neck, but rarely goes farther. The skin is swollen so that the eyes are closed, and the whole face puffy. At the end of the disease there is peeling, as in a person who has been very much sunburned. The local inflammation is not of any great importance; the serious part of it is when the streptococcus gets loose in the blood stream to some extent, usually to a very

slight extent. In the great majority of cases, if the person is in good health at the outset, he gets well. The disease is serious only if it attacks people who are greatly weakened by some previous trouble. Old people with weak hearts, kidney trouble, or diabetes die of this disease with what we call a "terminal infection." We are afraid of erysipelas, therefore, in old people; we are not afraid of it in others. As a rule it is perfectly harmless in middle-aged or young people who have no previous disease, though occasionally it leaves slight scars on the skin.

It has no definite course; it may last a few days, may last two or three weeks, but it stops of itself when it gets ready. Every sort of medicine has been painted on the skin; I have seen at least a dozen remedies tried out, but none of them had the slightest effect. Some day we shall probably get an anti-erysipelas serum like the anti-diphtheritic serum, but we have nothing of value yet. Nothing painted on the skin will ever have any effect because the disease is too deep-seated.

Q. Does it occur only on the face?

A. No; that is the commonest site, but it may occur in other places, on the leg or around the edge of a wound. Some people have it again and again. I had a choreman who had three or four attacks and never once went to bed with it. With him it started on one ear, and that is a fairly common starting-place.

Tetanus ("lock-jaw") is due to a bacillus which is very common in all sorts of places, especially in gar-

den soil, but ordinarily quite harmless because it will not grow unless it is deprived of oxygen. It won't grow on the surface of the body, or in any open wound, does not multiply at all on the soil on the surface of the earth; but only when it is deprived of oxygen; as, for example, when it is driven deep into a wound in the body. That is why we are afraid of deep, penetrating wounds which cannot be probed open. That is why early in the Great War there was such a tremendous amount of tetanus. We associate it with wounds in which some one has stepped upon a needle or a nail, and driven it deep into the foot, but it is the same in every part of the body.

The disease itself is sufficiently described by the familiar term "lock-jaw," which is a spasm of the muscles with which we bite, a spasm of the chewing muscles, so that the jaws become fixed. The cramp is not confined to those muscles and this cramp in itself is not, of course, very serious. We can feed patients through the nose, or pull out their teeth. But the serious thing is the spread of the bacilli or their poisons beyond the point of entrance. This results in convulsions, exhaustion, and death.

Two things we can do to cure or to avoid tetanus: in the first place, to be sure that any deeply penetrating wound is widely opened so that the air can get in. One sees now and then a child who has stepped on a nail, with a resulting little scratch that does not bleed at all. But if we know that the nail has gone in a half-inch or

more, we cannot do a more important thing than to get that child to a surgeon and get that puncture widely opened. Once that is done there is no more danger. Unless it is done there is always danger. We should follow up every deeply penetrating wound and see that it is properly opened by a surgeon.

The second thing is to give the anti-tetanus serum, discovered at the same time that the anti-diphtheritic serum was discovered. It won't often cure cases after the trouble has got started, but it will prevent the development of the bacilli if it is given as soon as the wound occurs. A great deal of good has been done in the European War by giving anti-tetanus serum before tetanus occurs to people whose wounds are of such a nature that we know they cannot be thoroughly cleaned out. If a cut bleeds freely, it is not likely to have tetanus; the blood is likely to carry the germs out with it.

We have all heard of the great number of cases of tetanus occurring on the sixth or seventh of July; that is, about three days after the Fourth of July. The germs are carried in by a toy pistol wad ordinarily. In this country the vast majority of tetanus cases are due to the Fourth of July wounds, but since the agitation against this form of celebration there has been a decrease in the amount of tetanus. More than half the cases die.

Questions and Answers

Q. Would you advise a person who had such a wound and could not get to a surgeon, to open it himself?

A. Yes.

Q. Would you advise every case of a person who ran a needle into a foot or finger to have it opened?

A. I should.

Q. Even if the needle does not stay in?

A. Yes; the germ stays in even if the needle comes out.

Anthrax. We have had nearly a dozen cases of anthrax in the Massachusetts General Hospital within a year, which is more than we have had in twenty years before that. It has a very definite relation to occupation, so it seems to me that all social workers ought to know something about it. It is a disease common in sheep and cattle, and rare in human beings. In Europe especially it has at times killed a quarter of all the sheep or cattle. In accordance with that fact, it comes chiefly in those human beings who deal with *hides and wool.* It used to be called "wool-sorter's disease"; but in this country it comes especially from hides of other sorts. Most of the cases we have seen this year have come in men who handle or carry hides. There are anthrax germs in the hide and they get into some crack or scratch on the hands or more often in the neck.

It is a frequently fatal disease. Starting with what looks like an ordinary boil, a pustule, the germ gets loose, multiplies in the blood, and often causes death. We should always follow up particularly any boil or

sore in those whom we know to be engaged in jobs that involve the handling of hides either of sheep or of cattle, and in those who handle wool. The germ also causes a pneumonia when it gets into the lungs, and is almost invariably fatal when it does.

From a practical point of view, all we need to bear in mind is that people who handle hides ought to be especially careful of their skin, their hands and faces and necks, where they come in possible contact with hides. Surgeons formerly did very radical operations on cases of anthrax. Now there is a growing tendency to let them alone, because surgical interference may spread instead of checking the infection. Good nursing is the main point.

Questions and Answers

Q. Does the skin have to be broken?

A. I do not believe we can positively answer that. The chances are that the same thing is true here as is true of other infections, that those minute normal openings of the skin called the "hair follicles" are sufficient; those openings are microscopic, but large enough for organisms to get in. I do not think we can say that it does not occur that way with anthrax. It does not affect any other person unless by a transference of pus. It is perfectly possible to spread it from human being to human being through the pus.

Q. Does it come through animals that had anthrax?

A. Yes. Anthrax is a common disease in sheep and cattle. There is no particular danger from eating the meat of these animals, because cooking and the gastric juices are our defense.

Leprosy is a disease which it is almost impossible to catch, but unfortunately the public has very much the opposite idea, so that the leper has been, I think, disgracefully, very expensively, very stupidly treated, by extreme isolation upon such islands as Penikese and Molokai. This isolation is because of superstitions on the part of the public that a leper, who almost never gives anybody disease, should be shut up tight, while syphilitics and the tuberculous go free. This is one of the paradoxes and abominations of our system. The Massachusetts State Board of Health has again and again pointed out to our State Government that it is very unnecessary to keep a few poor lepers, who certainly ought to be kept on the mainland, isolated for life on a desolate island. But a very unintelligent and very stubborn prejudice still persuades people that leprosy is a highly contagious disease. It is not impossible to catch it, but it is one of the least contagious of all the diseases, and we are all exposed every day to more contagious ones.

We see two or three cases a year in the Massachusetts General Hospital. In the Orient, it is very common, and in the Hawaiian Islands, so that one island there, Molokai, is set aside for the isolation of the cases. It is a very slow-going disease, lasting twenty or thirty years, and patients practically never die of it. They die of the exhaustion which makes them the prey of some intercurrent infection.

It attacks the face, hands, and feet with a slow-

going, destructive ulceration. Features, fingers, and toes may finally be destroyed by it. In the early stages, when it is most important to recognize it, the inexpert would not notice it at all except that these patients may seem to have more wrinkles on the face than others; the face deeply furrowed. We see it here more often in negroes than in any other race.

I think the disease is most interesting from the public health point of view, for here we have given to the State Board of Health the power to put a person out of the community for life because of a disease which, as I have said, is of almost no danger to the general public. But still we think that such powers ought to be held by the State Board of Health, although not applied to this rather innocent disease. It is sometimes questioned whether the State has any right to deal in this way with individuals, by reason of their infection with syphilis, tuberculosis, or typhoid, but it may be pointed out that we are already doing it in the case of one feebly contagious disease, leprosy.

Ordinarily a leprous case is passed upon by a council of experts; no one man is ordinarily thought sufficient to make such a tremendous judgment. In Hawaii a board of experts passes upon the lesions and examines them microscopically as well as in gross. If that board is certain, there is no appeal from it.

Within the last two or three years our hopes have been aroused by work done in the Philippine Islands by United States public health officers on the cure of

leprosy. I do not think anybody can say that we have yet found a cure for leprosy, but certainly our control of the disease has been enormously improved during the past year by treatment with chaulmoogra oil as worked out in the Philippine Islands. Chaulmoogra oil is an herbal remedy used popularly for a long time, but not in any effective way until of late.

Smallpox, which used to be spelled "pocks," as I have said before, is one of the best examples of a disease which we have now conquered. Along with plague and yellow fever it makes a respectable trio of diseases which there is no reason to suppose we shall ever have again in civilized communities on a large scale. Yet in a city like Boston we are always in danger from the anti-vaccination cranks, who labor annually in the Legislature to repeal the law for the compulsory vaccination of school-children.

Smallpox is for children one of the most contagious of all known diseases; for adults it is also very contagious. We had a small experience of it in Boston a few years ago, and a number of investigators went to the hospital where the patients were and lived there (after vaccinating themselves), studying the disease at close quarters. None of them had the disease, but each of them had at least one pock, one lesion. The disease ordinarily causes the patient to be covered with a mass of suppurative boils, and on account of their vaccination these investigators, though they were in constant

contact with the disease, got only a single pimple. They did not stop work and were in no danger, but they left their investigation with a very hearty respect for the contagious powers of the disease. We have not seen a case for two years in the Massachusetts General Hospital. But in cities along the Canadian border, in cities with a large French-Canadian population and no compulsory vaccination, there are frequent small epidemics. In Kentucky and Tennessee and other Southern States also, there are many cases every year, because they have no compulsory vaccination there.

The two diseases that smallpox looks like are *acne* and *chicken-pox;* acne means the ordinary pimples on the face. The chief difference is that the smallpox patient is generally much sicker. Acne and chicken-pox do not make one feel sick. But the patient with smallpox is generally febrile and weak and in considerable pain in his head and back.

Certain things ought to be said about vaccination, because questions are often raised as to the dangers of the process, and as to the degree of protection which it gives. In the first place, the reason that the anti-vaccinationists' propaganda gets so much power is that people are afraid of having some disease put into their blood. I suppose the disease that they are afraid of is syphilis. I do not know of any well-authenticated case where a person has had a syphilitic lesion on the site of a vaccination, but one cannot deny the possibility of such a lesion provided vaccination were done

with criminal carelessness. The other thing that bothers people is the fact that vaccination sores get septic, sometimes when the vaccination is clumsily done, and sometimes when it is correctly done. We need not necessarily blame the doctor because the patient has a bad arm. In spite of all precautions, if the patient is in bad condition, any break in the skin may become septic.

Christian Scientists, especially, I think, feel strongly on the subject, and the question of their right to live according to their beliefs has often come up in terms of freedom — the kind of freedom that our ancestors came to America to win. It seems to me that the essential point is this: People are perfectly free to go unvaccinated and live their own lives, so long as they will live by themselves, and not endanger the rest of us. A man has a perfect right not to be vaccinated or allow his children to be vaccinated, provided he does not send his children to the public schools or allow them to mix with others. But he has no right to inflict his beliefs on the huge majority of people who disagree with him. That is the stand that Massachusetts has taken so far, but as I have said, each year we are afraid that the cranks will win out at the State House and that the vaccination law will be weakened.

The usual form of attack on the compulsory vaccination law is the proposal to allow parents their own free choice as to whether their children shall or shall not be vaccinated. That proposal is not justifiable I think,

because it endangers the majority. There never was a case where scientific evidence is clearer than in regard to vaccination. We have no reason to be moderate or modest at all in the matter. The evidence will convince any fair-minded person who examines it.

Thorough governmental inspection of the plants where vaccines are made, is our clear right, I think. I do not think that the possible dangers of sepsis from unclean vaccine points should be overlooked, nor do I think that anybody and everybody should be allowed to manufacture and to sell vaccine. There has also been a good deal of question about state manufacture of vaccine points and of free state vaccination. Certainly the fees charged for vaccination have sometimes been excessive. If there is any question about people's ability to pay, vaccination ought to be done free at the hospitals or elsewhere by the State or by the city.

Questions and Answers

Q. Are French-Canadians or negroes more likely to take smallpox?

A. It is only because they do not get vaccinated. We do not know any reason to suppose that they are any more prone than others to take it.

Q. Is there any reason why a child with syphilis should not be vaccinated?

A. No; I know of no good reason.

Q. How long does protection last?

A. The only safe way is to repeat vaccination whenever there is an epidemic. We do not ordinarily now vaccinate

people more than once unless in the presence of an epidemic. Then we have got to vaccinate everybody who is anywhere near the particular case. If a person has been vaccinated and it does not "take," he should be vaccinated at least three times more in the attempt to get it to "take."

Q. Is seven years the limit of immunity?

A. I do not think there is any good reason to believe that. The number seven still plays the part of a magic number in certain quarters, but I do not think there is any evidence back of it. Health boards do not usually advise adults to be vaccinated unless there is an epidemic in sight.

CHAPTER XVI

POISONS

LEAD-POISONING is vastly the most important industrial disease. I think it can be said to be the only *common* industrial disease whose existence we know to-day, though there are others which we suspect. We are always looking for evidence of poisoning in certain trades concerned with lead, — especially in workmen who manufacture or use paint.

There is a great difference between different kinds of painting work. All painters recognize this and speak of "inside jobs" and "outside jobs" as very different in their risks. The outdoor jobs, where there is free circulation of air, are very much less dangerous. Lead goes into the body in part through the intestinal tract (through the mouth) and by respiration. Sand-papering-off of paint containing lead is one of the most dangerous jobs; the lead dust gets into the air and is breathed in. Besides painters, a great many workers in iron get lead-poisoning because the iron which they handle is so often covered with lead paint, — pig iron may be covered with paint, — and if handled much has the dangers of handling lead. When people set type by hand, which they still do to some extent, they are in danger. We used to think of printing as the most dangerous occupation next to painting. To-day most type-

setting is done by the monotype or linotype, and that is not so dangerous as the older way.

In this part of the world certainly, next to painters the greatest danger is among rubber-workers. I suppose some of my readers may be as innocent as I recently was in thinking that if we are dealing with rubber we are dealing with rubber itself. But, in fact, pure rubber is almost never used. Even the workmen have sometimes no idea of what is mixed with the rubber, and are perfectly unconscious that they are dealing with lead. Litharge, which they mix with the rubber, is a lead compound. Of course not everybody who is concerned with rubber deals with lead, but in the mixing processes they do. There are other hazards in the rubber industry, but so far as lead is concerned it is chiefly in that one mixing process.

Next, perhaps the most common source of lead-poisoning is drinking-water. Not many years ago a change took place in the water supply to the town of Milton, Massachusetts, whereby that water attacked the lead in the pipes, and produced a large number of cases of lead-poisoning in the town. Some of these patients sued the city. That was the most extensive outbreak of lead-poisoning that I have ever known. Now and then one sees it away up in the country where people have not any idea that there is any possibility of their getting lead. On one occasion, that has always stuck in my memory, I found a whole family poisoned by lead, and after hunting around, found the weight of

the pendulum of an old clock which had been thrown down the well. I found it in a condition showing that a good deal of lead had come off it since it first fell there.

The symptoms of lead-poisoning are often masked for a long time. They do not show themselves in obvious ways until the case is well advanced. The earliest change that we can recognize easily is in the blood. With the dyes ordinarily used to stain blood, we get a new picture in the blood of a case of lead poisoning. The smooth, yellow face of the red corpuscle becomes "stippled," as if a charge of shot had been fired into it. In most medical institutions that is now called "stippling," the term often used by engravers being here applied to the looks of an affected red corpuscle. That symptom, of course, would not come to light unless some one suspected lead-poisoning, for stippling is not an easy thing to find in the blood. After the blood, the gums are the place that shows lead next. Lead circulates in the form of a soluble salt. In the gums it meets the products of food decomposition and is precipitated right in the gum itself, making a black or gray line along the edge of the gum where it touches the teeth. If a man has no teeth he has no lead-line, no matter how much poisoning he has. It may occur only on the inner surface of the teeth, so that a person who does not look for it very carefully with the mirror won't find it.

Next comes colic, intestinal pain, not differing in any way from the many stomach-aches to which the popu-

lation is subject, only significant in a person exposed to lead and not accustomed to having such attacks. They are accompanied by constipation. Next comes anemia, the destruction of red corpuscles by the poison. Only after all of this comes the thing that we hear most about, the "wrist-drop," or paralysis of the muscles of the wrist. I have not seen that now for quite a long time. A case never ought to get to the stage of wrist-drop. It ought to be recognized and cured before. Nevertheless a slight weakness of the forearm muscles demonstrable by careful tests may be a very early symptom.

