The Blood Pressure

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THE BLOOD-PRESSURE

A stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, June 3, 1909, at 8:00 P. M.

by

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I will talk to you tonight a little while about blood-pressure. I hope you won't get frightened or pessimistic, for to be forewarned is to be forearmed, and it ought to be a consolation and a comfort to one to know his real condition, to know what to plan for, what to calculate upon. When one finds his blood-pressure is 200, and he discovers that the cigars he is smoking are raising the blood-pressure every day; and that every cup of coffee or tea he takes is raising the blood-pressure a little more; and that every poison is working, right along in the same direction, it is worth while to know these facts, to know how he stands; it is a worth a great deal to know it. It may be the means of saving his life now and then. That cigar will raise his blood-pressure twenty points; so he must cut out the cigar, because his blood-pressure is at 200, perhaps, and by and by the time will come when the blood-pressure will be higher still, be 240; then maybe he will take a cigar some day, and a blood-vessel will burst in his brain; and that will be the end of him. So he better stop smoking.

But we will get back to this diagram. I want to make this clearer to you. This is the heart, the pump. The arteries are the tank, a closed tank into which the water is pumped, the liquid is pumped so that it is under pressure. The blood is circulated at a pressure of 100. Now, when the blood is kept in the arteries at a pressure of about 100, that means four inches of mercury—a column of mercury four inches high. That is what it means. When the
When the blood is circulated at that pressure, that amount of pressure is required to furnish to the brain the blood it needs, and to the liver, and the kidneys, the lungs, and the heart itself, and the muscles—all the various parts of the body and the various organs of the body, the amount of blood that is required to sustain their functional activity. If the ends of the arteries were as large as the beginnings, and the arteries open straight into the veins, there could be no blood-pressure, no retention or pressure, but the arteries end in very small terminals, very small branches, and these branches have muscular walls which are able to contract and to dilate; so the opening from the arteries into the veins where there is no pressure practically, are controlled. They are sometimes smaller, sometimes larger.

Now, for example, in a muscle, here is a muscle; this muscle needs blood when it works; and when it is working this way there is more blood in it than when it is idle. When it is idle it is pale; when it is working it is rosy, fully of blood. Now, when I say to myself I am going to shut my hand; I am going to contract the muscles of my arm, before I contract them, just the instant before I have performed the act of contracting the muscles and closing my hand, the blood-vessels dilate. The thought in my mind that I am going to shut my hand,—that thought prepares the muscle; a telegram is sent to the muscle to get ready; there is business required of it, and it must prepare; so the muscle prepares; the blood-vessels dilate and the muscle is then all ready to supply explode, so to speak, for a muscular contraction is a sort of explosion; it is an explosion of energy, a manifestation of energy. When you strike a blow, there is a little explosion here in the muscles that executes that; and this movement is prepared for by the dilatation of the arteries in the muscles, so that more blood can flow into that part. So, during sleep the brain is pale; but immediately that sleep is broken, at once, when the awakening comes, the brain becomes rosy, suffused with blood. This was observed first in the monkey. A portion of skull has been
removed so it could be examined, so the brain could be seen, and the observer watched the monkey when it went to sleep, and noticed the brain was pale, but as soon as the monkey awakened, the brain became rosy, swelled out so it partly filled the opening in the skull. Afterwards a man had an accident which opened a considerable part of his skull, and he was observed by a Berlin physiologist under the same circumstances. The same thing was observed in him—that when he was asleep the brain was pale, and when he awakened, the brain became ruddy again. Now, that is because of the varying condition of these arteries, the small arteries. They contract and the part is pale. Rub cold water upon the skin, and it first becomes white, blanched because the arteries contract. It afterwards becomes ruddy, reddened when the reaction comes, because the blood-vessels have dilated; and that is what a reaction is. So there is a constant play of these little arteries represented here in these smaller lines, constant play of the muscular walls contracting and relaxing, so that each part shall have just the amount of blood required; because (before dinner the stomach is pale; but after dinner it is rosy, because the blood-vessels are dilated so that the blood can flow in freely and furnish the material out of which the gastric juice necessary for the digestion of the food may be formed.) So by means of the contraction and dilatation of these small arteries, the blood is regulated.

When the openings are small, then the blood pressure rises; but when the openings dilate, become over-large, then the blood-pressure falls; the blood hastens from the arteries so rapidly that the pressure can not be readily maintained. Now, the blood-pressure, by the contraction of these arteries, may be increased, which will hold the blood back; or by increased activity of the heart, which will drive more blood in. You can readily see how that will be.

Here is another interesting thing to notice. Here are the vessels which might be considered the reservoir of the blood; here are the muscles which
are capable of holding half of all the blood in the body; here is the skin which is capable of holding two thirds of all the blood in the body. By the way, the veins of the abdomen, the splanchnic area, or the portal system—the veins, vessels which are found in the abdominal cavity are capable of holding all the blood in the body. Now here is another interesting thing we see—blood-vessels and the muscles—the blood comes into the muscles and veins and is gathered up, comes into the general circulation, goes to the right heart, and here it is pumped around through the lungs, then to the left heart; then started off on its circuit again. Here the blood in the skin is gathered up in just the same way; but the blood from the portal circulation is just very little of it gathered up in this way. The great majority of this blood passes through capillaries, through the capillary system in the liver, just the same as the arterial blood passes through a capillary system. So the blood from the veins of the portal circulation passes through a capillary system in the liver for the purpose of filtering it and performing other functions upon it before it passes into the general circulation. So here is something to hold the blood back you see. This capillary circulation here, introduces an element of conversion, and holds the blood back in the portal circulation; so it is very important that the liver should be located just where it is—just beneath the diaphragm, just beneath the chest; and as the chest walls expand in taking a deep inspiration, the diaphragm comes down as far as this; it compresses the liver and forces the blood out of it; and as the chest expands, it makes a suction and a partial vacuum here, and that sucks the blood into the chest cavity. The diaphragm on one side compresses the liver and forces the blood out, while the inside of the chest cavity expanding, producing a vacuum, sucks the blood out of the liver; so there is a force action, and a suction action brought to bear upon the liver, both at the same time. That is why breathing is so important an aid to circulation and to digestion. Here is the blood coming from the stomach through the liver, and it is by this action of the chest.
and it is by this action of the chest. So we have breathing exercises after
dinner, in order to help pump the congested food out of the stomach. It helps
empties
send it on; and it the portal circulation here, keeps the blood from ac-
cumulating in this great system. Every breath we take compresses these veins,
drives the blood from the heart, draws it up into the chest, and that empties the blood-vessels so they can absorb more of the digested food. This
is an exceedingly important fact. Now, you can readily see why a person does
not feel so bright after dinner, why he may feel a little sleepy. It is
because so much blood runs away into this portal circulation he does not have
enough blood to keep his brain active. After dinner, also, sometimes one feels
not quite as strong as before, not quite as much energy as before, languid,
for that very same reason. You see also why a person who has the habit of sit-
ting in a relaxed position so that the abdominal muscles are relaxed, and the
portal circulation swells out and fills with blood,—you see how this accumulation
of blood in his portal circulation, which is capable of holding all the blood
in the body, may drain the blood away from the brain, muscles and other parts,
so rendering the parts inefficient.

Now here is a thing that is very important. When you find the blood-
pressure rising, it is because these small arteries have been partially obstructed
so the blood can not get out of the large arteries into the venous system. The
arteries have been destroyed. Suppose for instance, we have a blood-pressure
of 100 here, and now every one of these openings is filled up; it will take a
pressure of 200 to get the same amount of blood through; because there are only
half as many openings. That is exactly what happens in arteriosclerosis. The
small vessels are stopped up, contracted so the blood-pressure must be higher in
order to get the blood through; and the heart becomes gradually worn out and
weakened. Here is this great organ, the heart, which is a muscular organ
just the same as any other muscle in the body; which contracts just as any other muscle contracts, and when it has too much work to do it gets tired. Think of it—contracting seventy times a minute while we wake, and while we sleep, making a very slight pause after each contraction, during which time it takes a little rest,—a very slight pause, just a fraction of a second, a few tenths of a second the heart pauses and rests after each beat; and that is all the opportunity it has for rest; it must go right on working faithfully all our lives; and when the heart is weakened by overwork, then it begins to stretch, and dilate, and by and by gets to be two or three times as large as it ought to be, and loses its power to contract; so instead of contracting firmly and emptying itself, and driving this blood on with force in the arterial system; it only partially contracts, makes a little contraction; never shuts up completely; never empties itself fully; only makes a slight ix contraction, works away in that way, and the blood is very imperfectly circulated. The heart continues to dilate more and more until it becomes three or four times as large as it ought to be, and its force is so weakened it can not circulate the blood properly; and then the hands begin to swell, or the feet first begin to swell, dropsy comes on and affects the whole body sometimes, and something must be done for the patient pretty soon, or he will die.) But patients frequently come here in that condition, and we are often able to save the patient's life. I met on the porch the other day a lady whose face had a cheerful smile which gave me a great deal of joy, I assure you, because six weeks before I had said to her daughter, "You must take your mother home; there is no hope for her; we can do nothing for her. She came too late, and I fear she has but a few days to live; I think you may barely get her home." But that brave woman refused to go, and the brave daughter backed her up. She said, "No, my mother must get well," and they stayed here in spite of my evil prognostications; inspite of what the Christian Scientists
would call an atmosphere of doubt. I do not intend to encourage doubt, but I only wanted to be truthful. But in spite of it, I found this good woman whose lips and face were blue, unable to lay her head down upon a pillow, sitting up in bed day after day, night after night, never for a moment lay down; and I found her here in a wheel chair rolling up and down the porch, looking bright and happy, the swelling, the dropsy gone, and really making wonderful progress toward health. She will never get entirely well, of course, but she is wonderfully improved. We never can tell what marvelous resources Nature may have left; we never can tell how much power of recuperation there may be still in the body. It is this wonderful via medicatrix naturae the ancients used to talk about, this wonderful healing power present in the body is the thing to which our appeal is made, the thing which our methods of treatment here and our remedies co-operate with; and upon these we depend for a cure.

Notice this artery here. When arteriosclerosis reaches these arteries of the heart, then the case is very sad indeed, because the heart itself is deprived of the blood which it needs, the blood supply which it needs to support its muscular action. And now here is another question of very great importance. Here is the liver. This liver must have blood circulating through it. Here is the appearance of a healthy liver, and here is a liver which is contracted. It will be only about a quarter as large as the healthy liver. It is contracted, cicatricial, has lost its elasticity, and its blood-vessels are contracted to such a degree that only a little blood can get through it; and the natural consequence is that serous fluid is forced out into the abdomen, and ascites of the abdomen, dropsy results. It is a condition which can sometimes be relieved, but can not always be relieved.

Here is a healthy kidney, and here is a cirrhotic kidney, a kidney which has become contracted, white and scarlike tissue, hard, contains very
little blood, and very little blood can pass through it. Such a kidney is
doing very little work; it has lost its usefulness, and on that account it is
impossible for the poisons to be eliminated from the body, impossible for the
blood to be purified; so the mischief becomes intensified. The poisons per-
haps, of the blood accumulate; the poisons which produce disease of the arter-
ies have now produced such disease of the kidneys that they can not escape; so
they accumulate in the blood more and more, and the disease goes on with very,
very great rapidity. It is a good thing to look at something healthy
once in a while so as to refresh our minds.

Now, I am going to say a few words to you about the little prescrip-
tion booklet which is furnished to you when you come, and I trust you are
making use of it. You see the names of the faculty here, and here is something
which you are requested to please read carefully. I wonder how many of you
have read this carefully. May I take the liberty to ask how many have read
these few introductory remarks with care? Hands up. I would like to see how
much attention is given to this. Now, thank you very much; I am very much
obliged to you, friends, for reading these lines which I wrote with a great deal
of care; and I hope every one that has not taken the trouble to read it will do
so, because here are facts of very great importance for you to know.

It is important, in order that you should get the benefit of this
method, that we should have your co-operation. It is necessary that we work
together in this thing. Suppose you have had the habit of eating too rapidly,
neglecting to masticate the food thoroughly, and you think it is hardly worth
while to take the trouble to correct that wrong habit, and it happens that wrong
habit is the chief cause of your disease. Suppose you are suffering from
hyperacidity. That is produced by that fault more often than by any other.
The two things that produce hyperpepsia, or hyperacidity, that I think are most
effective in producing it, are this matter of hasty eating, and the use of condiments,—mustard, pepper, peppersauce, ginger and things of that kind, and the use of beefsteak, a meat diet. Those are the things—hasty eating, condiments, and a meat diet. Those are the things that produce hyperacidity. Now, we must remove the causes. If you have been smoking, taking tea or coffee, been eating too much, fat have been eating too much of all sorts of food, whatever the cause may be, it must be removed; and we must earnestly seek out the cause. We must co-operate with the doctor, confide in him, and advise with him, and be sure we find the cause of the difficulty. If we don't find the cause, the treatment here will be only palliative; it will only be superficial in its results, temporary, and when you go home the evils will all come back again, and you will feel that your work here has been of little use.

We must find the natural way of life. We can not hope, if we are going in the wrong way, that we are going to find relief while keeping on in that way; we must turn about from the wrong way, get into the right way, and stay there, travel there. I hope none of you are hoping for an experience of a few weeks here to do penance so you can go back to your old ways again. I hope none of you are hankering against the flesh pots of Egypt which you are protected against here for a short time. I hope you are not thinking about Chicken pies, pate de foies gras, Edam cheese, stewed oysters, deviled crabs and other things of that sort. I hope you have bidden good bye to these things for ever, that you are determined to find the right road and keep in it.