Finally, rarest and most disgraceful to the medical profession, are the kidney effects and brain effects. The effects of lead upon the brain may give an illness like meningitis, and may be fatal. On this account there are deaths from lead-poisoning every year, all of course preventable. In the kidney lead produces chronic Bright's disease. Through this and through its effect on the arteries it also weakens the heart.

The problem of preventing lead-poisoning ought to be a very simple one, but in fact it is not. The reason is that it takes a great deal of trouble on the workman's part to protect himself, and as he does not get hit very often or very severely by the poison, it is very hard to get him to take it seriously. We harangue patients about taking the dust off the hands before they eat, washing the dust carefully off, using the respirator, etc., but almost never can we get people to do it.

If the disease has not progressed to the point of wrist-drop or kidney trouble, we can usually cure it simply by stopping the source of poison. Take a man away from the trade or the water supply from which he gets lead, and he recovers. We also use medicines, but we are not convinced that they have much to do with the cure.

Q. What kind of paint gives lead poisoning?

A. Almost any paint that has any body to it, and is opaque, is apt to contain lead.

Since the habit of cleaning ladies' gloves with gasoline has come up, we see a good deal more of *naphtha poisoning* than we used to. I knew of two girls who fainted because they inhaled too much naphtha while cleaning gloves. This has no serious effects, so far as I know, but we do not know much about the chronic symptoms that may result from inhaling a small amount all the time. In garages, etc., the same sort of symptoms occur, and it is quite probable, I think, that there are chronic poisonings as well, but we do not know much about them as yet.

Acetanilid. Now that drug stores sell "headache powders" to anybody and in any quantity without prescription, we see every year a certain number of poisonings by acetanilid, which is the chief ingredient of most headache powders. I have had patients who have been buying a box a week right along for a year, and thinking it was just like buying groceries. They sometimes get themselves into a very uncomfortable condi-

tion, and there have been occasional fatalities. One of the most important things about *acetanilid poisoning*, that occurs in relation to headache, is that for all we know the headache may be due to the drug. A person begins taking the drug for a headache which was due to something else, but it is perfectly possible that the headache he now has is due to the drug, for if he leaves off the drug he often gets over the headache as well.

The permanent presence of a bluish color to the lips, such as we see temporarily in people who are very cold or out of breath, may lead us to suspect acetanilid. As soon as we take a drop of blood on a piece of blotting-paper we see at once that it is not red, but brown. That is the essential point in the diagnosis. It gets well when people stop the drug, although rather slowly. The occasional fatal cases are from single large doses taken by mistake.

Acetanilid is a very valuable drug in spite of these dangers, and can be perfectly well taken in such a way as to do good and not harm. One does not need to give up taking it altogether.

Alcoholism. I have said something about alcoholism in connection with its effects on the brain in insanity, and also in connection with diseases of the nerves, as a cause of neuritis and paralysis, but there still is a good deal more to be said about it.

We divide alcoholics into three groups, the acute (the ordinary "Saturday night drunk"), the chronic steady drinker, and the periodic drinker. There is not

much to be said that is not familiar to all of us about the symptoms of acute alcoholism. In the vast majority of cases acute alcoholism is not dangerous to the bystanders. The "drunk" has far less muscular strength than usual and it is very easy to push him over. On the other hand, there are a certain number, especially those made drunk on impure alcohol, who get what is popularly called "fighting drunk" or "crazy drunk," and are of course as dangerous as any other powerful animal. When a man has got to the stage of being "dead drunk," — that is, of being unconscious — a great many difficult decisions arise as to what is the matter with him. There was a most interesting article in the London *Lancet* years ago under the title "Drunk or Dying?" detailing several mistakes in both directions; a man thought to be drunk was in fact dying, or *vice versa*.

The reason so many mistakes happen is that the man is usually taken to the police station and left there to sober off, either with no medical attendance or with the political doctor, who is not much better than none. A man who feels sick and is just about to become unconscious from apoplexy, syphilis, diabetes, or any one of a number of causes, often takes a drink, and therefore smells of liquor, and is therefore assumed to be drunk when he is found unconscious. As already said, it may be a very difficult thing to tell whether a man is dead drunk, or very seriously ill, or both. One of the simple tests which will sometimes decide is the temper-

ature. A man who is merely dead drunk never has fever, though he may have fever from the other causes simulating alcoholism.

In the sobering-off process the most striking thing is the tremor. The amount of coarse shaking that there is in an alcoholic who is getting over a drunk is sometimes quite alarming.

There was a recent interesting article in the Boston *Medical and Surgical Journal*,[1] with an analysis, from the point of view of medicine, of one hundred cases of chronic alcoholism as seen in court. There was hardly a normal individual in the lot; I mean that they were abnormal not merely because of alcohol, but by reason of previous brain disease. The great majority of chronic alcoholics are alcoholic because they were abnormal from birth. Feeble-mindedness shows itself in many ways, and one of them is in alcoholism. Slight attacks of insanity may show themselves in alcoholism. Hysteria or epilepsy may do the same. We must realize then that alcoholism may well be, and in the more striking court cases probably is, the result rather than the cause of the man's debilitated make-up.

President Eliot, near the end of his thirty-five years as head of Harvard College, said in a public address that, in all the years in which he had studied the problem of college drinking, he had seldom if ever known a man who drank in college *and who failed to straighten*

[1] Victor V. Anderson, M.D., "The Alcoholic as Seen in Court." *Boston Medical and Surgical Journal*, April 6, 1916.

out and behave himself afterwards, unless there was something wrong in his inheritance. If the college drinker does not straighten out under the pressure of professional work and the need to be of use in the world, he usually turns out to have a pathological inheritance.

The periodic drinker is often referred to as the "dipsomaniac." I think the better students of alcoholism do not use this term much, but the objective facts are that individuals who are perfectly sober, and may even be total abstainers for long periods, suddenly find themselves, so to speak, in the middle of a debauch, keep it up for a certain period, then stop and have apparently no tendency to drink until after a certain number of weeks or months, when the same thing recurs.

We hear a great deal of the physical craving for liquor. I do not believe there is any such thing except in the people who are in the middle of a drunk. A person who has slept it off and got it out of his system may well go back to it and of course often does. But he does not go back from any merely "physical" craving, but generally because he is bored or because he is blue or because he is restless. Most often, I think, he drinks because he has a general sense that he needs something or other to fill up a vacancy, but this is not chiefly a physical vacancy. I think it is the same sort of thing that makes the American people chew gum — they want to be doing something; they are not sufficiently interested in life without abnormal activity.

The subject of the moderate drinker has been discussed a great deal. Anybody who has any wide experience of human beings knows that there are a great many people who take a moderate amount of alcohol throughout their lives without any demonstrably bad results upon their work or their health. At the same time, anybody whose work demands a high grade of efficiency, either of mind or of hand, can easily demonstrate that very moderate doses, such as a cocktail or a glass or two of beer or of wine, impair his efficiency for a certain time. Any one who plays an instrument or runs a typewriter can see the effects. Hence no one who wants to be at his best all the time can afford to drink at all.

One point more: We ordinarily speak of alcohol as a "stimulant." It is worth realizing that it is universally agreed among physicians now, that it is never a stimulant, always a narcotic. The reason it seems to be a stimulant is because after dinner it narcotizes our inhibitions, our modesty, so that our tongues move very freely and often very fast. Certain activities come to light and so seem to be stimulated; but in fact the brakes are taken off of natural self-restraint. A man who is dead drunk and snoring with liquor is narcotized in an obvious way; the man who is supposed to be brilliant after dinner is also narcotized, only less obviously.

When we view the chronic alcoholic as he figures as a social burden and problem year after year, and study

the mental side of the patient, we find far more mental deterioration as a cause of alcoholism than as a result of it. Of course that means that, in our penal and sociological regulations in regard to the alcoholic, we are trying to punish a man who is not responsible and can get no benefit by punishment, or indeed from any moral appeal. He has no power to resist. If we were to treat chronic alcoholics by permanent segregation, as we do the feeble-minded, there would be something to be said for it, but there is nothing whatever to be said for the present method of treatment by a series of thirty or forty sentences. The victim tamely goes down to prison for a few days or weeks, then comes back and gets drunk again. It is a great waste of the community's money and no good whatever to the alcoholic. There ought to be a clearing-house for the whole problem of alcoholism, in which the student of psychology would take a leading part in what is mainly a psychological question and not a social question, nor a physical question merely.

The relation of alcoholism to *tobacco* is an important subject and one on which it is very hard to be clear. If a man is trying to stop alcoholism and is also a smoker, we may be perfectly sure that he won't stop alcoholism unless he also stops tobacco. But we know that the use or even the abuse of tobacco does n't always lead to alcoholism. The person who has fallen a victim to alcoholism and also smokes has got to stop both if he is

going to stop either. Especially the periodic drinker is apt to be a person who smokes and smokes until he gets his nerves on edge and then breaks out into acute alcoholism. I have never seen any *serious* cardiac effects from tobacco in no matter what excess. I don't believe in such a thing as a tobacco heart. I don't believe there are any demonstrably permanent ill effects parallel to the very well-known effects of alcohol.

I have never been able to get enthusiastic in the anti-cigarette crusades, because I know too many strong and healthy men who began to smoke when in short trousers. I can't feel strongly that it does much harm except to people whose powers of resistance are weakened, as is the case with the alcoholic.

The tobacco problem, then, is wholly different in the alcoholic from what it is in the non-alcoholic. In the normal person tobacco in excess produces a certain amount of nervousness and irritability and throat catarrh, but not any serious disease. But in the alcoholic, tobacco is an entering wedge which is very serious.

The psychology of the chronic alcoholic is very like the psychology of the general paralysis of the insane. In a general way it is loss of the finer points of discernment, self-control, and memory, especially of memory. Memory suffers from alcoholism more than any other single faculty.

The *treatment of alcoholism*, in those who are not insane or feeble-minded, is the only branch of the subject that I shall deal with here. The alcoholic, who has

no mental disease or defect back of his trouble, is helped, so far as he is helped at all, by getting at the reason why he started drinking and has continued to drink. Then if possible we try to find a stronger motive, a motive stronger than the thing that has driven him to drink, and thus to drive him out of drink.

I once treated a woman for alcoholism who had been at it for twenty years and who had been through the hands of all sorts of physicians and psychologists, heads of sanatoria, etc. But all the treatment she had received up to the time I first saw her had been repressive. She was sent into the country and put in a sanatorium where she could n't get alcohol from the nurses, but being a person of considerable fascinations, she wielded them over the doctors and nurses and in the end always got the stuff. She was entirely defiant when I was first asked to take care of her; did n't take any interest in the idea of being cured. That is one of the very hardest types of person to cure. I suppose the only reason that I got any grip on her was that I took instinctively a tack opposite to all previous attempts. She was one of the rich people who do not know how to spend their money and she was rather amused by my tactics. Nothing was said to her about alcoholism. I simply tried to find out what her greatest interest was. Her salvation was that she *had* another very great interest besides alcohol. She had a very real interest in a certain subject which I won't mention lest she might be recognized. This she had had for

years, although it had all been driven out by drinking. I succeeded in getting her in touch with other people who were equally interested in that subject. I succeeded in placing responsibility on her and that was practically all I ever did. She had posed as an intellectual invalid. I told her that she had very little brains, but had very real capacity in another direction.

It is now five years since she has had anything to drink. She has no desire for it, wholly, I think, because she has so much interest in something else. The idea does n't come into her mind. She was bored to death, and the technique of outwitting her doctors and nurses was so interesting to her that until a competing interest came on the scene she saw no special reason for devoting her energies to anything else.

I have worked with many other alcoholics to whom I did no good whatever because I could n't discover or create an interest. I don't believe any one has succeeded with a chronic alcoholic who has n't had the good luck to create an interest. With a certain group of alcoholics the trump card is to make them feel that *somebody cares*. They have tired out the patience of those who naturally would care, but if, in spite of that, they discover that somebody else does, it may make it worth while to try again and make a good fight. There are people who don't care enough about their own lives to think it worth while to keep them going. But they may suddenly begin to take an interest in their own lives because somebody else does. But it has to be a real

caring and not a vague or professional caring. It can't be the sort of friendship that we make by the dozen a week. In the second edition before the last of the "Boston Directory of Charities," a certain Boston charity advertised to supply "friendship to all ages and both sexes." That sort of friendship, one which you can furnish wholesale, does n't help the alcoholic. That 's the sort of "friendship" which is given for the *sake of the other person.* The only sort of friendship of any use to us is the mutual one, and that comes in some miraculous way without any pious "reason."

Many an alcoholic has certain times in the day which are dangerous ones. He feels them approaching, he is powerless to fight them, and feels as a person might in the undertow of a big wave. If he is on such terms with somebody that he can telephone at once and say a few words that mean a great deal, and if then that somebody will turn up and stay with him for a few hours, it will sometimes tide him over a period that nothing else on earth will get him by without drink. There are a good many people who have gone to such an alcoholic at such times every month or so for years until he has found his own strength.

Another danger to the alcoholic is extreme mental or physical fatigue. Extreme fatigue sometimes means the let-down of moral restraint; it is dangerous for certain people to get tired out.

The alcoholic is very slow to believe that one glass of whatever is his favorite drink is to him fatal, not be-

cause of its immediate effects, but because it puts him on an inclined plane down which he will run like a heavy body. The ordinary individual can take one glass and not be any the worse for it in any capacity. The alcoholic is the one who can't take one glass without losing his control.

The process of helping an alcoholic is as diversified as that of helping any other sort of people. It may be he has the wrong job. Change of work may then be the key to the situation. That was the key to the situation in the case of the woman whose story I have told in the beginning. She changed her job. Occasionally alcoholics have started drinking because they have no satisfactory fun, no real recreation. More often than either of those, I think it is because they feel that they have no friends or that their friends don't amount to anything. A great many alcoholics are cured by Christian Science, which is an example of the influence of religion of a certain type on the alcoholic. There are many others, for the religious motive once obtained is the most powerful destroyer of bad habits that is known.

Aside from these personal and psychological attempts to help, there is something that can be done on the physical side, not for the alcoholic who drinks once in a while, but for the alcoholic who is in the clutches of the drug and can't get time to turn around. For the one who is so befogged, there is good in going to an institution and getting the poison wholly out of his sys-

tem. That does n't in the least cure him. It does n't in the least prevent him from going back to alcoholism. It simply gets him in such a condition of mind and body that he really can be appealed to by his own best self or the personality of some one outside. If any man has been up continuously for three nights and has had no sleep, he is in rather a poor state to receive a moral appeal, whether from within or from without. Hence the best thing one could do *first* would be to give him a good chance to sleep. So the alcoholic who has been drinking steadily for some time does n't really catch anything said to him and does n't hear his own conscience. All that any treatment that I've ever seen can do, is to put the individual into such physical condition that he has a fair show to hear the voice of his own conscience or of any appeal from outside. But this is well worth while.

I suppose most of you know that the various patent medicines serve in some places the same purpose as alcohol. Lydia Pinkham's Vegetable Compound and Hostetter's Iron Bitters have about the same amount of alcohol as alcoholic stimulants, and are more expensive. One of the cases I've last treated got drunk on aromatic spirits of ammonia. We may not be able to buy whiskey at the apothecary's in a "dry" town. Aromatic spirits of ammonia are about twice as strong as whiskey.

Dr. Neff, of the Massachusetts Sanatorium for Alcoholics, likes to speak of the whole matter of alcohol-

ism in the same terms as he uses in phthisis. We can cure incipient cases, he says; not the advanced chronic cases. There is a great deal in it, although I think a psychological classification, more like Dr. Anderson's, is still more significant.

Opium and its Derivatives — Morphine, Heroin. Eighty per cent of the people who have the morphine habit in this country have acquired it from doctors. So Dr. Alexander Lambert states in "Osler's Modern Medicine." Eighty per cent acquired it because of drugs given them by physicians. I think, on the whole, the greatest single evil I know in medicine is the abuse of opium and morphine. It is a tremendous temptation to a doctor. People want relief. They want it right off, and a man who is trying to make a living and keep the good-will of his patients may find it almost impossible to go away and give no drug as an immediate relief. In the Massachusetts General Hospital or in any place where one does medically only what one believes ought to be done, I suppose not one person in a hundred gets any morphine at all, and not one in ten thousand gets it more than ten days. Any one who gets it for ten days is in danger of contracting the habit. If we ever hear of any one taking morphine for more than ten days, that person is in need of our help or some one else's help. Sometimes the habit is acquired perfectly accidentally. The doctor meant that the drug should be discontinued, but it is not discontin-

ued. Ten days is enough to form a "set" of the tissues which demands the drug.