Why, my friends, what is the use of living if we are miserable, and sick and suffering? You know it is not comfortable. You are here at a good deal of sacrifice of time. Now, when you are here, find the right way, see how important it is to follow in the right road.

I got a letter today from Mr. Horace Fletcher. He is coming back to
America in a few days now. He is coming back on the Mauretania and will be landing here about the tenth, and we shall see him here probably sometime this summer. It is a delight to get a letter from Mr. Horace Fletcher, he is so full of optimism, and he is always telling the same good, sweet blessing he has gotten from following in the right road, and he is so happy he is in it, and so diligent in it and in getting other people to get into it that he has come to be a great leader toward the way of life; and I am very glad of it, glad he is in the public eye. While he has only been a short time in this good road himself, he has all the enthusiasm of a new convert, and he is telling everybody he comes in contact with how much good it has done him, and getting them infected with the same idea, and the same enthusiasm. And Mr. Clark has got infected with it, Mr. Clark, the head of the Christian Endeavor movement; and the Christian Endeavor World has taken up this health idea and is exploiting it, and I see a good many of the magazines are doing the same thing. So health ideas are pervading the whole community everywhere, and intelligent men and women everywhere are studying this question, and are considering it as one of importance, giving attention to it, whereas before it was so much neglected.

The natural diet is one of the essential features of the Battle Creek Sanitarium System. That is the idea of this institution, my friends. Your diet at home did not do you any good, apparently. You went somewhere to mineral springs, took some baths, and they did not do you any good; or perhaps did you a little temporary good, but only temporary. Change of climate did not help you out. You slept outdoors, perhaps, and that helped you a little while, but the old troubles were back again. Then you tried various other things,—osteopathy, electricity, did a great many other things, each one of which seemed to help a little, but none of them cured. Here the idea is to bring all these forces of Nature, these powerful physiologic means of cure, together, to get
them all at work together to get them all lifting together. I saw some men lifting at a big stone once in a hole. There were half a dozen men standing about, each one trying to lift it alone, and could not do it. They might have said, "Here are six of us; we have all tried it and could not get it out of that hole." By and by the whole six got hold together, and when the whole six got hold, the leader said, "Hee hee!", and that great stone rolled off down the hill, and the thing was done. There were six of them working all together. That is the principle of this institution, the philosophy of it,—to associate together all phases of physiologic means, and get them all working together. In the morning you get up and have that morning bath, maybe a spray, or maybe a plunge into the swimming pool; maybe nothing but a wet hand rub, or mitten friction, or some simple kind of thing that gives you a little lift. That is the starter in the morning, if you please, that little application of cold water. Cold water has wonderful lifting power. It is really the most powerful healing agent in the world,—is cold water. It is a vital stimulus of the highest character. I came very nearly saying of the first water, which would be literally true. Cold water is a stimulus of the nerve-centers. When you put cold water upon the whole surface of the body, all the vital functions give a little leap of joy. The body rises to the emergency, so to speak, and things are lifted; so the cold water is the thing to hanker after, my friends, and to thirst after. Ask your doctor to give you a little more cold water and keep calling for a little more cold, and get yourself accustomed to it. When you find yourself able to take a good, vigorous cold bath, and enjoy it, and come out with a fine glow, and a good reaction, you feel better all the while,—no headache after it, no languor after it, no after gasp,—reaction after it,—when you find yourself doing that, you may know your resistance is improved and you are getting on your feet, on higher ground, better resistance; when you have good resistance
to cold water, you have good resistance to disease. It is the same thing; and this building up of the resistance by means of cold water has been demonstrated to be a means of protection against disease and a protection against infection. It is a thing to be cultivated. Now, if you have this program, get it filled out and study it until you know every detail of it. Have you talked with your doctor so you know how many baths you are going to have, and at what hours; how much exercise to take; when to go for the mechanical Swedish movements; when to go for all the other things you have? Are you doing that—going right along and pursuing this program every day so that every half hour you do something different which gives you a little lift? Keep busy, just keep busy. When you find the thing that needs to be done, and the importance of the thing, get busy to do it right away, and keep right at it.

Don't neglect to consult with your doctor every day. The doctor wants to have a chat with you to look into your face, to see whether you are keeping in line or not. I can generally tell by the look of the patient's face whether he is packing his trunk or not. I used often to accuse people of getting their trunk packed, and find I was telling the straight truth, and I generally got them unpacked. Our patients get away too fast these days before they get half cured. The majority of people get away just about the time they begin to get well. It is just like pulling up the corn before it gets out of the ground. My friends, if we could keep people here long enough to really accomplish all we could possibly do for them, it would not be six months before the town could not hold the people who would come. The fact is, we send out only a very few people who have achieved all it is possible to achieve by working this mine. How different people act. They come here to the Sanitarium, and just as soon as they find they have struck a great gold mine, that there is health here for the taking; that there is wonderful health, vigor, and improved
efficiency that can be,—instead of working it and getting all there is out of it, as they would if they had discovered a mine in Colorado somewhere, they get up and go right home, and say, "Now, I have got enough out of this to coach myself, so I can go back and engage in my business now, and if I have a relapse I will come back." If you should find a gold mine, you would go after it, and fence it in just as quick as you could, then dig and dig and dig, and you would never get enough. If you would get as much as Rockefeller, you would want more, and you would keep on digging. As long as the nuggets are there, you will be after them. Isn't health worth more, my friends, than all the gold in all the mines in all the world? You would not trade your health for all the wealth people could give you. And now, here is life for the taking; here is health, vigor, longevity, years and years that can be added by laying in a stock of vigor and vitality; but we see people turning their backs upon it and going home just for some poor, little, miserable whimsical excuse. I have actually known people to write home to get somebody to telegraph them to come home to attend to business, so they could have an excuse to get away, you know. By and by they have come back to get fixed up a little bit. Don't go and throw away what little energy you have got left. Go and invest it in health-getting, rather than in having a good time somewhere, in business or something else, so that by and by you will come back and we shall find you have not got capital enough, vitality enough left to start again. People wonder why it takes so long to get a start. I met a lady today here about the fifth day, and she wondered why she did not improve faster. It is because her vigor has been thrown away; it is lost to her; she has expended it, expended her vitality in some other ways. Get your program, get right to work it, and make a business of it. Talk to your doctor about it. There is a doctor on call from the
medical office at every hour of the day or night. Sometimes, of course, the
doctor may be out for a few minutes, answering a call, but he will be back soon
to be notified. Call up the medical office, keep in touch with the faculty,
with your doctor, with the office, and see that everything is made right. If
there is anything that annoys you, if you are uncomfortable about anything,
don't hesitate at all to call attention to it right away. If there is disturb-
ance of any sort, see that it is stopped. If your telephone is out of order,
have it fixed right away. If there is anything in your room that is not satis-
factory, or about your case in any way, make a stir about it and have it cor-
rected right off. If you don't get it done appeal to me. I met somebody
the other day who said he had been here two weeks and wanted to get in touch
with me and could not. I suppose he did not know I have a telephone at my
ear night and day, any time. You can get hold of me any time it is necessary.
I am not bidding for calls, but I want to say to you I am accessible, and your
not doctor is accessible. There is a doctor connected with the institution here
that is responsible, that has a list of patients, who has not a telephone right
at his house, in his room, where he can be gotten day or night, any time. We
are all on call. It is our duty to look after you, and we want to have your
co-operation in this thing. Go and report.