The most important thing that any one can realize about this problem of morphine is that after it is taken for a little while it *causes pain.* Of course it is taken at first to relieve pain, but after we have been taking it a little while, it produces pain which then it relieves. The great importance of that point is this: many a person feels he can't stop, can't face the terror of the pain for which originally he took it. But often it is true that *we can stop morphine and the pain at the same time.*

A physician came to me two years ago with tabes dorsalis and the lightning pains of that disease, for the relief of which he had contracted morphinism. He had often thought of giving up the morphine, but had always said to himself that he knew without the morphine he could n't stand the pains of his tabes dorsalis and had rather die than try. He had never heard what I have just explained, that morphine can produce pain on its own account. He had been out of practice for a good while. He thought every one looked down upon him, that no one could help getting some notion of what he had and despising him for the syphilis back of it. I told him his pain might leave him if he quit morphine and took the Towns treatment. He has never had any pain from that time — two years ago — to this. He found that much of the trouble which he had in his back and legs (weakness and staggering) was the result of the drug and not of his tabes. There is no

more pain coming to him because of his tabes; he was keeping up the pain by the very thing he thought relieved it. He could walk straight and stand up straight without pain, when once he quit his morphine. He found that he could get back into medical practice, got some self-respect, and within a year he was all right. He had a good inheritance. He was not a degenerate in any sense.

I said eighty per cent of the cases known to Dr. Lambert were due to the opium given as prescriptions by physicians. A considerable portion of the remaining twenty per cent are doctors themselves. The profession which figures most numerously in the list of occupations of those who get morphinism is the medical profession. If anybody thinks that fear and knowledge ever kept anybody straight sexually, he had better consider this fact. Who knows best the dangers of morphinism? Why, of course, it is the doctor. And who gets it oftenest? The doctor. Long ago I made up my mind that knowledge did not keep anybody straight in matters of sex, in matters of hygiene, or in avoiding a habit like morphinism.

In this country practically nobody gets those beautiful dreams we read about in De Quincey's "Confessions of an Opium-Eater." Morphine is taken, not to bring about a beautiful state of mind, but to get some one out of a hellish state of mind. It is not for pleasure that it is taken, but to relieve discomfort. De Quincey took laudanum, which nobody takes nowa-

days. Laudanum is an alcoholic extract of opium. Chinamen always smoke opium; but white people almost never smoke it. Perhaps this difference in the way the drug is taken explains why Chinamen take it for pleasure, while Americans take it, never for pleasure, always for relief.

I have said that opium or any of its preparations taken more than ten days is a danger; sometimes it is a risk that we must take or a necessary evil. A person with a perfectly hopeless cancer which can't be operated on, and which is torturing the patient, rightly takes opium if the doctor feels perfectly sure that the man is near the end of life. However, one must be absolutely sure of the diagnosis before he takes such a responsibility of making a morphinist of a patient.

I once went to see a lady supposed to be dying of cancer of the stomach. But like Charles the Second, she seemed to be taking an unconscionably long time about dying, and her friends began to wonder why she did n't "get well or something." She had a tumor, a lump in the region of the stomach, which lump, coming as it did at the age of seventy with severe stomach symptoms, caused the doctor very naturally to make the diagnosis of cancer of the stomach. Then the lump began to disappear and by the time I got there, there was no lump. The question arose as to what else besides morphinism she then had, and in my best judgment she had nothing else. The doctor was not at all ready to explain that to the family. It did n't look

particularly well for him. He had been helping the old lady in a pleasant way into the next world, but she showed no special tendency to take that step. I told him that either he or I must tell the family what the situation was. He asked me to tell them. The old lady got well. It is all right, then, to be humane and ease our patients into the next world, provided we are *quite sure* that their time has come.

The morphine situation in this country has changed a good deal in the past year and a half, owing to the passage of the Harrison Law. It seems to me to be doing some real good. The law does n't forbid anybody to take morphine. It merely makes it necessary that a physician who prescribes morphine, opium, or heroin should do it in such a way that the United States Government knows who is doing it, and how much each doctor in the country is giving. Prescriptions are written on a special blank supplied to us, and as each of us has a particular number that no other doctor has, that number has to be put on the blank, whereby we can be identified, so that the United States Government, if it chooses to take the trouble, can find out what doctors are giving morphine, and if they are giving more than they should. Without prescriptions on those official blanks one cannot get morphine to-day unless the law is broken, and the apothecary is distinctly afraid to break the law. It is certainly more difficult to get morphine contrary to law to-day than it has ever been before.

Acute poisoning occurs as a rule only in young people who take morphine with suicidal intent. Four grains will ordinarily kill. But in a person who is used to it forty grains may produce no effect whatever. Ordinary medical doses are one fourth of a grain or less. The acute cases are characterized by more or less profound sleep with contracted pupils and extraordinarily slow breathing. Most of us breathe about eighteen times a minute; the person in coma from morphine breathes five, six, or seven times a minute, and this with the "pin-point pupil" of the eye, very much contracted, is generally enough for diagnosis. Part of the morphine is excreted in the stomach. Hence part of the treatment is to keep washing out the stomach again and again. If we don't do that, the drug is reabsorbed in the stomach and the person keeps it in his system. If we can keep a person alive for eight hours in acute morphine poisoning, the poison is usually excreted through the bowel and kidney. So our problem is to keep him alive for that period of time. The treatment simulates cruelty. We must make the patient sufficiently uncomfortable to keep him awake if possible. I have walked people sometimes up and down for hours in the night to prevent them from lapsing off into this sleep. We have no antidotes which accomplish much. The best antidote is pain; that we apply.

Persons with chronic morphine habit may be suspected of it (1) because they do not keep their morning engagements. They almost never have good nights

and as a consequence do not get started in the morning. Hence to the best of their ability they never make any morning engagements, and if they do are always very late. The reason I first suspected a doctor, later proved a morphinist, was this. He called me in consultation and I reached his town at nine o'clock. He was n't there to meet me, and I stayed at the station until nearly ten o'clock when he turned up. This is the sort of thing people do in the comparatively early stages of the trouble. (2) In others we may notice that the quality of the voice in the early morning is inexplicably *hoarse*, and this may well be due to morphine. (3) They are generally notably pale and notably thin. (4) They are very capricious, subject to extraordinary ups and downs of temperament. None of these symptoms are always seen or are in any way reliable in diagnosis. We probably all of us know morphinists whom we have never recognized. None the less the symptoms given are of value as pointers.

As to the cure, the first thing to be said is that nobody is ever cured at home. It is dangerous to make a sweeping remark like that, but certainly it is the rarest thing in the world to be cured at home. The patient can get the dose of morphine down from ten to five grains and then to three a day, possibly lower; but at some point he always sticks. It is perfectly easy to cut it down to within a grain or two of zero and practically impossible to get beyond that point. If the doctor tries to treat a patient in his own home, there is always some

concealed supply of the drug which he cannot find. Hence there is no satisfactory treatment of morphinism without institutional control, where the first thing to be done to a patient is to have him stripped and given a bath. During this his clothes are thoroughly searched and all the belongings gone through. No morphinist can be trusted to speak the truth about his morphine.

To take the drug away without doing anything else to counteract the effects of withdrawal is to subject the person to the most horrible torture that I know. I've done it a number of times before any better treatment was known, and I think it causes the most awful suffering I've ever seen, suffering which lasts weeks, not merely days. There are a great many institutions and a great many so-called cures for morphinism, but practically all of them are fakes. Practically all of the "cures" contain the very thing they say they are taking away and a good many of them are run by physicians who take morphine themselves. The greatest scandal in medicine is the existence of the institutions of this kind. There may be others besides the two which I know to be honest. These are the C. B. Towns Hospital in New York and a similar hospital in Brookline, Massachusetts. The Towns treatment was gotten up and used by a layman, not a doctor. After he had made a competence he decided that he would like to serve the public. He gave the formula for the treatment to Dr. Alexander Lambert, and he published it

in all its details in the *Journal of the American Medical Association*.[1] Dr. Lambert did nothing but carry out what Mr. Towns taught him. I have sent a good many people to the hospitals where the Towns-Lambert treatment is given in New York and in Brookline. It has worked a cure and a permanent cure. I have sent people there who had the habit for many years and who have n't taken any morphine since.

I am not at all enthusiastic about the same treatment for alcoholism. It is not much torture to stop alcoholism, and when we once have stopped, it is comparatively easy to go back to it. But with morphine it is torture to stop and comparatively easy to stay "stopped." The whole benefit of the Towns treatment is to make it possible for people to stop morphine without great torture. Whatever suffering there is is over in two days, and there is not much even in those two days. The essentials are purgation and belladonna. The latter is given every hour, day and night, for the first twenty or twenty-two hours, and during that time we give doses of purgatives that are a scandal. Mr. Towns is a man of very striking speech though his metaphors are not always elegant. "If you want to give purgatives to a drug fiend," he says, "measure out a dose for an elephant, and then double it." That is about the way we give it and it works tremendously well. Towns himself is one of the most forcible per-

[1] *Journal of the American Medical Association*, Sept. 25, 1909, and Feb. 18, 1911.

sonalities I ever knew. When I first heard about the treatment, I thought his personality was a large part of it. But since then the same treatment has been established here in Brookline under ordinary conditions and without Mr. Towns, yet it works just as well. I think it is a great boon to humanity. The weak point of it is that it costs so much. It is not at all expensive as far as the medicine is concerned, but as administered in institutions to-day with paid doctors and nurses, it is a very expensive proposition. The cost of the Towns treatment averages about one hundred dollars. Some pay more: a few pay less. It is a lump sum for whatever time they stay. They don't pay by the week, which is a great advantage. The average stay is ten days. The last eight days are merely spent in getting toned up generally and not in having any special treatment. The drug is all gotten rid of in the first two days. We sent doctors on to New York to learn the tricks of the trade, as Mr. Towns himself knows much more about it than any doctor does.

Degenerates, prostitutes, or criminals who turn up in prison or in the slums with these habits, are not to be helped much by any cure. They have no sound stamina of character and no interest to hold them after they have been cured.

The *cocaine habit* is comparatively rare. There are very few cases except those complicating morphine and alcohol. The habit is generally due to low-grade mentality. Cocaine is used very commonly by prostitutes

and those of the jail type. It is generally taken as snuff or as a nasal spray. One wants to be always on one's guard against sprays and other throat and nose remedies which relieve very markedly and at once. They generally contain cocaine, and are always dangerous for that reason.

CHAPTER XVII

INDUSTRIAL DISEASES — SKIN DISEASES

I HAVE a little more to say about industrial diseases before I finish that subject and go on to skin diseases. The first thing I want to say about it is that it gives rise to more examples of the fallacy expressed by the Latin words, "*Post hoc, ergo propter hoc*" ("*After this, therefore because of this*"), than any other experience that comes to physicians.

A man in a hurry died once. He was in a hurry and then he died. The fallacious inference is that he died *because* he was in a hurry. The more we think of this, the more we see all around us the disasters that happen because persons can't reason straight. It is the duty of every physician and every one who associates himself with physicians to do his or her part of the enormous job of straightening out the world in relation to that fallacy. It occurs in every department of life and causes disasters in every department of life.

In industrial diseases fallacies of that kind are especially numerous. Mr. So-and-So lifted a heavy weight; the next day he noticed that he had a chill and the doctor said he had pneumonia. Therefore (the false reasoning persuades us) the lifting of the heavy weight *caused* his pneumonia. The human mind demands a cause for everything and we respect the hu-

man mind for this. But unfortunately there are not known causes enough to go around. You have had a chill, you have had fever, and why? The Lord only knows. The doctor can find no disease. But meantime you demand a cause. You know that you got your feet wet, so you say the chances are that this caused the chill.

A man called me up once, out of a well-deserved sleep about three in the morning, to come to his house as fast as I could. I had not learned then that hurry calls rarely deserve to be attended to at once. I found a patient in bed and in great agitation. He said that the afternoon before he had tried to fix some curtains and had climbed up on a chair. His wife had wanted him to fix those curtains for a long time. He did n't realize at the time that it did him any harm, but a few hours ago when he went to bed he found a tumor right on his breast bone. Then he remembered that, when trying to put those confounded curtains up, he slipped and came right down on his chest. He thought the lump on his breast bone had grown in the hours since he had noticed it, and he could n't stand it any longer without knowing what it was. I found that it was a perfectly natural part of his skeleton. He was born with it and would have it to the day he died, but he was quite sure that that thing was n't there when he went to bed the night before. He was perfectly willing to swear that it was n't there, whereas I was perfectly willing to swear that it always had been there and al-

ways would be there. This illustrates two things: the fallibility of human testimony in general and the necessity of finding at once some cause, even a false cause, for everything. When one finds something the matter with him, one goes back to the nearest event that is blameworthy according to the popular current notions. The nearest blameworthy event is, perhaps, that one fell down, or lifted something, or that one got cold, or one got one's feet wet. Hence it is that events of this sort get hitched up in the popular mind with so many diseases really quite independent of any such cause.

Most people who get sick have to work, and when they are looking for the causes of their sickness it is getting to be more and more the custom to blame one's work. This is true especially the more one hears of "industrial diseases," of workmen's compensation, etc. This habit leads to a great number of mistakes and makes it difficult at the present time to know *what are industrial diseases and what are not.*

Take the most familiar of all the puzzles. A man has tuberculosis. He has worked in a dusty place. Did the *dust* cause the tuberculosis? It is very easy to say, "*Post hoc, ergo propter hoc*"; the tuberculosis resulted from working in a dusty place. But, in fact, the relation of tuberculosis to dust is a difficult and complicated matter. There are a few facts which we know about it and a great many that we don't know at all.

In the first place, we must distinguish the *kinds of dust* in their relation to disease. There is a kind of dust

which is good for tuberculosis. That is one of the few things we know. Coal dust, such as the miner gets in the mines, we all inhale to a certain extent in the cities, whereby our lungs get to be a handsome dark gray instead of a light pink. But miners, who inhale the most of it, very seldom die of tuberculosis. There is a reason for this. The coal dust makes in the lung minute scars, so small that they don't injure it to any extent, but big enough to wall in the tubercle bacilli, which are present in almost all of us sooner or later.

Coal dust and smoke carbon, then, are good for tuberculosis. But stone dust and metal dust are bad for tuberculosis. Stonecutters, especially those who work indoors where the dust is n't blown away, have a very much higher rate of tuberculosis than other men of the same wage and same social conditions.[1] I add, "the same wage and same social conditions," because nothing makes so much difference in tuberculosis as the low wages. The low-wage trades have the most tuberculosis. An occupation in which there is abundant tuberculosis is that of the laborer outdoors. That is low-paid work and goes along with alcoholism and poor nutrition, bad housing, etc. Men with low nutri-

[1] U. S. Census Bureau, *Tuberculosis in the United States* (1908), gives the following rates per 100,000 of population:—

Marble and stone cutters	541
Laborers	415
Iron and steel workers	251
Textile workers	213
Journalists	189
Lawyers	144
Miners	130

tion and high alcoholism are frequently the ones who get tuberculosis.

The metallic dust that comes off scissors in the process of scissor-grinding, or comes off metal while it is being polished at the emery-wheel, is certainly dangerous to the lungs. These two things we know: that coal dust is good and metal dust is bad for the lungs. But that is about the limit of our knowledge.

We don't know much about the effects of the dust that we have in textile factories, the lint particles, the cotton and wool dust in the air. People who are breathing that kind of dust have some tuberculosis. But the question is, Does this dust cause the disease, or is it due to an infection from person to person or to a diminution of vital resistance from some cause outside the shop? We cannot infer that merely because a person has a dusty trade it does him harm. It may have no bad effects whatever. It may have an effect on other organs besides the lungs. We don't know much about it in other organs except that it causes in the throat and nose irritation which blocks the nose. This anybody who works in dust rightly attributes to the dust. But irritation of the throat and of the nose are so prevalent and on the whole so trivial that we don't as yet do much about them as industrial diseases.

One of the few well-known industrial diseases, which has recently become well known in this vicinity owing to the tunnel construction in South Boston, is *caisson disease*. Its proper name is "compressed air disease,"

because wherever we get compressed air we get this disease, whether in a caisson or anywhere else. The caisson is an enclosed compartment in which men work under water when constructing a tunnel or bridge pier under water. In a caisson men work in air which is tremendously compressed. The object of compressing the air is to make it help to hold up the walls of the tunnel. When air is under three or four times the ordinary pressure, it plays a considerable part in holding up the walls of a tunnel and therefore makes it easier to build.

But a man working under those conditions is subject to danger, provided he does n't take a great deal of time in getting used to this compressed air on his way into the caisson and also in getting used to ordinary atmospherical pressure on his way out.

When we take a train that goes through a tunnel swiftly, as, for instance, the tunnel of the Pennsylvania Railroad, close to its station in New York, we are apt to feel a difference in the air pressure on our ear drums. When a train rushes into a tunnel like that it exerts a certain amount of suction, acting like a piston in a tube. Hence the air in the train is rarefied for a time, and we feel it on our ear drums. If we swallow once or twice and so force into the Eustachian tube, and so into the middle ear, the same air that there is outside, we are relieved.

That sort of thing on a much greater scale is what the workmen go through every time they go into the

caisson or come out of it. If one does it gradually, taking two hours or so in the process of going in and in the process of coming out, getting used to each successive pressure by waiting twenty minutes in one pressure and then going to double that pressure, there is no considerable danger. But if men go in and out rapidly, as it is ordinarily done in most tunnels where there is not very active medical supervision, they are very liable to serious disease and quite liable to death. There are always fatalities. There have been a number of cases of this disease in the Massachusetts General Hospital since the South Boston tunnel was begun. The commonest lesion that we see is rupture of the ear drums; that has happened a great many times in this tunnel. As they come out of the tunnel the air on the inside of the ear drum is so much heavier than the air outside that the drum is pushed out and broken. On the way into the tunnel the conditions are reversed.

Pains in various parts of the body ("the bends") occur in about 90 per cent of all cases. They vary from mild to very severe. Vertigo ("staggers") occurs in about 5 per cent.

More serious is caisson disease of the spinal cord, with paralysis and death, a disease entirely preventable but for the facts of human nature. We know exactly how to prevent it, but the difficulties are pretty equally balanced between the employer and the employee. No matter how many times an employee has been told to go in and out slowly, he is sure to notice

that some of his fellows have gone quickly and yet have n't got the disease. Men almost always want to take their chances of disease unless they are forced by law to go as slowly as I have indicated.

There are regulations in England whereby it takes about two hours before a man is allowed to bear the full pressure on the way in and on the way out. Neither for the employer nor the employee is it a paying process to care for health, hence regulations are very hard to enforce. There is no law in Massachusetts on the subject that I know of, and the condition of things is not at all satisfactory now.

Conceivably tunnels could be built without compressed air and this would be a good thing for the workmen; but it is so much more expensive that there is no prospect that they will be.

The treatment of compressed air disease is recompression by means of the usual locks, where the pressure is raised quickly to the working point. This gives relief in most cases. Slow decompression is then carried out.

Q. Does the law require locks?

A. There is no law about that because the thing would enforce itself. They must have locks in order to keep up the pressure on the inside, to keep the compressed air from leaking out, and, on the other hand, to enable the men to get along at all. If every one got the disease every time he violated the rules, it would be much simpler to enforce them. People are different in their susceptibility to this as to all diseases. By none of the industrial hazards do men get caught every time, so they usually take their chances.

Diseases due to heat and cold are hard, indeed, to say anything definite about. People get used to working in high temperatures and they get used to working in low temperatures, and we don't know enough to be sure that any definite disease is due to temperature except in extreme cases. Some of the worst hazards seem to be in cold-storage plants, where men go very suddenly from hot to cold temperatures and back again. Even there we cannot give a name to any disease or symptoms due to the hazard. There is a strain upon the individual presumably, but we don't know.

Muscular strains are due to cramped positions or to excessive use of one group of muscles. This is also very difficult, indeed, to bring under any occupational disease. It is not the people who lift the heaviest weights who get the strains. It is the people who for some reason or other are not equal to that particular weight, heavy or less heavy. We can't make any rule in this case as to what is proper and what is not proper. It is a question of knack in the way the muscles are used. Again, it is very hard to make sure what condition the man was in when he underwent a certain strain. He may have been in a condition so that he would get hurt whatever he picked up.

I have spoken earlier of a case of heart disease attributed to lifting one corner of a piano. The evidence was convincing to me that the man had the heart disease before he went into this job. Even if he had been

sitting still in a chair the new symptoms might have appeared in the way they did the day after lifting this weight. We do not know whether the strain did it or whether it was a mere coincidence.

Occupational skin diseases are generally of the eczematous type and affect chiefly the hands of candy makers, bakers, and all who deal with sugar; also masons (lime and cement), stonecutters, and all who handle irritating drugs, anilin colors, tar or paraffin.

Change of occupation is advisable in all severe cases.

There is a similar difficulty about the *occupational neuroses*, of which "writer's cramp" is the only form popularly known. Writers do not generally get it from simple over-use of the hand muscles, and it is n't generally known how they get it. It appears in all sorts of people, including some who do very little writing. When it does come it is chiefly pain and not muscular cramp. Another example is "tennis elbow" and "violin elbow," which are terms that explain themselves. Cigarmakers get occupational neurosis in their hands. A certain number of typewriters get it, but the outstanding fact is that the people who use their muscles the most are not the ones who get these neuroses. *The neurosis generally occurs in people who have used their hands an ordinary amount and no more than hundreds of people who have no trouble with their hands.* There is something else in the person, some *x* or "nervous constitution," whereby even a moderate amount of use of the muscles may bring about this

condition. The thing that makes it natural to believe that the muscular work is itself the whole cause of an occupational neurosis is that the cessation of the muscular work generally cures the trouble, especially the cessation of the particular act one has been doing. A person may be able to use his hand quite well in a different way. I remember a person who could n't write at all without great pain if he held his pen in the ordinary way, but after he was taught to keep the pen between the second and third fingers, so that he did not make a terrific contraction of all the fingers when he wrote, the whole thing disappeared.

As a rule people who have these neuroses are found to be writing with their shoulders and tongues as well as with their fingers. That is an element in the trouble, — the wrong application of force or incoördination. If we can get a person to write only with the parts necessary and not with all the other muscles in the body, we have sometimes done a good deal to check the trouble.

Occupational neurosis, then, is something that usually happens to persons predisposed to it by x in their constitution and not to any one who happens to be exposed to a great strain or forced to do a given process a great many times. If we could find out which people have x in their constitution before they undertake a trade, we could prevent a great deal of misery. I hope that some day we shall be able to do this. We need some test to show that a person is more sensitive or

vulnerable by monotonous repetition of movements than other people.

There remains the general question of *industrial overstrain* in the sense of overwork. It is a difficult matter to estimate for the reasons already given. I have almost never known any one overworked who did n't worry. All "overwork" in the higher-paid jobs is really worry; but I have n't had enough familiarity with the lower-paid grades of work to say anything about overwork there. I have an idea that there *is* such a thing as overwork among the lower-paid occupations. Seven days a week and twelve hours a day certainly seems overwork. But it is very hard to make any definite statements: it depends so much more on the physical and psychical conditions under which the work is done, on the general nutrition and habits of the individual, than it does on the hours of work or the job. At one time we got to the point where we thought we could put some salt on the tail of this particular phenomenon and catch it. We were told that there was a "toxin of fatigue." But that has already begun to vanish into the limbo of medical fads and fancies. If a person is tired he is tired, and that is all there is to it. We don't know what fatigue is any better than we did.

All this is very vague and most unsatisfactory, but that is the present state of our knowledge, in my opinion.

The diseases in which we can find a lesion in the

system — caisson disease, for instance, in which we can prove that air pressure did it, or lead-poisoning or benzol-poisoning, in which we can get a characteristic lesion — are very, very few, and there is an immense number of the type in which it is more or less guess-work how much the occupation had to do with it.

Diseases of the Skin

Pruritus means something that itches. It is a no more definite term than that. It is not a disease, but a symptom. A person who has an itch, without anything more, has what is called *pruritus*. It is important to distinguish these words, which are merely Latinized or merely Greek equivalents of simple English symptoms, from words which really name a disease, — that is, a group of symptoms belonging together.

Erythema means *redness*. When one is burned in the sun, one has an erythema. It does not mean anything more than that. It occurs in all sorts of diseases and in health. A scarlet fever rash is erythema, and there are many more.

Macule means a red or brown spot on the skin.

Papule means a spot that is raised.

Pustule is a spot that is raised and has pus in it.

Vesicle is a water blister.

Those are very common terms which are worth knowing.

Eczema is the commonest of all the skin diseases that

come to a physician. It is brought about in many cases by an obvious irritation. A chocolate-dipper, dipping her hands into the sugar, if she is peculiarly sensitive to it, will get "chocolate-dipper's eczema"; twenty other girls in the same occupation will not. If we could test that girl's skin before she went into the trade and discover at the start that she has a particular sensitiveness in relation to sugar, it would be good for the girl. We could warn her against chocolate-dipping.

Parasites, such as head lice, are a very common cause of eczema about the scalp and eyes. When a doctor finds eczema he at once looks for its cause. Sugar in the urine brings about eczema of the genitals. Friction of one part of the skin over another, as about the breasts in women, will bring about eczema in the same way, especially in hot weather. Those are familiar examples of eczema from irritation.

There are a great many cases of eczema not yet explained at all. The tendency nowadays is to explain them as something wrong with the food. Dr. C. J. White, of the Massachusetts General Hospital, has been experimenting to see if he can connect the food with the eczema in children and adults. His work is not yet completed, but it seems possible that people who are subject to eczema can be shown to be abnormally sensitive to one or another food. We now test foodstuffs by putting a little egg or meat under a person's skin and noticing whether the skin is irritated by it more than the average. If so, then the same food

substance carried into the body by mouth is *possibly* the cause of the eczema.

The extremes of life, babies and old people, are especially subject to eczema. With babies it sometimes seems as if the eczema lasts until they grow out of it or grow immune to it, but I dare say that is an unfair account of it. Occasionally we can relate the eczema very definitely with something wrong in the baby's diet. Social workers are often called upon to help out in the treatment of eczema by persuading or helping or encouraging the individual or his mother to keep up the treatment. People get very discouraged, and often take just enough treatment to give themselves a lot of pain without persevering long enough to get any good from it.

Acne is the familiar "pimples" which people are especially subject to about the time of adolescence, probably because it is in some way connected with the changes in the skin at the time of adolescence. Acne is due to bacteria in the skin. We have bacteria in our skin deep beneath the surface, and when our powers of resistance are lowered in any way, they multiply and produce an acne lesion. A precisely similar lesion is sometimes produced by drugs. Two very familiar drugs, the iodide and bromide of potash, will produce an acne eruption discouraging the skin so that the ordinary bacteria flourish there.

There are two things that can be done for acne. One

is cleanliness. It has long been noticed that pimples are very prone to come across the upper part of the back and shoulders, which is a portion that often escapes thorough attention in the process of the morning bath, does not get thoroughly scrubbed or thoroughly towelled. Hence more attention to that place will often stop acne. There are some cases, then, where cleanliness is all that is needed. There are other cases where it does no good.

Obstinate cases have been helped by vaccines. A vaccine made from the bacillus present in the skin, and then injected, sometimes stops the acne by rousing a person's vital powers.

An important thing to know about acne is that it often occurs in adolescence and stops when a person grows a little older. We see many a young man or woman very much discouraged about it and wondering if it is going to last all their lives. But they will find that as they grow older it will disappear.

Boils. When an acne pimple goes deeper (or starts deeper) than usual, we have a "boil." The cause is the same as acne in some cases. In others, general condition plays a very large part. Overtrained athletes, and others whose power of resistance is below par, are smitten with boils, sometimes in crops and over months of time.

One boil may infect the adjoining skin and start another. Hence the most scrupulous cleanliness is essential. Each boil should be kept covered (with a

collodion dressing or otherwise) so that its discharge can by no possibility get on the clothing or spread to the skin near by. Clothing (e.g., sweaters or trunks) which may have gotten infected, should be thoroughly boiled.

Most boils heal without interference. If healing is delayed, or if the pus is obviously working its way "underground" for want of outlet, the boil should be opened. A doctor is the best judge in most cases and in all doubtful cases as to whether an opening is needed or not.

If boils recur frequently or are unusually slow in healing, a vaccine made from the germs in the pus is sometimes useful in hurrying things up.

Carbuncles. When pus works its way very deeply among the fat cells on the back of the neck (occasionally elsewhere), it may burrow in various "shafts" like a mine. Serious blood poisoning rarely occurs, but can be prevented by proper surgical treatment and vaccines. The cause usually assigned is a lowering of the patient's vital resistance plus a working-in of germs, assisted by irritation and pressure of clothing on the back of the neck.

Impetigo is seen especially among young children, particularly on the face. It is contagious from part to part of the body by touch. Little vesicles and pustules form and dry up in a few days, but the patients reinfect themselves from part to part. We don't often see it except in children and usually in very young children.

It is a school-children's disease and has no serious effects; it is merely a bother, but it is common.

Pediculosis is a disease which every social worker and teacher should be able to recognize and to make a diagnosis of. The diagnosis is not difficult, but it may be a matter of great importance to us, whether we ourselves contract it from those with whom we deal or whether we labor to prevent its spread. The characteristic thing is the way the little egg sticks to the hair. And it sticks. The little white particles of dandruff blow off. We can't blow this off. Another point is that it is always fastened on parallel with the hair, never across it. There is nothing else of this size and look that grows parallel with the hair. Those two points enable us to make an infallible diagnosis. A great many physicians who don't happen to have this kind of practice don't know about this disease. But I think every social worker should be an expert in its diagnosis.

The commonest treatments are larkspur and kerosene. Either of them will do the job.

Until recently there was no public conscience on this subject. It was so common that nobody paid any especial attention to it in the public schools. Now there is getting to be a pretty strong public opinion on the subject, and I think it will soon disappear. It does no harm, of course, except that it produces attacks of eczema at the roots of the hair with itching; to these I have already referred.

Scabies (or "the itch") is a much less common disease. There is a good deal more scabies in Boston than in most parts of the country, because of our large immigrant population. Scabies is due to a little beetle which burrows its way into the skin; the characteristic lesion is a hole such as any one would make if trying to burrow into the ground. It is popularly called "itch," which describes its symptoms. It comes most where the skin is thinnest; that is, between the fingers. It spreads from there to other parts of the hands and body.

We can't treat an individual as an isolated unit, but have to treat the whole family as a unit. It is very easy to cure, provided you treat all members of the family at once.

Dermatitis venenata is the general name for inflammations of the skin which come from poisons outside the body. Ivy, sugar, as well as many other substances, may cause this. Ivy poison is the commonest type. Of course there are other plants beside poison ivy that would do it. Most of us have seen or experienced poison ivy, and do not need to be told of this long Latin name which is attached to it. Scrubbing with soap and water when we are first poisoned, and then again and again later, is the best treatment.

Psoriasis is always getting mixed up with cirrhosis of the liver because the spoken names sound a good deal alike. It is a disease which practically has no symptoms at all and is never noticed by patients unless

it shows on the face or hands; but we don't like the looks of it. It is a chronic red scaling rash without any itching or other disturbance, which occurs most on the front of the knee, the tip of the elbow and the scalp. I often see it in the course of a physical examination, but say nothing about it. But in a certain small percentage of cases it gets on the face or spreads over the whole body and then gives a lot of trouble. It is a very hard disease to treat. There are very few dermatologists who say with any confidence that they can cure it. It comes and goes. When I was investigating Pang Suey, the Chinese "herb doctor," I saw a case of psoriasis which he was supposed to have cured. I did n't feel it necessary to tell the lady that the rash would probably come back in a few months.

Urticaria is our old friend the "hives," which most people have had some experience with, and which in the last year or two has become a subject of special interest because of certain fundamental ideas about disease which hives serves to illustrate. I refer to anaphylaxis, a subject already mentioned in connection with asthma.

Anaphylaxis is a special sensitiveness to certain protein substances. Asthma is one instance of what happens to us because of our sensitiveness to feather pillows or a horse's breath or to pollen, or other kinds of substances. It is an individual thing, born in us, — luckily born in comparatively few folks, and is always

connected with a particular substance. Asthma and hives are two of the best-known examples of anaphylaxis. We have all known persons who have hives every time they eat lobster and certain kinds of shell fish. A friend of mine has the most intense form of anaphylaxis caused by eating egg albumen. If she takes egg in any food, although she does not know it, she will break out with an attack of hives very soon after she has taken it. This particular form of sensitiveness is rare. Some people break out with hives after eating rye or oatmeal on account of sensitiveness to these particular carbohydrates.

We don't know what the process is that we call "hives." Some people have it, as I have said, from certain foods. They take a laxative and get better. There are people who always get it under certain emotional conditions. Presumably faulty chemistry is brought out by these emotions. Some people get it when they exert themselves too much in hot weather. It is a very tantalizing thing, and I think it is safe to say we can never cure it unless we find the cause and remove it. Nothing that we can do on the outside makes any difference, because it is not a disease of the skin any more than scarlet fever. It merely happens to show itself on the skin.

Some people who have these red, angry, itching lumps on their skin have the same thing in their throats and clear down into the lungs. There may be pretty sharp paroxysms of bronchitis caused in this way.

Hives may also occur in the intestines and cause severe pain sometimes mistaken for appendicitis.