We haven't any secrets here. It is our ambition to make everybody
as wise as possible, to make everybody who comes here as independent of us as
possible; to teach every one how to live. It is a pity that our modern system
of education is so faulty that when a man gets through his college or university
course with a very splendid equipment of almost everything but the things he
needs and must know,—the knowledge of himself is most neglected, so that a
little later from now, just about next week, there will be turned out upon the
world from the colleges and universities of the country, a great number of
people who are actually crippled by the months and years they have spent in the
school room, or in studying the things that are of less importance than the things that might have been presented to them. The most important thing has been neglected altogether; the greatest thing, perhaps, or one of the greatest things,—indeed, it is a thing which this institution is seeking to supply for hospitals or remedial institutions, for college-maimed and university-crippled men and women. We get quite a number of them and we do them all the good we can. Become familiar, as I said, with the Battle Creek System, with these principles. None of them originated here; they are not new; they are simply the old principles that have been borrowed—lost in the middle ages, the dark ages that preceded us,—they have been lost, and they are now coming to the surface and we are gathering them up. Look for the old way; get back into the old paths again; read Good Health and other literature. The June number of Good Health is now out. Everybody ought to read it, and every patient who comes here ought to subscribe to it before he goes home. I would like to feel that every patient is keeping in touch with us, with what is going on here, so you can keep in step with progress that is being made. I am always glad to have our patients have the journal, because I want you to see the new things we are finding out. Every year we are finding out some things that are so much better than what we had the year before that we want everybody who has been here to have a chance to learn it. We had a little faculty meeting this afternoon, before I came in here, and we were studying in faculty meeting, and I was thinking to myself, "How in the world would we doctors ever get along if it were not for these principles? I looked at one doctor, and I thought of him, how much good he has gotten out of these principles"; and we often sit and congratulate ourselves that we know these things and are able to make use of them for ourselves. I am glad to tell you there is not a doctor in this institution that xxx xxx is not living up to these principles; there is not a doctor here that
does not believe them and is not following them in his family. There is not a
doctor in this institution that has a home and children that is not rearing those children in accordance with the strict principles of the Battle Creek Sanitarium, that you are instructed in here. We believe in them; we are sure they are right, and true; and we love them ourselves, and we profit by them, and xxx we want you and everybody else you have influence with to profit by them also.

Cultivating health is much the same thing as cultivating potatoes. The farmer plants them, helps them grow by cultivation, etc. Then they grow naturally, and by and by the potatoes come. It is just the same with health. The Battle Creek Sanitarium is a place where people eat, and exercise and do everything for health. Now, my friends, be sure you are doing all you can. Here are opportunities all about you. Some of them are not being improved as much as they might be.

Spent every moment possible out of doors. The time has come when there is no excuse for staying indoors. We are getting the outdoor gymnasium in running order, and I hope pretty soon we will see you all out there.

The healing power, the creating power, the power that made you, is the power that helps you get well. This power is manifested in you that keeps the lungs and the heart going while you are asleep, and it is the same power that is within you, healing you.

Here is the daily program. Be sure you look that over carefully and are getting everything you ought to be getting. If there is anything in that program you are not getting, your doctor will permit you, let be sure to get it. Here is a place for appointments, examinations, for arranging baths, etc., see that that blank is filled out, that there is nothing absent. Here is another week's prescription, and here is a diet prescription,—the number of calories
you ought to eat should be put down there, and the actual ration you are going
to take. Here is the number that a person of your height requires, the normal
ration. Maybe you are too fat, and need to have your weight reduced, so you
will reduce the number of calories in your ration; so you won't need so many,
so it will be a smaller number. Maybe you are too thin and need to be fattened
up a little; then the number of calories will be larger. Here is the pre-
scribed ration that you should have,—the proteins, fats, and carbohydrates. Here
are special diet directions, special orders, special meals, water drinking—see
that this is all put down. Ask your doctor how much you shall drink. Take it
mathematically and have a regular time for it. Here are special dietaries. Your
doctor will indicate how much you ought to eat. Get a card. Keep your record
of your calories, so you will have it to show when you get through, and just
see how the digestive power of your stomach is improved; it will be an indica-
tion that you are doing the thing scientifically, applying business methods and
principles to this work of getting well.

Electrotherapy, radiotherapy, if you need any of those things, here
is where the prescription will be indicated. Ask the doctor if there is any-
thing there that will help you to get along. I met a lady today who was kind
of disappointed because she has recently found out some things she did not know
before about, that she had not had the benefit of. If she had looked this plan
over she would not have missed that.

Here is phototherapy, thermotherapy, and massage. If you have got
a pain somewhere, don't ask your doctor for massage or electricity, for it won't
help that. There are so many things here that sometimes it is difficult to
think of them all and get them all marshalled into the work, get them all at
work upon one case. So you must help about that if you will. And here are
the manual Swedish movements. Here are so many things of so much importance.
Hardly a person comes here but what might be benefited by these movements. Here is opportunity for specific prescription for exercise and rest, and directions for the work in the gymnasium and for the mechanical Swedish movements. Here are different kinds of apparatus there, different appliances which do different things,—an opportunity for accomplishing things that cannot be accomplished in any other way. Here are the shaking and vibration movements. If you get tired, go down there and try the vibrating chair, and see how wonderfully it will rest you.

Here are some suggestions which are well worth your while to read. Look them over carefully, and the rules for exercise. Here is a list of hydriatic applications. It is a good thing to look that over. We have classes for teaching and giving instruction in these different methods, so you can use them at home, many of them. And we have a system of coefficients by which we are able to measure the patient exactly, indicated mathematically, then measure the progress you are making. We haven't time to go over all these, but simply give you a glance at them here, so you can see with what precision it is possible to size up the body, and to measure the condition of the stomach and the intestinal work and the brain and nerves, and all of the different vital functions of the body. There are twenty-eight coefficients of the urine that we are able to determine, and they have all been worked out with scientific accuracy in the laboratories of Europe and America. Here is the coefficient card of vital development. This is obtained by means of the dynamometer. After you have had your strength tested, be sure to get it tested again. I met a gentleman the other day who was just about to go away, and he had made a marvelous gain in the strength, more than 2000 pounds, and he could hardly believe it possible. (We want life—the same sort that is painted on the roses and the lily. We can not get all of it, but we should get as much as we can. Let us
reach after the maximum and not be satisfied with the minimum; for by and by the
time will come when the vital forces are spent, and we will see our days are num-
bered; and we can every one of us look back and see where we have had opportuni-
ties for adding to our days, to our fund of vigor and vitality that might have
carried us on days and months and years,—how those opportunities have been lost.
Now, the opportunities are here; they are ours; let us lay in as large a capital
of health, strength, and vigor as Providence will permit us.

v-6-24-9.
I am sorry I did not have the pleasure of meeting with you last week. Business called me away. I had the pleasure of attending the meeting of the American Medical Association at Atlantic City, the greatest medical association in the world, the largest organization of professional men, I suppose, that ever existed in the history of the world, numbering, I believe, about forty thousand. These gatherings are held every year, where doctors exchange ideas and announce their new discoveries, and receive mutual profit from their intercourse together.