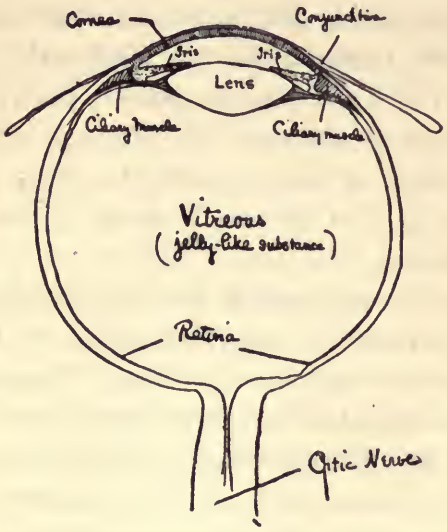
A person who has been subject to such attacks and gets a sudden inexplicable pain may be suspected of having an attack of internal hives.

CHAPTER XVIII

DISEASES OF THE EYE AND EAR

The Eye

Fig 30. Cross section of the Eye



THERE are certain parts of the anatomy that I have to go over for the sake of the names: first, the *cornea*, the front window of the eye; behind that a space filled with watery substance, the "aqueous humor"; then the *iris*, the colored part of the eye, blue, or brown, or

whatever color our eyes are; behind that the *lens*, which is a transparent, glassy-looking, solid thing, hitched at each end into a muscle which has the power of pulling tight from both ends, so as to make the lens flatter, or letting up so as to make the lens more convex. Of course, the lens does different things to the light that comes through it, according to whether it is very flat or very convex, and the lens in the human eye is vastly more useful than it could otherwise be because it has this property, through its muscle, of flattening itself or thickening itself. Behind that is the main cavity of the inside of the eye, filled with a jelly-like substance called the *vitreous humor*. Everything behind the lens is vitreous; everything in front aqueous. The back of the eye itself, the *retina*, the sensitive, seeing part of the eye, is simply the inside back wall of the eye.

As seen in cross-section through the lids the *conjunctival sac* is like a bag whose mouth has been sewn up, so that it is a perfect closed sac. It dips down behind the upper lid of the eye, stretches across the front of the eye, and dips down behind the lower lid. I have not tried to put in the tear duct, because it has not any very important relation to the diseases that we are going to study. The white part of the eye is called the "sclera," and has very little importance except that when a person gets jaundice it is stained yellow. Taking each of the parts named, we have eye troubles corresponding: *conjunctivitis*, *keratitis* (in the cornea),

iritis, *cataract* (in the lens), rare and unimportant troubles in the vitreous humor, and finally, *retonitis*.

Conjunctivitis, inflammation of the conjunctival sac, is most familiar in "pink-eye," which is a contagious conjunctivitis due to a recognized and definite micro-organism, running a self-limited course of somewhere between three days and two weeks, and getting well of itself. We do not know anything about it except that it is contagious and that it is mild.

The only other conjunctivitis, and that is of very great importance, is the one that practically all social workers are familiar with as *gonorrheal ophthalmia;* it starts as a conjunctivitis and may work into the deeper parts of the eye. That disease has been already referred to above, so that no further description is needed here.

The most serious effect of the inflammation is in the cornea, because there the slightest ulceration may result in a scar, and a scar, if it is in the middle of the eye opposite the pupil, means blindness. If the scar happens to be on the lower segment, or on the upper segment, or to one side, it will be unsightly, but have no effect on vision. But if it happens to be in the middle, even if a very small scar, it makes a very serious impairment of vision. In all asylums and schools for the blind there are many children who can see partially, including many whose corneal scars are such as do not completely shut out vision. The problem of the blind includes the problem of the partially seeing.

When we get smoke or cinders or any foreign body in our eyes a little conjunctivitis is excited — the red discoloration that we are familiar with; it has no special importance.

The cornea being such a delicate membrane, so easily broken, so easily wounded, it is rather extraordinary, it seems to me, that so many of us get through life with sound eyes. It is more comprehensible if we notice how quickly the eye defends itself by the quick winking reflex. The winking reflex acts far more quickly and more accurately than we could make it go by will. Moreover, if we shut the eye very tight and frown at the same time, we notice that there is a big cushion of fat over the eyeball defending the eye against any blow which the bones of the orbit do not care for. The eye will stand a good deal in the way of blows because of the winking reflex, the cushion of fat, and the bones around it.

When a man gets a black eye, he has usually received a blow which falls chiefly upon the bones, but somewhat upon the eyelids. If just a drop or two of blood is poured out there, it spreads very quickly and gives the familiar "black and blue" appearance. Another result of that very loose structure of the eyelids is that any inflammation of the skin, such as ivy poison or erysipelas, if it happens to come near the eye, will close the eye at once by puffing up the loose tissues. An inflammation which would not amount to anything on the finger, if it happens to be near the eye, will make a

most alarming though harmless swelling. I was called the other day to see a lady who thought she was going to die because a hair wash she had put on the night before had irritated the scalp and the irritation spreading to the skin about the eyes had closed them tight. It takes a very slight inflammation to do that.

In spite of the protection that I have spoken of, the cornea gets broken by flying splinters It heals very quickly, but it heals with a scar. Bits of steel flying off from a machine or from the rail of the elevated cars will stick in the cornea and often cause a scar. If the fragment is dirty a serious sepsis may be set a-going.

Interstitial keratitis is becoming a problem for social workers of late years, largely through the interest of Dr. Abner Post in congenital syphilis. Interstitial keratitis produces the dull, steamy, opaque front to the eye which we see in congenital syphilitic children. Much is accomplished for vision in favorable cases by anti-syphilitic treatment. As a rule this disease does not destroy vision; it merely makes it hazy.

Phlyctenular conjunctivitis and keratitis, starting in the conjunctiva and getting into the cornea, is a disease that is becoming very much more definitely placed as a result of tuberculosis in the last three or four years. It used to be said that it came in "scrofulous" children or people living under bad conditions, but I think that those who study it most now say that it is a result of tuberculosis — probably not a form of tuberculosis itself, but bound up with it, an offshoot or by-

product of it. The disease starts in the conjunctiva, beside the iris, as a little red or yellowish patch, and then works inward toward the centre, finally on to the cornea, where it makes a little gray point about as big as a pin-head, the *phlyctenule*, which gives the trouble its name. From the social point of view, the important thing is that these children should be treated as if we knew they had tuberculosis elsewhere, which in all probability they have, in their bronchial lymphatic glands or some other inaccessible place. A great deal can be done for the relief of these children by fighting their tuberculosis through the methods which we are all now familiar with. Local treatment is not as a rule much emphasized now. Fresh air and food and rest are just as good for the eye as they are for the lungs, and may help to ward off partial blindness — the effect of corneal ulceration in severe, neglected cases.

The iris itself has its inflammations or types of *iritis*, which are most commonly *streptococcic*, what we used to call *rheumatic iritis*. Two years ago we had a big milk epidemic of streptococcus disease starting in Cambridge. We had at the Massachusetts General Hospital a great many cases with joint and heart trouble and *iritis* — all three starting from the streptococcus, from "rheumatism" as it would have been called formerly. That is the commonest, the mildest type of iritis. It gets well ordinarily in two or three weeks and is not followed by external scars.

Syphilis is the commonest cause of iritis. It has much

more serious results because of the more serious character of the infection; tuberculosis much more rarely. "Rheumatism" and syphilis produce the two commonest and best known types of iritis. One of the diagnostic points is that the red which we see in any of these inflammations of the iris forms a ring close around the iris instead of being spread over the whole white of the eye. In pink-eye, a conjunctivitis, the whole eye is pink.

Iritis is a thing that the ophthalmologists are always much interested in, because there is something that they can do for it. The iris lies very close to the lens. When the pupil is small the iris touches the lens. Hence inflammations of the iris are very apt to produce adhesions, which bind the pupil to the lens, and make it impossible for the pupil to enlarge. We all know how the pupil shuts down when we face a strong light, and opens up when we are in the dark. That movement is abolished when an iritis has not been treated and when adhesions have occurred, binding it to the lens. These adhesions can be prevented by giving atropin, which keeps the pupil big, paralyzes the ciliary muscle, so that the iris is kept away from the lens and does not stick to it. This atropin paralysis of the iris is kept up until the attack of iritis has passed by. Besides this, general constitutional or hygienic treatment is all that is to be done in the rheumatic form. In the syphilitic, of course, anti-syphilitic medicines are used.

The lens itself is subject to practically only one set of

diseases, which go by the name of *cataract*. The one disaster that happens to the lens is that it gets opaque. What is called "senile cataract," or "hard cataract," is the commonest type. There is also the soft cataract such as diabetics get (the so-called "diabetic cataract"), and finally, the *congenital cataract* of young children — three types.

Senile cataract is the one in which, on the whole, the most brilliant results that I have seen have been secured. With a very thin knife the surgeon cuts through the edge of the cornea at the point where there is no harm in making a scar, cuts out a bit of the iris, cuts the muscles holding the lens, and takes it out. That seems radical, but by putting a glass lens in a pair of glasses in front of the eye, a person who has been practically blind before is sometimes able to see even fine print, a perfectly marvellous transformation. The operation is done under cocaine, without any pain, so that the patient does not have all the discomforts of a general anæsthetic, like ether.

The soft cataract, the diabetic, is not so easily dealt with, because of the more serious nature of the underlying disease. Diabetics do not bear surgery of any kind very well; it is hard to get their tissues into good condition.

Of the causes of congenital cataract little is known. At the Massachusetts Eye and Ear Infirmary they are particularly interested from the social point of view, because these children can be helped a good deal if

they will come in every two or three months for the slight operation called "needling." They are very anxious at the Eye and Ear Infirmary to have somebody devote his time to getting these children in as often as they ought to come for this purpose.

Questions and Answers

Q. What causes cataract?

A. I don't think any one knows. We know that the tendency all over the body in old age is to get hard. Our cartilages, our joints, our kidneys, our hearts, everything stiffens up, and the sort of tissue that cataract forms in the lens is like the tissue which is formed everywhere in the bodies of elderly people.

Q. If a person has cataract in one eye, is he bound to have it in the other?

A. He is very likely to have it in both eyes, first one and then the other.

Q. What is the cause of the congenital form?

A. I do not know. It is not syphilitic apparently. I do not know what the cause is.

We have been going backwards — conjunctiva, cornea, iris, lens. We have come now to the vitreous humor, in which, as I have said, there are no important diseases; next comes the retina.

The retina has important diseases, especially a complication of diseases in the heart and kidney. In diseases of the heart and kidney there occur changes in the retina, which may hurt vision badly. Quite often a patient has had trouble with sight and is referred to a hospital for treatment of the heart or kidney, a trouble

which has first been found by looking at the eye. In looking into the back of the eye, we are looking into the interior of the body in quite an extraordinary way. We can see arteries and veins, and even very slight arteriosclerosis can be detected in the arteries of the eye when we cannot find it out anywhere else. The other day in a series of examinations of supposedly healthy people, Dr. George Derby came across a person of thirty-nine in whose eyes he saw arteriosclerosis. That is young for arteriosclerosis, and when he came to question this patient he found that his mother had died of premature arteriosclerosis at about that age, so that there was apparently an inherited tendency to arterial disease. In Bright's disease the retinal changes are mostly hemorrhages and their results; little hemorrhages at the back of the eye show by a little red spot, and then, as this is absorbed, a white spot against a red background. Such hemorrhages hurt vision much or little according to their size and position. We have no treatment for them.

The two eyeballs are like apples on the ends of two crossed sticks. The two sticks are the optic nerves. These optic nerves, as they come into the retina at the back of the eye, can be seen with the ophthalmoscope. It is the only place where we can look at a nerve bare, uncovered by anything. Very early disease in the optic nerves, *neuritis*, can be seen there face to face, as it were.

The commonest type of neuritis accompanies tumors

of the brain. In people suffering from very severe headaches sometimes the whole question of diagnosis may depend on what the ophthalmologist sees as he looks at the end of the nerve.

Optic atrophy is a very familiar result in tabes dorsalis (locomotor ataxia). Many a case of blindness which turns up at an eye and ear hospital is nothing but tabes, showing itself in that particular nerve, as well as in its ramifications farther back toward the spinal cord. We have already said that these nerves cross. That is true of almost all the nerves in the body. The right side of the brain corresponds to the left arm and leg. If a person has a paralysis of the right arm and leg, we can usually be sure that there is trouble on the left side of the brain.

There is no treatment for atrophy of the optic nerve. For early optic neuritis we can do something in case the cause (tumor, hemorrhage, syphilis) can be removed.

I have said nothing yet about eye muscles. The best way to think of the muscles of the eye is to think of the way a horse's head is harnessed. We have a rein at each side that will pull his head to the right or left, a check-rein over the top to pull his head up, and a martingale to pull his head down. If we think of ourselves as behind the globe of the eye, driving, we have these four muscle-bands by pulling on which we could turn the eye up or down or right or left. That is where we would naturally suppose Nature would stop, but like

everything else in Nature the eye does not fit into an orderly plan. There are two extra reins, six muscles hitched to the eye, instead of four. The four would do all the work. What we have six for I have not the slightest idea. I do not know of a better example of the fact that Nature never does what we think she is going to do.

The importance of those muscles in disease is that they may produce *squints and headaches*. When one muscle is a little shorter than the others and tends to pull the eye over, we have one type of eye-strain. If a muscle is very much too short, the eye squints. The squints are inconvenient and disfiguring. Probably we have all seen some very extraordinary operations whereby a person with quite crooked eyes has had his eyes put straight by cutting the eye muscles.

The subject of troubles in muscular balance, when one muscle is a little too short, but not enough to make a squint, brings us to the general subject of eye-headaches, of which pretty much everybody has some experience. Eye-strain as a cause of eye-headaches is due partly to this trouble which I have just spoken of, but much more often to *astigmatism*. *Astigmatism* means that in the front of the eye, the cornea, which ought to be a perfect globe, there is one of the curves across the eye, or more than one, which is not a perfect segment of a circle. It is too flat or not flat enough. In a perfect eye all the curves are alike, but in most people's eyes they are not; in some one direction as we go

across, either up or down or transversely, the curve is not perfect. I suppose that this is the commonest of all eye troubles, and the commonest of all causes of ocular headaches. I believe that ocular disease as a cause of headache is less thought of than it was ten years ago. In Boston, perhaps, fewer headaches are called ocular headaches than in some other cities. Of course I am referring to the different views of different eye specialists. The specialists here, I think, are less prone to prescribe glasses than those in other cities.

Near-sightedness and *far-sightedness* are due to defects in the shape of the eye. The near-sighted eye is too long from before backwards; *myopia* is the technical term for that, and *hypermetropia* the term for far-sightedness, such as old people generally have. Those three diseases — *astigmatism*, *myopia*, and *hypermetropia* — are the troubles for which glasses are generally fitted. They form a class of work by themselves and are called *errors of refraction*. In hospitals the man who works to correct these errors often does nothing else, and in many hospitals the refractionist is paid. The optometrist is the gentleman who thinks he can learn this part of the eye without learning the rest. For many years there was a contest in the Massachusetts Legislature as to whether the optometrist ought to be registered and licensed to practice. The ophthalmologists contend that we cannot safely fit people with glasses without a good knowledge of the rest of the eye and its diseases.

A rather mysterious disease of the eye, *glaucoma*, means that the fluids inside the eye are pressing too hard to get out. It involves an increase of tension within the eye, comparable to high blood pressure in the arteries, although it has no connection with that. Glaucoma may produce headaches or may produce no symptoms whatever. Sometimes it is discovered just as part of a routine examination by eye specialists. It is a very serious disease, for it often leads to blindness, but luckily a rare one. On account of this disease especially the eye specialists are coming to feel that the eye should be examined, as a matter of routine, once in so often, because glaucoma may come on without any symptoms whatever.

Last year a group of physicians examined, as a matter of precaution, one hundred supposedly healthy members of the Boston Economic Club, among them one gentleman with perfectly good eyesight and no headaches; so far as he knew he was perfectly sound in every respect. He was found by our group-oculist to have glaucoma, and in a stage in which operation could make a great difference in saving his eyesight. He has had the operation since. This case made a great impression on all of us who examined that group of men; it certainly exemplified the value of routine group-examinations.

Q. What about the acute form of glaucoma?

A. That is more likely to be recognized. It causes headaches and vomiting and halos or rainbows about any bright

light. It is more difficult to stop, as I understand it, than the chronic type, but less likely to lead to the tragedy of being overlooked until it is too late. Nobody knows the cause of glaucoma.

Trachoma, a disease that twenty years ago was practically unknown here, is now pretty common both on the eastern coast and among the American Indians, in many parts of the Blue Ridge country in Kentucky and Tennessee, and in other sections of country cut off from the world. Trachoma is a contagious disease, although we do not know the germ. It is contagious from person to person and very difficult to cure, though not impossible. It is a disease that we don't often see in the streets now, because so many people's attention has been attracted to it and patients are hustled away for treatment. The appearance that we may see is the granulated lids, or little elevations, red mounds on the inner surface of the eyelids, which make them look very red and turn out, and give the person a look of great misery, even though there is not much suffering to the disease. It does not generally cause blindness, but in old, neglected cases it may do so. Starting in the lids and being confined to them for a long time, if it is not treated it may get on to the eyeball itself and so be serious. Direct surgical treatment of the eyelids can do a great deal to check or to alleviate it.

Toxic amblyopia means partial or total blindness without any known lesion of the eye to explain it.

Poisoning of the tissues is the cause. The poisons of uremia, diabetic acidosis, malaria, also tobacco, alcohol, and lead, besides quinine, arsenic, and methyl alcohol are responsible. Most cases recover when the poison is out of the system.

Diseases of the Ear

I have been very much impressed, in looking up the eye and ear statistics at the Massachusetts Eye and Ear Infirmary, to find that diseases of the ear are prac-

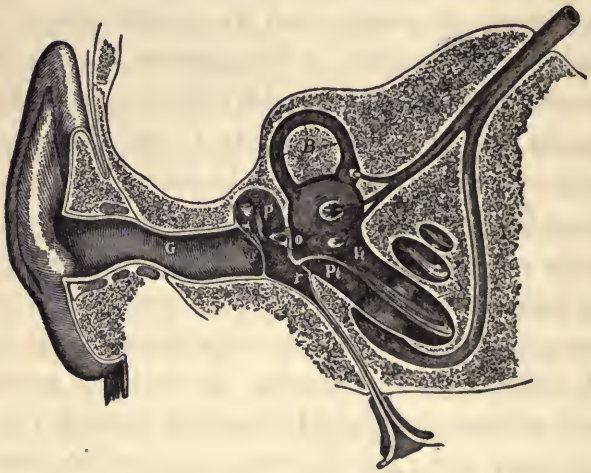


Fig. 31. — Semidiagrammatic section through the right ear (*Czermak*): *G*, External auditory meatus; *T*, membrana tympani; *P*, tympanic cavity; *o*, fenestra ovalis; *r*, fenestra rotunda; *B*, semicircular canal; *S*, cochlea; *Vt*, scala vestibuli; *Pt*, scala tympani; *E*, Eustachian tube.

tically all one disease — *otitis media*. That, with its various complications, is *the* ordinary child's ear disease. Wax, of course, comes well up in the list, but it

is hard to take that for a disease. The following are the statistics of the diseases most often seen both in the wards ("House") and in the Out-Patient Department (O. P. D.) of this hospital: —

	House	*O. P. D.*	*Total*
Otitis media	619	1640+	2259+
Otosclerosis	2	20	22
Labyrinthitis	4	45	49
Wax		1560	1560
Eczema		132	132

The passage that leads into the ear from the outside comes to an end in a flat membrane which we call the "drum." It is in this passage that wax accumulates. From the inner side of the drum there comes a tube (the Eustachian tube) leading directly from the throat to the middle ear. This cavity, which we call the "middle ear," is thus entered from two sides, (*a*) the outside passage normally blocked by the drum membrane, and (*b*) the passage from the throat through the Eustachian tube which is open and has no membrane to close it. Through this, the middle ear, where most ear troubles arise, is often infected from the throat. The ear (i.e., the tube) gets "stopped up." "Catarrhal deafness" is the term used for disease of the ear which results from a cold or catarrhal inflammation travelling up the Eustachian tube. In that cavity of the middle ear there are a great number of mysterious things which after hundreds of years of study are still mys-

terious. There are three sets of objects: (1) A set of bones smaller than the little finger nail (one like a horse's stirrup and called the "stirrup bone," another shaped like a mallet). These minute bones hitch on to the drum on its inner side and communicate its vibrations to the auditory canal, and to the nerve leading to the brain. We hear with our brains, as we see with our brains, through a nerve. (2) The organ of balance (or the semicircular canals) which for some reason or other is put in here. It has nothing to do with hearing. Then (3) there is the hearing apparatus itself, which seems to be a thing more or less like a grand piano with strings of different lengths, corresponding to the different tones which we hear.

Practically the only aural disease that laymen have to know about is *otitis media*, or disease of the middle ear, which gets in from the throat and breaks through the drum, either spontaneously or with the aid of the surgeon's knife. The most important help we can give is to puncture the drum. This is a delicate operation, — the ordinary physician is not able to do it well, — delicate because the drum is hard to see, because it is hard to manipulate the knife correctly, and because the operation is very painful. It is all over in a second and people are apt not to etherize a child, but this is a mistake. It is the sort of job which a child never forgets, and it makes him hostile to all the world which circles around a doctor's office.

Otitis media is a suppuration or inflammation, mild

or severe, acute or chronic, which is spread to the ear, as I have said, chiefly from the throat. It may also be the result of tuberculosis or of other germs. The bacillus of influenza, or of typhoid, can get up the Eustachian tube and produce otitis media. We have stopped this for the most part in typhoid by cleaning the patient's mouth every three hours; that is one of the chief duties of nurses in typhoid.

Besides its great frequency in children, and besides the fact that the most important thing to do is to puncture the drum, the other fact which laymen should know is that this inflammation can very easily perforate through the wall on the inside of the ear and get into the mastoid bone, which is of itself of importance because it is so near the brain. Cases of otitis media may not only spread into the mastoid, which cannot be prevented, but may reach the brain and cause serious, often fatal, meningitis. By opening into the mastoid bone we can make the pus drain out instead of going into the brain. Thus we may prevent meningitis. It is a delicate operation.

There are three common procedures done by the ear specialist: he punctures the drum, he chisels open the mastoid bone, and he inflates the middle ear. This last is a procedure for opening the Eustachian tube. The patient is given a glass of water to drink. Just as he swallows the doctor blows air forcibly up the nostril. The air goes in through the Eustachian tube and opens it up, relieves that wooden, stopped-up feeling that

we often have from a cold, and lets air (which is very necessary) into the middle ear back of the drum.

Q. Can the drum be shattered by a loud noise?

A. I do not see why not. I have heard of it. In dealing with caisson disease I mentioned the group of cases which we have seen at the Massachusetts General Hospital this year, broken ear drum from air pressure. I do not see why it should not happen from tremendous sound. The drum usually mends itself with extraordinarily little damage to hearing. Of course the drum is not the organ of hearing. Its use is mostly to keep the outside world out. Scars of healed wounds in the drum ordinarily do not interfere with hearing.

The *causes of deafness* are in two main groups: (1) Trouble in the sound-conducting apparatus (wax, and otitis media, blocked Eustachian tube). (2) Trouble in the labyrinth or in the nerve leading to the brain. In the labyrinth syphilis is the commonest cause of deafness in young people and hemorrhage in old people as part of arteriosclerosis.

There is another form of ear trouble which is congenital, very apt to be inherited from one generation to another, especially if two deaf people of this particular type marry each other. Ordinary deafness acquired from causes such as I have mentioned is not inherited, but people who are congenitally deaf, the congenital deaf mutes, if they marry are very apt to have deaf children. Some part of the machinery of hearing is absent, blocked or malformed. In some States there is a law against the marriage of such persons.

CHAPTER XIX

EMERGENCIES — HOME MEDICINE — PERSONAL HYGIENE

Emergencies, and the Methods of Dealing with them

CHOKING is perhaps one of the commonest emergencies encountered, especially with children. Most of us have seen more or less mild cases of it, but it may be a very serious matter. Children have died from getting an unchewed mass of meat into the windpipe, and at any moment what seems like a laughable matter may become crucial. The familiar remedy — slapping on the back — really does good, because it stimulates coughing, and if the child can cough he is more likely to expel whatever has got stuck. If that does not do it, and the child goes on to get black in the face, there is every reason to hurry and do the only thing we can do, which is to put the finger down the throat and get the thing out. We must take time enough, however, and be careful not to push the mass farther down. Of course, if we had a pair of pincers or forceps, that would be the best thing; but if the child is fairly small and our fingers are fairly long, we can generally get around whatever there is and hook it out. The child will die within a minute or two if there is complete obstruction. Generally the child does not undertake

to swallow anything as big as this, and so can cough a few times and get it out. Holding him upside down is a method intermediate in value between slapping on the back and trying to hook the matter out.

Q. If it happens to be in the pharynx instead of the windpipe, can't you push it down?

A. Yes; but it is hard to be sure that you are not poking it into the windpipe.

In putting the hand into anybody's mouth, it is well to know how to prevent one's self from being bitten. There is one traditional and perfectly sure way to prevent it — to put the finger on the outside of the cheek and press the soft part of the cheek in between the person's jaws. Then, when he bites he bites his cheek and so stops. That is constantly done in dealing with struggling or unconscious patients.

Control of bleeding. I advise against trying to put on a tourniquet; that is, putting a bandage above the bleeding point on the leg or arm and twisting until we make it tight enough to close the arteries and so to stop bleeding. The ordinary statement is that bleeding is either from a vein or an artery, and that if it is from a vein you do not need to put on a tourniquet, but if from an artery you do. That is a mistake. In my opinion it is not a good thing to try to put on a tourniquet. We can either stop the bleeding in other ways or if we can't we are likely to do as much harm as good in our attempts. The best way to stop bleeding is by the application of gauze and pressure. The mesh of the

gauze is what we need, and any mesh will do. Mosquito netting will do. The old-fashioned habit of using cobwebs was dirty but effective. Stuffing gauze right into the wound and pressing hard will stop practically any hemorrhage that one can stop at all. Following this rule avoids the chances of doing more harm than the hemorrhage itself will do. Anybody who has seen many operations knows that very serious hemorrhages happen and are controlled by gauze and pressure without any attempt to do anything else. What the doctor calls "gauze" is ordinary cheese cloth sterilized by baking.

The one thing most important to have as a household remedy is sterilized gauze, gauze that we do not have to stop and question the cleanliness of.

We should not try to make the distinction between arterial and venous hemorrhages. Arterial blood comes in jets instead of flowing steadily, as venous or capillary blood does; but as both are to be treated alike so far as the layman is concerned, their difference is not important.

The pressure is just as important as the gauze. I once was up in the woods with another man and an axe quite far off from any help. The other man cut his foot badly with the axe. There was no gauze and no possibility of any help. I took hold of the sides of the cut and pressed them together as hard as I could. Bleeding stopped at once. I still held it, and within an hour it no longer needed to be held. It would have stopped

quicker if we had had gauze, but the pressure was enough to do it.

When the hemorrhage has stopped, what shall we do with the gauze? Better leave it there until the doctor comes. It won't do any harm to leave clean gauze in a wound for even twenty-four hours. This applies to every sort of bleeding — to very severe nose-bleeds, to bleeding after a tooth is extracted, or from cuts or wounds of any kind. The whole matter, then, is very much simplified if one does not have to go into the technique of trying to stop bleeding by pressing on the artery above the point, as most treatises say.

I suppose the bleeding we see most often is a nose-bleed, and the reason it makes difficulty is that we do precisely the wrong thing — bend forward over a basin. That position compresses the veins at the base of your neck, and keeps more blood in the head, so that bleeding is kept up. The person should lie down on his back. A certain amount of blood will go down into the stomach, but that does no harm. In the majority of cases the bleeding will stop by lying down and keeping quiet. Otherwise it has to be stopped in the way I have said, by pressure and gauze — stuffing gauze up the nostril, putting it into place with a pencil. We make a long strip like a tape, put one end in and keep packing more and more up until we have filled the nostril tight. In the vast majority of cases that will stop it.

We have, I suppose, seen people drink salt and water

or put cold doorkeys on the back of the neck, etc. They do no harm at all, and are perfectly good ways to kill time if we have nothing else to do.

Q. If we have not any sterile gauze, can we use anything that is clean to stop hemorrhage?

A. Use anything that is clean or anything that is not clean. Sterile gauze first; next to that anything that is clean; next to that anything that is not clean. In a bleeding wound the current is away from the body and the germs will usually be pushed out. The gauze is a great deal better than any other material because of its mesh. Cotton or linen or anything else than gauze does not work nearly as well.

Hemorrhage from the lungs, bleeding from the lungs, is a very alarming thing, sometimes, to see. The first thing to remember is that practically no one ever died from hemorrhage of the lungs. It looks more serious than it is. It is a symptom of pulmonary tuberculosis, but is practically never fatal. As a rule the patient is not any worse than he was before. There is nothing the layman can do about it. There is practically nothing that a doctor can do about it, and as a rule he does nothing but tell people that they need not be alarmed. The trouble often is made worse because people fly around and try to do or to think of something to do. This agitates the patient and aggravates the hemorrhage. Keeping as quiet as we can is the main thing that makes a difference.

The same thing is true of the *vomiting of blood* — practically never fatal and not to be stopped by any

measure that is known. It will stop itself. We know no medicine and we know no method of stopping hemorrhage from the stomach. There is a certain amount of comfort in being sure that, while we cannot do anything, no one else can do any more.

Bleeding from the bowel is very common in connection with hemorrhoids, and as a rule does no harm. Once in a great while we see a person who loses enough blood to get anemic and exhausted. That is a very small minority of cases. The patient is apt to think that the amount of blood is much larger than it is, because it gets mixed with water and it is hard to tell how much it is. But there is no need in nine hundred and ninety-nine out of a thousand cases of being in the least troubled about it.

Perhaps this is a good place to write something about *hemorrhoids.* Hemorrhoids are practically always the result of constipation, and will not stop usually until the constipation stops. Efficient treatment of constipation will often stop hemorrhoids. Aside from the treatment of constipation, the other important thing is to keep them inside the body instead of outside. The hemorrhoid is a dilated or plugged vein of the same nature as the varicose vein on the leg. When it stays outside the body, it very easily gets irritated and painful and may suppurate. But although people are very apt to think they cannot keep a hemorrhoid back inside the bowel, they practically always can and practically always must. If they do that and also at-

tend to the matter of constipation, as a rule nothing else is needed as treatment. If those means do not help, there are ointments to be obtained from any physician which will help somewhat, and if those do not help operation is a last resort. But it is not always successful. That is, if the same cause that produces the hemorrhoids in the first place persists — constipation — the hemorrhoids will come back again, no matter how thoroughly they are operated on the first time. Piles are not a serious matter, then, in nine hundred and ninety-nine cases out of a thousand, and not a matter needing operation if the simpler methods are attended to.

Cuts. We do not need to sew up a cut; presumably we should not expect to; but I have seen conscientious people who thought they should make an attempt to sew up a cut if the doctor was not at hand. The worst that can happen is that the scar will be a little larger than if it were sewn up at once. A cut sewn up very promptly and very skilfully leaves a smaller, narrower scar. If it is not sewn up at all, the gash fills up from the bottom, and makes a wider scar, but is just as satisfactory a healing in the end.

Bruises, it seems to me, should not be treated at all. It is not incumbent upon us to try to think of any treatment because it does not do any good. I do not suppose many of us can remember the days of vinegar and brown paper. I can remember vinegar and brown paper being put on bruises.

Sprains, and possible fractures. The essential thing for laymen is to do nothing at all. If we have to move the person, as we often do, the best thing is, I think, something I have already mentioned — to put the arm or the leg lengthwise on a pillow, fold the sides of the pillow over, and pin them with safety pins across the top. That makes a very useful splint. One can take up the pillow very handily and one does not hurt the person to any extent. Nobody who is conscientious is certain about the diagnosis of a sprain unless there has been an X-ray. All that any of us, even physicians, do nowadays with a questionable bad sprain or fracture is to get it temporarily done up and take it to an X-ray machine.

Loose cartilages in the knee-joint, little edges or bits of the cartilage or of the joint membrane, get floating about in the knee-joint. Now and then they get pinched between the bones, the upper and lower millstones in the joint, and the person has a sudden catch in the knee and a sudden pain. He slips on the floor, or in football or in tennis has a sudden sense that something is very wrong in the knee. In the great majority of cases that is a "loose cartilage" caught, as I have said, and it can be relieved by this manœuvre. Bend the knee up as far as it will go and then straighten it out. Drawing the knee up opens the joint on one side, and allows the cartilage to get out; then straightening it out opens the other side, and if the loose body does not get out the first time, it may the second. Gen-

erally, when we do this the patient feels something slip, and the whole thing is relieved.

Unconsciousness, whether from being stunned by a blow, or from fainting, needs no treatment. One must repeat a great many times, even to social workers, that there is no danger of people dying for want of attention under these conditions. We may hurry them back to consciousness, but if we do not they will come back just the same, and there is no need of doing anything at all. The public is very much afraid and insists on the fact that So-and-So, their friend, had a doctor "work over him for hours." That is no doubt true, but in most cases the patient would have "come round" just the same if nothing had been done. *Fainting* does not mean anything wrong in the person. Especially it does not mean heart disease. People with heart disease very seldom faint. It is safe for them when the faint is over to get up and go about their business.

In *fits*, again, we are safe in doing nothing. Nobody can stop a fit or cure it, and in almost every case the person comes out of it without any permanent damage. There are little things to do, which I think I have already mentioned, such as putting cloth or something between the jaws so that he will not bite his tongue. But even if we fail to do those things it does not make any special difference. The worst that can happen is that the patient will have a sore tongue the next day.