One of the interesting things brought forward this year was the final proof, I think conclusive proof, of the contagiousness of cancer, of the fact that cancer is a parasitic disease, and that it is infectious. It has been proven by experiments that rats can catch cancer from one another. Rats are susceptible to cancer; they are quite susceptible, almost as susceptible as human beings are. The experiment was made of putting a rat that had cancer in with rats that were healthy, and afterwards removing it, after leaving it there for a while, and the rats that were put in there, that were formerly healthy, became cancerous. Another experiment that was reported some time ago was this: A cancerous rat was put into a cage, then after a time removed from the cage and healthy rats were put into the same cage, and they contracted cancer.
Personally, I have been for twenty years convinced that cancer was a parasitic disease. There were some peculiarities of the disease that convince me of that. One is the fact that in England cancer is largely confined to certain little areas in certain counties; in England cancer is almost confined to those small areas; the greater part of the cases of cancer in England come from those particular areas; and those small areas have widened each year and are a little larger and a little larger. (Another observation has been made by a number of physicians that in certain countries cancer does not exist. For example, in India it is not very common. It occurs occasionally in India, but rather uncommonly. In Mexico it is almost entirely unknown; and on the east coast of Africa it is practically unknown. Dr. Senn, who traveled along the east coast of Africa some years ago, observed that cancer and appendicitis were unknown; and he attributed this to the fact that the people of that country are still living the simply life. They wear very little clothing; they live outdoors; their habits are simple; they live upon the natural products of the earth, upon the fruitage of the forest, so their diet is very simple, and the blood is pure and clean, and the resistance of their bodies is high.) (It has been suspected for a long time that meat eating had something to do with cancer, and I think it is pretty well proven now that this disease is a disease to which people who eat meat are particularly prone. I have been observing this matter for a good many years. I am not so very old, but for thirty-five years I have been making observations upon this subject, and I have never seen but two cases of cancer in vegetarians. In persons who have lived upon an absolutely non-flesh dietary, I have only seen two cases, and both of these persons recovered. Both of them were suffering from cancer of the most pronounced type, one an epithelioma, and the other a sarcoma. The sarcoma was in the eye, or the eyelid. It was removed from the eye lid and reappeared upon the side of the face just at
this point (illustrating), just in front of the ear; and a large lump, as large as the end of my thumb appeared here, a genuine melanotic sarcoma, one of the most virulent types of malignant disease. This was removed. When I removed it, I expected certainly it would return, but this was now two years ago, and not the slightest symptom of return—more than two years ago, so I conclude that this patient is probably cured. And the other case was a case of cancer upon the neck, and this case recovered spontaneously. The patient observed that he had an ugly sore. It did not heal, did not yield to any remedies that were applied. He finally became alarmed. He was a meat eater, and he stopped the use of meat, and went to living outdoors, sleeping outdoors, taking care of his health generally. He was a sedentary man, a bookkeeper, but he gave more attention to health than he formerly did, and he improved in health, and the cancer disappeared. I removed a portion of the cancer for examination, and it was unquestionably cancer. When I found the patient had recovered, it surprised me very much. He got well. I expected to perform an operation upon him, made an appointment for him to come to the operating room so I could operate upon him; and when he came up he said his cancer was cured. And sure enough, when I examined it, I found the cancer had disappeared; so you see he cheated me out of an operation. I had some doubts about its being cancer, and so I sent some portion of the specimen I had removed to New York and had it examined by one of the most eminent pathologists in the United States, and he said, this is certainly cancer; there is no question about it—commonly known as skin cancer, or epithelioma.

I am going to talk to you tonight about vital coefficients. How much would a man give to know exactly how he stands? If you have an engine that needs repair and you send it to the repair shop, it is examined, and you will be
told just exactly what condition it is in. It is taken apart and examined, and its strength may be tested so you will know just how much horsepower of energy it can put forth. But the human body—if we could only measure it. This is a question that began to interest me when I began the practice of medicine some thirty-five years ago nearly, and I worried about it ever since, up to the very present moment. It is a thing that has interested me more than anything else, in medicine,—to be able to measure a man, to know exactly how he stands, so that when the patient says to the doctor here, "Doctor, can I get well? Docto-
er, how long do you think I will live? What is the state of my liver? What is the state of my lungs? What is the state of my kidneys? What is the state of my heart?—what is the state of each one of the different organs of my body"? the doctor can give him an intelligent and correct answer. These used to be very puzzling questions, but I am glad to say the time has now come when we can answer those questions with a considerable degree of accuracy, when it is possible to express in mathematical terms a very close approximation of how the man stands vitally. We have various coefficients—those that measure the heart, the lungs, the blood, and various vital organs. One of the most important is the blood, and here is a section from our coefficient card in which we have arranged nearly one hundred coefficients—mathematical expressions of exactly how a man stands. Here is the hemoglobin. Now, the hemoglobin should be 160. When it is less than 160, which is the normal, it is below par. So if it is 99, it is one per cent below the normal. If it is 50 instead of 160, if it is .50 instead of 100; then the man has only half the color of the blood he ought to have—half the coloring matter. (Now, it is the coloring matter that carries the oxygen; so if a person's blood is depreciated, has only one half as much coloring matter as he ought to have in his blood, he is half smothered all
the time. That is the reason why he gets short of breath so easily. That is why an anemic person, a person whose hemoglobin is lacking, is anemic. That is the reason why he gets out of breath so quickly, -- he can not carry oxygen. He can take it into his lungs, but he can not absorb it. The blood has not the red coloring matter with which the oxygen is absorbed; hence can not convey the oxygen to the lungs where it is needed. We have a patient in the house today whose blood is .35 -- one third what it ought to be. We had some time ago a patient whose blood was only .07 -- only seven per cent of what it ought to be. It seemed impossible that he should live at all. I was really very much surprised. As a matter of fact, he had a little less than that; it was scarcely five per cent. He had only 250,000 red cells where he ought to have had five millions.

The color index expresses the quality of the blood. One may have his blood count, the number of red cells, and this expresses the number. That is, if one has five million red cells, then it is 1.00. That is, if one has only 2,500,000 red cells, then it is .450; so you can see just how the person stands in relation to the normal. The white cells should be 7,000.

The alkalinity should be up to a certain mark; below that mark it would be less than one; and so on with all the different elements of the blood. Then there is another quality of the blood, which is exceedingly interesting -- the power of the blood to deal with bacteria, with germs -- germs that are our very worst enemies; yet they can do us no harm so long as we are well. A man never gets sick until after he is ill. As a matter of fact, a person can not take typhoid fever, for example, as long as he has a good, sound stomach. It is the man who can not make gastric juice who has typhoid fever. When typhoid fever invades a community, come in, the water is contaminated, -- not everybody gets the disease; it is only a certain class of people who get it. Certain
ones get it. A man who can digest mushrooms can digest typhoid fever germs.

Typhoid fever germs are anywhere vegetables. Anybody who can digest green pickled olives, or pickled cucumbers, can digest typhoid fever germs. But you may have worn your stomach out with pickles and other things, so that it is not able to deal with them, conveniently; then you are a good subject for typhoid fever germs. There is not a germ that grows but what can be destroyed by gastric juice. The hydrochloric acid of the gastric juice, and the pepsin, eat up typhoid fever germs and all other kinds of germs.) Things can not live in a healthy stomach. I had a patient some time ago who thought he had a lizard in his stomach. In order to convince him I got it out, I had to do a sham operation, to make a scratch on the skin, and show him a young salamander, and he was satisfied. He had got it in his head that he certainly had a lizard in the stomach. But lizards can not live in the stomach. You know some of you, by experience; you have made the experiment. I saw a man in New York some time ago actually swallow a live thing. It was an oyster on the half shell. Did any of you ever make that experiment? An oyster can not live in the stomach. If the oysters could live in the stomach, you would not be so ready to swallow them. (I remember a lady who came here some years ago who knew she had a lizard in her stomach; she could not get the idea out of her head. I said finally, "we will starve it out." After a day or two, she came down and wanted something to eat. I said, "What will you have?" She said, "Well, I would like a few oysters." I said, "how would you like them?" Of course, I didn't intend to let her have any, but I thought I would have a little chat with her any way. I said, "Do you want canned, or stewed oysters, or what sort of oysters?" "Oh," she says, "I want them alive, on the half shell." I was shocked, and I said, "I can not believe it; here you want a live oyster!
You are scared to death because you think you have a lizard in your stomach, and here you are going to swallow some more live beasts!" Just think of it! People don't think they are swallowing beasts when they swallow oysters. Just think that when you are swallowing an oyster, you are swallowing its mouth, stomach, liver, small-intestine, large intestine, kidneys, and all the rest of the animal--swallowing the whole beast; it is the entire animal going down,--alive and kicking too. Well, she didn't want any oysters, and after while we got rid of the lizard too.) (But the stomach digests anything that goes into it that is digestible, whether alive or dead. The stomach kills it if it is alive. So typhoid fever germs need have no terror for a person who has got a good, sound stomach. Prof. Brieger demonstrated that a good many years ago when Prof. Koch discovered his comma bacillus. Prof. Brieger did not believe in it. He said, "This comma bacillus is not the real cause of cholera, and I will demonstrate it." So he took some cholera germs, some of the bacilli, and cultivated them in some beef tea--that is the best thing in the world for the germs to grow in,--and he swallowed a pint of beef tea full of cholera germs, and it did not do him the least bit of harm; so he made all sorts of sport of Prof. Koch; but it wasn't very long before he had to change his mind; because one of his assistants in the laboratory got hold of some of that same beef tea, and it gave him an awful attack of cholera. The difference was, Prof. Brieger had gastric juice enough to destroy all those germs. So you see it is a very important thing to know where you stand. It is not simply the stomach, however, that fights germs; but it is the blood that fights germs.) It is possible to test the blood, and to determine the condition of the blood as regards its ability for destroying or fighting these different germs; and this is done by determining the presence or absence of opsonins.
Each particular germ has an opsonin. The opsonin is a curious thing—a sort of condiment. It is a thing which is absorbed by the germ and makes it palatable, so the white-blood-cells pursue it. It is a sort of appetiser, and when the opsonins in the blood are absorbed by the germ, then the white blood-cells have a great relish for those germs, lay hold of them and devour them with great avidity, whereas if the opsonin is not there, and the germ is, but can not absorb this particular substance, then the white cells pass right by them and pay no attention to them. A person may have tuberculosis, for example, because he did not have opsonins in his blood to enable his white-cells to eat up the tubercle germs that get in; so they were able to grow there and multiply until they have colonized in the body, and mischiefs were developed to a fatal degree.

Now, when one is examined for his tuberculo-opsonic index, as it is called, he may find it too high or too low. If the disease is active and making progress, it is likely to be too low; but if the body is making a great fight against it, then the opsonic index will be high. If it is high all the time, continuously high, it may be an indication there that the person has tuberculosis very bad, or else that he is proof against it. (Some doctors have imagined that a person must eat a great deal of meat in order to get the tuberculo-opsonic index high and to keep it up. It has been urged as an argument in favor of flesh eating that it is necessary in order to maintain the blood in good fighting conditions; so I thought some time ago it would be interesting to make an examination of a lot of our people here that have been flesh abstainers for a long time, to see how the opsonic index stood with reference to tuberculosis. And I took much satisfaction in the discovery that those who had been abstainers from flesh for the longest time had the highest index. Personally I have abstained from flesh more than forty years. I have not eaten a pound of meat for forty-three years, in fact,—oh, longer than that; it has been indeed about forty-four years
since I discarded flesh meats, and I found my tuberculo-opsonic index was 200. That is, it was just double the ordinary, and we found our flesh im-
abstainers here all had high tuberculo-opsonic indexes; and we know from ob-
ervation that dogs and lions and carnivorous animals, as well as non-flesh-
eating animals are subject to tuberculosis. It is only necessary that they
should be shut up under conditions of sedentary life, that they should be
sedentary and shut up in cages, under adverse conditions, and the resistance is
lowered. That is the reason why so many people are contracting this disease in
modern times—it is because of our house imprisonment. We have come to be
cave dwellers again in these recent times. Our houses are made so tight the
sunlight can not get in, and the air can not get in; and we suffer from this
confinement until our resistance is low down, and we become subject to tuber-
culosiis, which is distinctly a house disease. The ordinary person who gets
tuberculosis, if, as soon as he gets it, he would simply go outdoors and stay
there, would get well. That is the secret of the treatment of tuberculosis.
The outdoor life is the natural life, and the vital resistance is so raised
and improved that the person has a chance to recover. Here is pneumonia, and
typhoid fever, and pus| infection of various sorts—diphtheria, and the colon
bacillus; colon infection—all of these different forms of infection may be
tested to ascertain the condition of the individual's resistance; and it may
be determined whether or not the person is able to resist them; and it is a
good thing to know.