Convulsions in children are very much less serious as to their ultimate significance than in adults. A child often has convulsions for slight reasons connected with his digestion or his teeth, and gets over them and is perfectly well for the rest of his life. The one thing that we can safely do is to put the child into a hot bath. The heat does shorten convulsions in some cases. If it does not, there is nothing else to do.

In contrast with all these things, there is one disease in which what we do makes the greatest difference and must be done at once; that is *sunstroke*. It was an old by-word in the Massachusetts General Hospital that if one heard the medical officer running there must be a sunstroke case in the accident room. That expresses what I mean — that this is one of the few emergencies where to do the right thing and to do it at once may save a life. Of course the right thing at first is to be sure what disease the patient has, but this diagnosis depends wholly upon two facts — the conditions under which the patient became unconscious and the temperature as found by thermometer. If a person who has been working in the sun, and has been perfectly well up to that time, falls unconscious on a very hot day, especially with a high humidity, and if his temperature is found to be 106° or more, the diagnosis is so near certain that we should act as if it were certain. The temperatures in sunstroke are often higher than 106°, — 108°, 112°, — I have seen 115°. It is very seldom less than 106° when the patient is unconscious.

There is nothing else characteristic; the patient is deeply unconscious and that is all.

The treatment, of course, is to bring the temperature down, for the body cannot stand that temperature for long, — and the way to do that is to use ice. The patient should be stripped and rubbed with ice. Ordinarily two people work over him, each with a block of ice; one rubs the upper part of the body and the other the lower half, first back, then front. We keep taking the temperature in the rectum while we are doing this, and when the temperature gets to about 101° we stop the ice, for the cooling process keeps on after we have ceased applying the ice and may go too far. We generally keep a cold towel or ice-bag on his head as well while icing the body. That is all. Drugs and other methods of treatment are bad.

We can do the same thing by putting the person into a cold bath, but any one who has dealt with an unconscious adult in a bath knows that there are considerable embarrassments about it; we do not want to drown him.

He generally recovers consciousness within twenty or thirty minutes, and as a rule is well within a day or two. There are generally no permanent ill effects. The people that we hear of who have been sick ever since they had a sunstroke are generally people who had something else. One of the curious things about sunstroke is that it does not happen in many of the hottest places in the arid States of this country, where they

have temperatures such as we never have in the East, but without our high humidity. I was in Arizona when the thermometer was at 120°, but the doctors of the State told me that nobody ever had a sunstroke in Arizona, and I believe that is true. People with sunstroke faint right away. It is very quick as a rule; a man will be at work at twelve o'clock, and at two minutes past twelve he will be unconscious. He may have a little headache before it comes, but generally not enough to make him stop work.

Quite different is *heat exhaustion*. Heat exhaustion comes to people working indoors out of the sun — engineers, firemen. The patient is not unconscious. (The sunstroke patient is always unconscious.) He is not hot; the surface of the body is cool; the thermometer shows that he has no fever. He is very weak and may die, though he generally does not, but he does not look at all like a sunstroke patient and does not behave like one. Heat exhaustion is a form of cardiac failure due to heat and to the conditions of work. These people need simply to be taken out of the heat and kept quiet; they do not need any ice or anything else.

Burns can be treated, if we have the material at hand, so as to make them almost painless. When I was working in a chemical laboratory once, I spilled boiling sulphuric acid on my wrist. When cold it will burn the skin; when boiling it burns very rapidly. I happened to be close to a faucet. I put the wrist under the water, feeling no pain, and kept it there until somebody found

the next thing; which is bicarbonate of soda. I plastered that on and never had any pain at all, although it was quite a deep burn. Get the burnt part under water, in the first place, to keep the air off; then get it into alkali which should be plastered on and covered with a moist rag to keep it in position. When a burn has been exposed to the air for some time before we get these remedies on, they do not do so much good. The quicker we can get them on, the more relief from pain. Later a burn is usually dressed with some ointment in order to exclude air and yet prevent the dressings from sticking.

The effects of cold, *frost bite*, can be passed over very quickly. If a person freezes his ear or freezes his cheek, the whole point is not to allow it to be warmed too quickly. The blood is all driven out, and if the full rush of blood goes back, the tissues may die; so that we try to warm the part up slowly. We have all heard about rubbing the part with snow. Of course, we cannot rub it with snow for more than a minute without its getting warmer. A cloth, with what we should ordinarily call cold water, put over the frozen ear or cheek of a person in a fairly warm room, will keep the part from getting warm too quickly. That carries out the same idea as rubbing it with snow, and in a little more rational form.

Poisoning with something taken into the stomach. The first aid is to empty the stomach, and the easiest way to empty the stomach is to put a couple of heaping

teaspoonfuls of mustard into a glass of water and get the patient to swallow it. If we cannot get that, merely large draughts of lukewarm water will make a good many people vomit, and if it does not it will dilute the poison, which is all good so far as it goes. That is about as much as it is worth while to try to remember. The one thing that will perhaps stay in our minds is the acid-alkali contrast. If the person has taken acid we give him an alkali. Alkali is soda; acid is vinegar or lemon juice. If he has taken alkali, he can be helped to some extent by pouring down a weak acid on top. Emptying the stomach is a safe and proper thing for anybody to do.

I can remember being told all sorts of things about what we ought to do for *snake poison*, but I should advise laymen not to try to remember anything about it. The chances are we shall never see it.

Drowning. There are a good many things to be done here, and it is important to do them. The best way to remember them, I think, is to have a clear idea of what it is we are trying to remedy. A person who is near to drowning is a person who has got water into his lungs — taken water into the lungs down his windpipe, and who has stopped breathing. Those are the two essential facts. We never should fail to attempt resuscitation, no matter how dead he seems.

It is quite easy to see what we ought to do and if we have somebody to help us it is quite easy to do. Stand the person on his head. As a rule there is more than

one person at hand, and two people can lift the body up and hold it head downwards. That is all that is necessary as a rule in order to get the water out. Sometimes we put the patient across a bed or a table, with his head hanging down, which is nearly as effective as the other position and much easier.

Get the water out. That is the first thing which has to be done. The remaining things are both to be done at once. One is to get the patient's body warm, for it is very cold; and the other is to make him breathe. We take off his clothes and get hot blankets next to his skin if we can. That makes a difference, although it is not the main thing.

Q. If you do not get the water out, how long do you want to keep him in the inverted position?

A. The water, or all that we get out will run out of his mouth at once — there is nothing to keep it in if he is upside down.

Q. Is it any use to roll a patient on a barrel?

A. The idea of that is that if the patient is lying face downward across a barrel, with his legs on one side of it and his head on the other, he will be in the right position for the water to run out of his lungs. A fence, a table, a bed, will do just as well.

There remains the essential treatment which is called "artificial breathing." What opens a person's chest and what closes it? We wish mechanically to pull the chest open as it is opened by a deep breath. We have two convenient handles, the arms, by means of which we can pull open his chest. The easiest way, it

seems to me, if we are alone, is to have the person lying on his back on the floor or ground, then stand at his head, get hold of his arms, and pull them up above his head until the elbows nearly meet. That opens the chest. The arms are joined to the chest so that we cannot pull them up without opening the chest.

As soon as we have got the arms up, we put them down again and then lean on the chest pressing its sides down and in so as to push the air out of it. We do this about as often as we breathe ourselves (eighteen to the minute is the average). That rhythm must be kept up until the patient begins to breathe himself,—for hours if necessary. There are well-recorded cases where the patient has not breathed of himself until after an hour of continuous pumping of the kind described. What we hope is that after we have done artificial respiration for a few minutes the patient will start and breathe himself. But he often does not for a long time, and we should never give up for at least an hour.

It is best not to try to find out whether the heart has stopped or not. We are doing the best we can by carrying out artificial respiration and keeping the patient warm, after we have got the water out of his lungs. There are various ways of doing artificial respiration, but I think if we master this one it will be sufficient.

Bee sting. We all know the traditional advice, to put some mud on it. I suppose the reason mud is ad-

vised is that mud is often alkaline and pretty nearly all bee stings are acid — but it does not seem to me personally that it makes a great deal of difference what we do.

Q. How can we tell a faint from a heart failure?

A. We cannot. We have to have a doctor for that. In the vast majority of cases the patient will come to in a short time, and then we know. The other thing to remember is that people with heart failure do not generally become unconscious, but usually breathe very hard like a person at the end of a race. If it happened that a person became unconscious from heart disease, no one but a doctor could tell it.

Home Medicine

People used to have good, well-stocked medicine closets at home, but one of the best signs of the time, I think, is that medicine closets are disappearing. Gauze is a very essential thing to have. But we do not need to have brandy, for instance, or whiskey, or any "stimulant" at hand. There is no occasion for those drinks in medicine. Any one who needs a stimulant had better have coffee, or hot milk, or hot soup. I do not really know a single medicine that I think is necessary to keep in stock in a house.

Personal Hygiene

Sleep. Sleep all that you can. You cannot overdo it and should go to bed early enough to have slept your sleep out and prefer to get up when your natural time for rising comes. There is no fixed dose of sleep for all

persons. Children need most, old people least. Each individual should find out his own proper allowance and get it regularly, or if anything shortens it, make up what is lost. Few adults need less than eight hours. Many need nine or ten.

The air of the sleeping-room should feel distinctly *cool* and should be *in motion*. Have the bed near enough to the window and the window (or windows) open enough to accomplish these two objects. In summer cool, moving air can often be best attained by sleeping outdoors. In winter the same conditions are easy to get within doors, and the difficulty of keeping warm and quiet is much more easily surmounted. *Sleeping indoors is better than wakefulness outdoors.*

One should have enough covering to keep warm: no more. If there is difficulty in keeping the feet warm, a hot-water bottle should be used without hesitation and habitually.

The quality of the night depends on the quality of the day. Routine, peaceful activity of mind and body, outdoor air, and exercise make for good sleep. Daily emotional strains, such as worry, discontent, remorse, fear, anger, excitement, upset the night as well. Idleness, and especially the life of the rich female loafer, prepares for bad nights.

The hardest work should be done in the morning and the easiest in the evening. So far as I know there are no exceptions to this rule, though many falsely treat themselves as exceptions. If we are to sleep well, the

daily activities should steadily taper off as night approaches.

Late sleep, begun after 11 P.M., *is apt to be short sleep.* This is probably the truth in the old traditions about "beauty sleep." Sleep begun at a reasonably early hour is more likely to be sufficient in amount and less likely to follow an over-active evening.

There is nothing to be said about beds or coverings except that they should be comfortable. The occasional sufferer from "feather asthma" must, of course, avoid feather pillows and feather mattresses.

Individual experience must determine for each whether the evening meal is to be light or heavy. No rule can be made about it.

Sleep may be prolonged after the morning light comes in by tying over the eyes a black silk cloth or a black stocking *the instant one first wakes*, at or near daybreak. This excludes light and provides the conditions of a dark, cloudy morning on which, as we all know, people tend to sleep longer. This manœuvre can be learned within a week so that we fall asleep again almost instantaneously when the eye covering is in place. Such covering enables us to keep blinds and curtains wide open and so to get the maximum of air circulation. In sleeping outdoors or in the daytime, such an eye covering is doubly useful.

Those who fall asleep promptly enough, but wake early, can often get to sleep again if they have a thermos bottle with hot liquid food (soup, malted milk) at

the bedside, so that a cupful, with a cracker, may be taken without getting up when they wake.

Insomnia is not merely wakefulness, but *wakefulness plus worry.* Exclude the latter and one may be awake a good deal and yet do one's work and keep well. If you do not sleep well, never allow family or friends to question you about it in the morning. Take all reasonable measures against poor sleep, but keep it secret and *never use drugs.*

Food. Adults generally know about what foods agree and what disagree with them. If they follow this knowledge, they rarely go wrong. As we grow older we need less food, especially less meat, and this fact often mirrors itself in lessened appetite for meat.

The quantity of food can usually be settled by one's appetite, aided by two other observations: (*a*) one should not eat enough to feel sleepy and heavy after meals, and (*b*) one should try to keep one's weight near to what is "normal" (i.e., the average) for one's height. Any one noting in himself a tendency to exceed this "normal" should eat less than he wants. Any one tending to fall below the normal should try to keep up his weight by eating more than thrice daily or by taking milk with his meals.

Some individuals do better with no midday meal or with practically no breakfast. This has to be found out by each through experiment.

Eating alone or when very tired does not suit many

people. Pleasant company at meals and a good rest before meals are a great advantage.

No meal should occupy less than half an hour. The chief meal of the day should have an hour for itself. Hurry at meals and "perpendicular eating" at a lunch counter are bad.

Further details on diet are given on pages 111 to 131. Regular *bowel movements* should be made habitual by care and practice. One movement a day is the average. Two a day or one in two days suit some people.

Exercise. The vast majority of healthy people take no exercise beyond what they get in daily work. Those confined to a desk or engaged in any especially sedentary work usually need to even up the balance by doing prescribed muscular work of some kind, if they are to keep well. The essentials of daily exercise are (*a*) that it should produce fatigue, but no more than an hour's rest will recoup; (*b*) that it should make us sweat and breathe deeply; (*c*) that it should be enjoyable, and so make us forget our other occupations; (*d*) that it should be done in fresh air (cool, moving, free of smells).

Walking will do all this for some. For many others walking is not absorbing or enjoyable enough to expel the usual train of thoughts. Then some game or other form of exercise is needed. Gymnasium work seldom secures the essential fresh air. Most gymnasiums are hot and smell when many persons are exercising there.

Gymnastics done before breakfast seem to help some

people to feel more vigorous, but for most the available period is too brief and the exercises too boresome to be of much value. Golf has solved the problem for many of the well-to-do, except during winter months. Skating in rinks fills a place in the difficult winter period. Dancing would be ideal did it not involve late evening hours and bad air. Even with these drawbacks it is certainly of value as exercise as well as recreation. Basket-ball and tennis—especially doubles—are fine for those who can get them. Singles are often too violent for the middle-aged who especially need exercise.

Bathing. A certain portion of mankind feels the better for a daily cold morning bath and is apt to feel an almost religious enthusiasm about it. Another portion feels distinctly the worse for a cold bath before breakfast or finds it merely a bore. Such persons are compelled by no warrant of science to imitate their enthusiastic neighbors. There is no medical authority for the daily cold bath for every one. The shock of cold water seems to start some people's machinery in a useful and agreeable way. But it has, of course, no important connection with cleanliness, for which warm or hot baths are best.

Bodily cleanliness is chiefly a matter of comfort or pleasure, not of health. With some it has moral or spiritual associations which make it a symbol of value, and such people are often doggedly determined to believe in its hygienic value. But I can find no scientific warrant for such belief. Persons and races that never

bathe are among the healthiest of mankind. Skin infections are in some people warded off by cleanliness. In others it has no such effect.

To wash the hands before eating has a known value for health in those whose occupations soil their hands with septic or poisonous material — e.g., painters, butchers — and is a good general precaution.

In civilized communities a certain degree of cleanliness has a social value. It prevents our being unpleasant to our neighbor's nostrils and to his eyes. Its industrial value to those who seek to get or to hold a job is also considerable. To those who cannot feel self-respect unless they have reached a certain standard of cleanliness, it has undoubted moral value. But it should be realized that this standard is quite arbitrary. A frequency of bathing sufficient to make A "feel clean and self-respecting" is wholly insufficient for B and superfluous for C. A lady's hands cleansed and manicured for a social function would be quite filthy from a surgeon's standpoint, and even he, after all his antiseptics, bears germs innumerable beneath the surface of his skin. The sensible person adopts an arbitrary standard which suits his own and his neighbor's tastes.

Sea-bathing at the time of the menstrual period has been frowned on by many, but apparently without warrant. Indeed, some eminent gynecologists hold that the menstrual function is benefited by sea-bathing during menses.

As to *clothing* comfort and respectability rather than

hygiene should be our guide. There is, for most, no other rule. Special fabrics have no merit beyond their comfort.

Innumerable hygienic superstitions gather about the subject of *changes in clothing* at different seasons. Some will not be persuaded to wear light clothes on the occasional hot days in winter. For such prejudices there is, so far as I know, no scientific warrant. Custom and habit rule.

Most healthy persons can exercise till sweat runs free and then plunge at once into cold water with great refreshment and no ill effects. To face cold air in scanty clothing when hot from dancing is likewise harmless for most. "Colds" are rarely caught from cold, and draughts are usually beneficial. To get one's clothes wet or one's feet wet is ordinarily quite harmless unless one gets chilled and stays so for a period sufficient to drain one's vitality. To shiver for hours at a football game — wet or dry — is doubtless to put some strain upon one's reserves of strength. If these are at a low ebb, disease may result. But merely to be wet in this or that part of one's body has no known ill effects or evil tendencies for health.