A person comes along sometimes and says, "Doctor, my mother died of
tuberculosis; do you think I will? Do you think I will get it? Am I likely
to die of it?" It is a very easy, and a very fortunate thing too, to take
that person's tuberculo-opsonic index, and find what it is, whether it is nor-
mal, or not, and if it is not normal, to tell him how he can bring it up; how
he can cultivate the tuberculo-opsonic index and raise it up by a proper sort
of life. That will mean a simple life, a wholesome life, a life that will
produce clean blood and build up the whole vital resistance.

Now, we have a coefficient of blood-pressure, the systolic and the diastolic, the mean, and the cardiac endurance. The ordinary blood-pressure we talk about is the systolic. That is the blood-pressure which exists while the heart is beating. Just as the heart makes its beat, it forces the blood into the arteries, and the maximum pressure produced is the systolic pressure. The diastolic pressure is the pressure between the beats, and the mean is the average between the two; and the cardiac endurance is determined by making a person exercise, then taking the blood-pressure afterwards. If the blood-pressure remains high and rises with the exercise, that is evidence of good, strong heart; but if the blood-pressure falls with exercise, that means a weak heart. That is the reason why some people get swelling of the ankles, and get out of breath when they exercise, because the heart is not able to do the work; and this is a means of determining to what degree that weakness exists.

Then we have coefficient cards relating to digestion. Here is the salivary coefficient—quantitative, that is, whether a person produces the proper amount of saliva; and the quality of the saliva, and the salivary activity,—all of these are tests which are of importance and determine whether the salivary glands are doing their duty or not. Then there are the gastric tests. We have eleven coefficients you see. The coefficient of solution shows the power of the gastric juice to dissolve the food. Motility is the power of the stomach to empty itself. Carbohydrate digestion—that is the digestion of starch in the stomach. Protein digestion, means the digestion of proteins in the stomach; pepsin coefficient is the amount of pepsin; rennin—that is the milk coagulating element; hydrochloric acid—the amount of free hydrochloric acid, and the amount of hydrochloric acid secretion. This is the amount of chlorin that is formed,
and this is the amount of free hydrochloric acid. Fatty acids, the result of free fermentation, bacteria, and the stomach's capacity, the size of the stomach—all of these are points which can be mathematically and accurately determined.

Then the intestinal coefficients—the motility, the length of time required for food to pass from the mouth through the alimentary canal. The disintegration of food—that is the solution, the dissolving of the food in the intestine; the digestion of carbohydrates, digestion of proteins, then the gastric digestion; these all are determined by examination of the fecal remains of digestion. Besides, there is the pancreatic digestion, and the bacteria of the fecal contents—the contents of the intestine. These all may be determined with mathematical accuracy. And the facts which we elicit by these examinations are of immense value. The psychic reaction is a very interesting reaction. Then we have pain reaction, tactile reaction, thermal reaction, reaction to temperature. That is, we can ascertain how long it takes a man to think, how long it takes him to feel, for example, how long it takes him to see different colors, to distinguish colors, to distinguish figures and letters and things of that kind, and how long to distinguish sounds. All of these points can be determined with great exactness; and this method has been used with a great deal of practical interest in testing the effects of alcohol, and the effects of tobacco, and it is found the effects of alcohol and tobacco are to lessen the susceptibility, and the acuteness of all the senses.

The urinary coefficients are of great importance. There are twenty-eight of them in all. Instead of making examination of the urine to determine whether there is sugar or albumin there, or for casts, and then rest, we have twenty-eight important facts which may be determined through the examination of the urine, every one of which has a very important bearing upon the person's present and future welfare. We won't stop with all these. I might mention that one of the most important is the determination of the presence of the
absence of intestinal auto-intoxication. When intestinal auto-intoxication exists, the poisons which are absorbed through the intestine are carried off through the kidneys, and the examination of the urine will indicate the extent of this. The physical chart is interesting. I hope you have all had your charts made out. If you have not, here is an opportunity to have something done that you are not likely to get elsewhere,—to find your total strength,—what is the strength of the entire body. When I began to prescribe exercises for individuals thirty-five years ago, I found it a very difficult problem. Suppose we have here a man who is a big, strong looking man, and another man that is not half as big. How much exercise does each one require? The small man may be able to do four times as much work as the large man. The size of the man and the appearance of the man have nothing at all to do with his working ability. It is different with healthy people, of course, with with invalids it is an exceedingly important question to know how to prescribe exercise. I found there were no instruments in existence which would make it possible to make this prescription accurately; and I worked for ten or fifteen years trying to devise an instrument, and finally succeeded in devising what we call our Universal Dynamometer, and this instrument has been in use now I think about fifteen years, since I perfected it; it has been adopted by the United States government, and is found in the naval academy. Every young man who enters the navy has to be tested by this dynamometer. Every young man who enters the United States army has to be tested by this dynamometer, and a chart is made, such as you see here; and these machines are in use at Annapolis, and West Point, and even in the Philippines. A little while ago we had an order from the United States government to make a dynamometer to be sent down to the Philippines for them to test the Filipinos who come into the military school to be trained there. I only mention this so you will see that it is recognized as an instru-
ment of scientific precision, and it is the only instrument of the sort in the
world which will do this; and by means of these tests, you know the strength of
every particular group of muscles in the body--arms, legs, trunk, and these are added together so you know the strength of the legs and arms to-
gether, and of the trunk and arms together, and the trunk and legs together;
the strength of the breathing muscles; and there you have a chart of the body, a
picture. This line shows the strength of the person when he came, and this
zigzag line indicates the variation of these groups from the normal. Here
is the normal here; but this group here, for instance, these left hand extensors,
the muscles which extend the fingers of the hand,--these muscles are up to normal,
both the right hand and the left hand; but these muscles are away down below the
normal. These are the right and left hand flexors--the muscles which shut the
hand. They are feeble, but the muscles which extend the hand are stronger, and
they are a little above the normal; so then this person knows those are the
muscles he must exercise and develop; and the same thing all along here--these
muscles of the trunk and legs,--see how very weak they are. The muscles of the
trunk are very weak also. This person had had some arm exercise but not very
much leg exercise; he needed walking exercises to strengthen those weak muscles.
But notice that gain. In the course of a month, probably, the strength was
increased very materially. Many of these went away up beyond the normal, nearly
double the normal; and the total strength was very greatly increased. The total
strength was increased from 1200 up to 4200. That was quite a gain wasn’t it,
considerably more than doubled.

This is the coefficient, you see. This tells whether the person has
the proper weight for his height or not, whether he has the proper strength
for his height; whether he has the proper strength for his weight; whether he
is able to breathe as much as he ought to for a person of his height; whether
the lungs have the proper capacity, and so on through all of these various coefficients. They are all important to show a person how he stands in relation to the normal person of the same height.