Menstruation. Here, as in all departments of hygiene, individuality plays a leading part. Some women feel no depression and no need to limit their activity during the menses. Some must absolutely give up and go to bed for a day or more. But these extremes are rare. The great majority of women get on best if they

restrict exercise and mental effort *in a moderate degree*, and especially on the first day. I have known many women who kept too quiet at the menses and were better, both in mind and in body, when they went about more and did more than had previously been their wont. Self-centredness and morbid self-absorption is favored by entire quiet at the menses and psychoneurotic states grow up easily under such conditions.

I remember a girl who always had pain at her menses until a sudden change in family finances obliged her to earn her living as a secretary. Soon after this change all menstrual pain left her.

Moderate restriction, not abolition of normal activities, is, then, the best rule for the great majority.

The menopause, the cessation of menstruation in women at or near the fiftieth year is usually accompanied by changes in the circulation described as "hot flushes" and felt chiefly in the head. There is no reason to dread the period as many have been taught to do and no especial danger of insanity or any other disease at this time. The best hygiene is to pay no attention to the menopause.

When menstrual *pain* and prostration are severe it is best to stay in bed during the first day of the process. A hot-water bag gives some relief. No opiate should be taken and no other drug without a physician's advice. Drugs are seldom of much value. Persistent and severe menstrual pain can sometimes be

helped by surgical measures, but disappointments often follow such attempts, because the trouble is rarely local, generally nervous.

Measures which increase general health and mental vigor — in other words, general hygiene — will usually accomplish all that can be accomplished for menstrual pain. This is also true of menstrual headache.

Scanty menstruation is ordinarily due to poor general condition and not to disease in the pelvis. Stoppage of menstruation has been discussed on page 204.

Profuse menstruation may be considered abnormal when two or three times the patient's usual amount of flow is present. In young women it is mostly due to poor general health with or without anemia, rarely to local disease of the pelvic organs. Hence in young unmarried women local examination should not be made for diagnosis until non-local remedies and hygienic measures have been thoroughly tried out. In women past forty all abnormal flow, whether at or between monthly periods, should be investigated by local examination, since cancer or benign ("fibroid") tumors are, after middle age, the commonest causes.

Restriction of exercise, especially near the menses, and the use of iron if there is anemia, are the most usual remedies, but if the condition persists more than two months a physician should always be consulted.

Too frequent or too infrequent menstruation (like scanty or excessive flow) usually depend on poor general health. But the honest doctor must often confess

that he does n't know *what* "general" trouble is present nor what the matter is. Luckily in most cases the trouble passes off without "the luxury of a diagnosis" or the bother of treatment.

Rest, recreation, vacation. Besides our nightly repose we are certainly the better for one day's rest in seven, and this day should be stretched to a day and a half by the addition of Saturday afternoons. To use up these spare times with chores or odds and ends can hardly be best for many.

On Sundays most of us should supplement our weekday's scanty allowance of exercise, fresh air, recreation, friendship, family life, and religious refreshment. No one defends the popular Sunday habit of gorging and dosing with or without the narcotics of Sunday newspapers.

Most people need a vacation annually or oftener — not only for rest but for change and reorientation. Mothers of families need such a change fully as much as their husbands, but often do not get it. The optimum vacation for most people is somewhere in the vicinity of four continuous weeks annually. Schoolteachers with three months' holidays often have too much of it and are poorly at the end. When school begins again and the harness of routine is resumed, their health and spirits often rise amazingly.

On the other hand, a week or two is often quite insufficient to make up for the wear and tear of the year and even a month is not always enough. The

ideal vacation includes a complete change of scene and an enjoyable change of ideas and occupation. Absolute idleness is beneficial to very few and many are distinctly the worse for it. The "weight of chance desires" and empty hours is burdensome and some sort of routine is usually pleasant even in vacation.

A hobby, an avocation, something other than one's regular work, is necessary for almost all of us if we are to avoid "going stale" in mind and body. The continuous use of one set of mental and bodily activities year in and year out, is stultifying and wearisome. An avocation should grow up early in life. It is hard — though sometimes painfully necessary — to cultivate one late in life.

The main qualifications for a good hobby are that it should be enjoyable and should make us forget our workaday selves. It is well also if it is something that can be carried on when our working strength abates or fails. Most Americans are utterly unprepared to "retire" from business, and do not know how to grow old. Music, reading, chess are examples of avocations which can be continued after our working days are over.

CHAPTER XX

MISCELLANEOUS AILMENTS, TRIVIAL OR SEVERE

Common colds. Infection of the nose, throat, and upper air passages is caused by many kinds of bacteria, and if it is relatively mild it is sometimes called a common cold. It is undoubtedly contagious, and much trouble might be saved if people with colds would keep away from their neighbors. Such isolation is almost the only thing of importance in the management of the disease. If there is fever with it, the patient should remain quietly at home, but it is rarely necessary to go to bed. We know no way to shorten the course of the disease, but it is certainly wise to increase our allowance of sleep and to cut down on all forms of strenuous activity. Drugs do not seem to me of value.

Vasomotor rhinitis is the sudden appearance of a nasal discharge, with or without sneezing. This is akin to hay cold but comes at all seasons. The whole thing may disappear within a few hours. It is not a germ disease and has nothing to do with a common cold, but for the layman the two are usually quite indistinguishable. Remedies taken for vasomotor rhinitis are often given credit—quite falsely—for having cured a cold.

Hang-nail and *paronychia* are manifestations of lowered vitality. A minute slit at the root of the nail does not become a hang-nail unless it gets infected by

bacteria. This, in turn, does not happen unless we are below par physically. It is, accordingly, a good index of general condition in many persons. If the infection works more deeply into the tissues and leads to pus formation, we call it paronychia. The latter may have to be cut open, but it many cases it will heal itself, like a hang-nail, if the patient husbands his resources of strength by taking things easy and increasing his allowance of sleep.

In-growing toe nail is usually a wrapping-over of the flesh next to the nail, owing to pressure of the shoe, and does not come to our notice unless, like hang-nail, it becomes infected. A bit of surgeon's plaster drawn around the toe, so as to pull back the flesh from the edge of the nail, is often sufficient to stop the trouble, provided the impinging corner of the nail is cut habitually short. In extreme and long standing cases a slight operation may have to be done.

Bursitis over the shoulder joint is the usual cause of a stiff and painful shoulder, with difficulty in raising the arm above the head. Even a slight blow upon the shoulder may start such inflammation of the bursa, which is a little lubrication-sac between the head of the humerus and the projecting wing of the shoulder blade. Sometimes such inflammation comes without any cause that we can find. However it starts, it has an astonishing power to make the shoulder muscles waste away and to cause troublesome disability within a short time. The great majority of cases get well with-

out any surgical interference, but it often takes weeks of painful effort to win back the use of the shoulder muscles. Patients must be urged to attempt the motions most difficult for them and to do this several times a day, despite pain.

Shingles is a disease showing itself by a group of water blisters and sores, usually along the side of the chest, occasionally in other places. It is a manifestation of nerve-infection and follows the course of one of the nerves which run between the ribs. Distressing neuralgia may precede or accompany it. It seems to be commoner in elderly people. Considerable relief from pain may be had by freezing the skin with an ethyl-chloride spray over the point of exit of the affected nerve from the spinal cord.

Chorea or St. Vitus's dance. Though something has been said of this disease in an earlier chapter, I wish to emphasize here certain further points. It is a germ disease, due to the same streptococcus which produces rheumatism, tonsillitis and heart trouble in children. The usual age is from five to eighteen. It is a self-limited disease and runs its course ordinarily within a few weeks, but like other streptococcus infections, it is prone to relapse.

The child makes restless motions, especially of the hands, face, and feet, and is apt to be reproved or even punished for being "fidgety." Any careful observer, however, would notice that the motions are beyond the normal. In severe cases the whole body may be in-

volved and even sleep may give no respite. The child should be taken out of school and in all severe cases kept quiet in bed. Medicine does not help.

Chorea should be distinguished from habitual nervous jerkings of the face or other parts, known to neurologists as *habit spasm*. The latter lasts for life and is part of a general nervous constitution. It has nothing to do with germ disease nor with heart trouble. Winking and grimacing involuntarily are its commonest manifestations and are more frequent when the person is tired or strained. It is something to be lived down, not treated.

Hernia. By far the commonest variety occurs in men and shows itself in the groin. It is not due to accident and should not be called *rupture*. It represents a weak spot in the abdominal wall, present from birth, but gradually enlarging with age and labor until a bit of bowel protrudes, covered only by the skin. In mild cases the bowel can be held back satisfactorily with a truss, but this is so much bother that operation is usually advised, especially in young, strong people. The opening is sewn up tightly, and if the operation is well done permanent cure results.

Such a hernia is often discovered accidently and is then referred by the patient to some recent or distant muscular strain which, in the vast majority of cases, can only aggravate, more or less, a previously existing hernia.

Hernia through the scar occurs after operation, when

the incision has been long and slow to heal. The bowel pushes out through the weakened abdominal wall. The same thing may happen at the navel, owing to congenital laxity and weakness of the parts.

Any hernia which is not kept back within the body may get nipped or twisted ("strangulated") with the most alarming results. Only a quick and skilful operation can save life. The symptoms are pain, vomiting, and abdominal distention.

Congenital deformities are common in the lip, palate and feet. There may be a *cleft* along the arch of the hard *palate* and through the upper lip (*hare-lip*). Both these deformities can be cured by an early and skilful operation. The various types of deformed or *club-foot* should be treated by a competent orthopedic surgeon. A good deal can be accomplished by operation and apparatus, but more or less lameness generally remains.

Enuresis is a prolongation into youth of the baby's natural inability to control his urine. Most children learn this within the first year or two but in others, especially of a neurotic or slightly defective type, the control is not acquired. There is no disease of the bladder or anywhere else, unless it be of the brain, — that is, a greater or lesser degree of feeblemindedness. Enuresis is especially common in children of the reformatory type, which indicates, I suppose, its connection with congenital weaknesses.

Treatment is directed to the establishment of con-

trol through rousing dormant faculties. In the milder types, when the trouble occurs only at night, it can generally be cured by one or more of the following devices: —

(*a*) The child should never drink any water after 6 P.M. (*b*) An alarm clock set for the hour in the night in which a child generally wets the bed, or for a time about half an hour previously, can be arranged so as to wake the child up and have him get up and pass urine. (*c*) An ordinary wooden spool can be fastened with a piece of tape in the small of the back, the tape tied round the body in front. This makes it impossible to sleep comfortably on the back, but gives no trouble so long as the child sleeps on the side. Like the alarm clock, the spool tends to make the child subconsciously aware that there is something which he should look out about, and trains him in the sort of auto-suggestion out of which presumably control of the bladder comes. (*d*) Pumping cold water upon the back, up and down the spine, with a Johnson pump, for five minutes just at bedtime, is sometimes effectual, I think by suggestion. (*e*) The same holds true in my opinion of the various *operations* often done for the relief of enuresis. Any operation, such as tonsillectomy or circumcision, makes a strong impression upon a child's mind, especially if he is made to understand that the operation occurs because of his enuresis. (*f*) Direct moral suasion sometimes has an effect, especially appeals against the childishness of bed-wetting and explanations to the effect

that as one grows up one outgrows this sort of babyish action. Medicines have not seemed to me effective, though the tincture of belladonna is often given.

Stammering is a disease not of the mouth or throat but of the brain and the powers of control. It is very catching among school children, and any one with an organism predisposed to it will begin to stammer if he hears others around him doing so.

In treatment it is essential that the child should be kept away from others who stammer. Beyond that he should have a course of training under some one who has given special attention to the subject. There are many methods designed to overcome stammering, and most of them are successful. But it is most important to get hold of the trouble in early life, and not to let the habit become firmly ingrained.

Marasmus is a term still used by specialists in children's diseases, as well as by the less expert members of the medical profession, to indicate an extreme degree of malnutrition without discoverable cause. *Infantile atrophy* is another term often used for the same condition. Of course it is essential to distinguish marasmus from the emaciation secondary to tuberculosis, syphilis, or gastro-intestinal troubles.

The cause of the disease is wholly unknown, and treatment is very unsatisfactory.

Still-birth. The term is applied somewhat loosely both to children whose death has evidently occurred early in intra-uterine life, and to those who show no

signs of life at the time they are born, but presumably have not been long dead. Some physicians also apply it to children who are alive at birth but die within a few hours without known cause. Syphilis has long been supposed to be the most important cause of still-birth, but there are certainly many cases not thus to be explained, and not satisfactorily explained at all. The nutrition of the mother during pregnancy doubtless plays an important part, as still-births are much commoner in badly nourished families.

Starvation is a condition very rarely seen in this country except as a result of gastro-intestinal disease. In stowaways aboard ship one occasionally sees pitiful cases of starvation. Doubtless much of the ill-health to be seen among the poor is influenced by chronic malnutrition, but it is very difficult to be sure upon this point.

In true starvation, such as one sees in a stowaway, the most important thing is to prevent the individual from eating as much as he wants to when first he gains access to food. A small amount of liquid nourishment should be allowed every hour for half a day, then gradually increasing amounts of solid food, but always under the directions of a physician.

Obesity is usually a congenital tendency rather than a result of overeating. Fat people often eat less than others. Their fat, nevertheless, burdens them like any other weight that we have to carry. It is a strain on the heart and on the joints. It pushes up the diaphragm

and cramps the lungs. It makes people bear operations badly and shortens life.

It can be removed by getting up from meals before appetite is satisfied, seldom by cutting out particular foods, for others are usually eaten in excess and make up the balance. Exercise is apt to increase appetite and so to make dieting harder. Diet is therefore the essential thing in treatment.

Cancer has been referred to in connection with the stomach, the gullet, the intestine, and the uterus. Something should be said of the disease in other parts of the body. On *the lower lip* cancer occurs almost exclusively in those who smoke a pipe, and is the best example of the part which is played by chronic irritation in the development of some cancers (though *not* of all). On the lip or on other parts of the face cancer is a relatively mild and slow-growing disease, permanently and wholly cured in most cases by a moderately extensive operation. It shows itself as a harmless-looking sore which *will not heal.* Any such sore on the lip or near the eye should always be examined by an expert.

Cancer of the rectum produces rectal pain and a bloody discharge with diarrhea or alternating diarrhea and constipation, usually in persons past middle life. The disease is sometimes mistaken for piles. Operation is the only hope.

Cancer of the breast produces a lump, usually painless, in the breast of a woman past forty — occasionally in earlier years. It is best felt by pressing the breast flat

upon the ribs with the palm. *Any lump in a woman's breast should be shown to an expert for diagnosis as soon as it is discovered.*

Many non-cancerous lumps in younger women are now removed by surgeons, because the best-informed opinion holds that about ten per cent of them later become cancerous.

"*Grippe*" or "*Influenza*," in the strict bacteriological sense, — the disease due to the influenza bacillus, — is at present so rare and so difficult of recognition that it deserves no mention in this book.

Popular self-diagnoses of "grippe" are usually made when people prefer a term more high-sounding than a "common cold" (see page 505) or when a *streptococcus tonsillitis* (page 49) *and pharyngitis* (page 51) is the true diagnosis. This is probably *the most expensive of all diseases* if we take account of its results in the joints, the lungs, the heart, the kidney, and the ear. But at present we know no effective treatment for it and can combat it only by "giving up to it," i.e., by going to bed and not trying to carry on our industrial activities and our fight against disease simultaneously. Possibly better milk supplies may prevent a portion of our "colds," as the causal streptococcus is sometimes carried in milk.

Sometimes the disease attacks or "settles in" the trachea or main trunk of the windpipe just below the vocal cords. *Tracheitis* is then its proper name, though it is apt to be called "bronchitis."

POSTSCRIPT

PURELY medical books do not end happily, but as this book is almost half human, it may well be rounded off with a consoling fact about *disease;* viz.: *that it usually gets well of itself if given half a chance.* Many a victory over germs is so easily won by the body's healing powers that we never experience any illness at all. Traces of the struggle are left in the tissues, but the patient never knows it.

When the attack is forcible enough to make us aware of disease, we try to aid nature. By rest, diet, nursing, or surgery, we clear the way for nature's Army of Restoration.

Occasionally we take a more decisive part. In eight diseases, — malaria, chlorosis, myxedema, syphilis, diphtheria, latent tetanus, sunstroke, hookworm, and a few other tropical diseases, — what we do may really be called cure. In 270 (odd) other diseases as listed in textbooks of medicine, nature with some help from our hygiene can usually do the work. It is only in cancer and a few other maladies, — most of them rare, — that nature does little or nothing for our restoration to health.

In most instances, then, it is a winning fight that we enter when we contribute our tiny strength to aid the colossal and beneficent ingenuity of nature's sani-

tation. What we do is vastly worth while because it tries to imitate and in some degree to supplement the ever-active Power not ourselves that makes for health.

THE END

INDEX

INDEX