Another series of studies has been carried on here which has brought out some very interesting facts. Prof. Chittenden, a few years ago, made a lot of experiments on soldiers to ascertain the amount of protein—that is the element represented by meat, by gluten, such food as eggs, the white of eggs,—how much of this was really necessary, and he found the amount as ordinarily taken was three times as much as really required. He found it is not necessary to eat meat or eggs at all. Really ordinary vegetable food like bread, potatoes even, and rice—ordinary foodstuffs contain all the protein we need; we don't need to add either milk, or eggs, or meat; in other words, that the products of the earth, which were originally designed for our sustenance contain an ample supply of all the elements needed to repair and to develop our bodies, and to give them all the energy they need. So it is apparent that people who eat very largely of meat and eggs, and foods of that kind, are taking three times as much of that particular element as they require, and great harm results from it. This portion of protein which is not needed undergoes decay in the body, putrefaction takes place, and these poisons are absorbed into the blood and become the real cause of autointoxication. There is, unfortunately, an improper idea that meat is very necessary to sustain strength, and that a person can not possibly be strong, can not do hard work, mental or physical, without eating meat. This idea is very deep seated; it is hard to root out; but it is gradually losing its hold, and there are coming forward plenty of people who have demonstrated by endurance tests of various sorts, that it is not necessary for one to eat meat or to take this great excess of protein which is customarily eaten. (We have made some interesting tests upon one hundred people in the study of the urine, 100 people who are on a low protein diet, ...
who are on the very diet recommended by Prof. Chittenden, that is, as regards the proportion of protein, and the results of this examination are put down here as compared with the results of the examination of urine of people living upon the ordinary diet; and it is very important to notice this. The quantity, for example, is found to be one thousand, in the case of the low protein people, the flesh abstainers, as compared with 1430 of those who use flesh freely—the ordinary mixed diet. This is what is put down in the text-books as a standard. You see, that means a saving of nearly one half of the work required of the kidneys. Now we come down to this—acidity; and the flesh eater has an acidity of 2.2, while the non-flesh eater has an acidity of .9, or less than one; so the flesh eater has acidity twice as great, because of the amount of uric acid in it. Then here is the total nitrogen which represents the poisonous wastes of the body that come from meat, from the wasting of the tissues, the poisonous wastes; those are all really intense poisons, and are included under the total nitrogen; and you see what it is. In the flesh eater it is 16, and in the non-flesh eater it is 6, and a fraction over—less than half more. Now you see, in other words, that the flesh eater has to do, the work the kidneys have to do in eliminating poisons nearly three times as much work, 2.5 times as much work as the non-flesh eater has to do. (That means a saving of all that work for the kidneys, you see. When one’s kidneys wear out, he dies. One can lose an eye, or an ear, or a nose, or an arm, or a leg or both arms or both legs, and live, he can lose all four limbs and live; he can lose one kidney and live, but he cannot lose one and a half kidneys and live. One can live on two thirds of a kidney. We have a surplus of kidney power; but when we lose more than that, we die. The kidney does not disappear by quarters or halves in that way; but all through the kidney the little parts that are at work gradually grow old, disintegrate with advancing years, by reason of the extraordinary amount of work;
and that is the reason they undergo decay. Now, kidneys that are required to do 
2\frac{3}{4} the amount of work they ought to do, all the time, will wear out. Urea is 
the principal element eliminated by the kidneys, and here it is three times as 
much in the meat eater as in the non meat eater,—in the flesh abstainer. Why? 
Because the urea is very largely derived from the meat itself; so you see the 
kidneys have an enormous amount of extra work to do --nearly three times as much 
work as they ought to be required to do.

Here is the same thing again. The ammonia is one of the very poison-
ous elements that is produced in the body of meat eaters. The meat eater is 
producing nearly four times as much ammonia, and it is produced as an antidote; 
it is a very poisonous substance itself in the body, poisonous to the tissues, 
but its purpose is to antidote the excess of acid which is produced in the 
body. Here again you see the same condition. Creatinin, the poison derived 
from the muscles breaking down, of muscle tissue, and of course when one eats 
dead muscles from another animal, there is bound to be a great deal more crea-
tinin than otherwise; then one has to deal with that creatinin produced by 
another body besides his own body--twice as much. Here is another thing--
chlorides 10. That is not a poisonous substance, but means the meat eater 
eats more of the chloride than our flesh abstainers are in the habit of eating. 
The phosphates are less than half as much, you see, or about two \frac{2}{3} fifths 
as much. Here are the total sulphates. This is, of course, poisonous sulphates 
derived from decomposition of protein substances in the intestine--three times 
as much of this. The ethereal sulphates, entirely derived from putrefaction 
in the intestines, are nearly double, you see. Here is the same thing again--
three times as much. So we have in indican 77 instead of 25. Indican is the 
result of putrefaction, and this is 77 instead of 5—more than fifteen times 
as much of these toxic substances derived from the putrefaction of protein sub-
stances in the intestine.

So, taking it altogether, the kidneys of a flesh eating man have to do more than double, I can freely say at least two and a half times as much work as is required of the kidneys of the flesh abstainer. Isn't that worth while for a person to think about? That is especially important for the man to think about who has been a smoker. The man that has used tobacco for fifteen or twenty years, or forty years, or all his life, and has just found his kidneys are damaged, had better take care of them the best he knows how, because they are damaged, and he is going to die of Bright's disease one of these days, or of something else that results from an inefficient kidney. A person who has been accustomed to use tea and coffee freely and has a crippled liver and has damaged kidneys and damaged blood vessels, must certainly die earlier than he ought to die. The evil day can be postponed by taking the greatest possible care to give the kidneys, liver, and these other eliminative organs just as easy a time as possible to require no extraordinary work of them.

I said a little while ago that endurance tests had been made by which statements the **xxx** I have been making to you here have been confirmed. Some four years ago last fall there came here one of the most interesting men I ever met in my life, and I think a man who impressed me more profoundly than any person I ever encountered in my life,—Prof. Fisher, the head of the political science department of Yale University. Prof. Fisher impressed me in the first place because I discovered that he was an extremely earnest seeker after truth. And if you could show him the truth, he did not care how much it disagreed with everything he believed, he would accept it right away, if you only gave him the proof. But he demanded the absolute proof. Simple guesswork would not do; simple surmise, presume, perhaps would not go with him at all; he had to have the absolute, indubitable proof that nothing could upset. He came here something of an
invalid. He had been an invalid for a number of years and had partly recovered, but had not recovered so as to enable him to do his regular work. He was doing partial work, but could not do full work as he wanted to; and he felt he was like a bird with its wings clipped; he had great things he wanted to do and accomplish, but his physical capacity was so limited he was simply shorn of his strength. When he came here, he saw what was being done here, he became very much interested in Battle Creek ideas. He went home after a short visit, began to carry them out, and he made such wonderful gains and improvement that he came again and stayed longer, brought his family; they all became converts to Battle Creek ideas; and four years, having been living in harmony with the principles, and eating as you see us eat at the table upstairs; eating as you eat here, according to Sanitarium methods, and he has made such wonderful improvement in a year or two, that he became very much of an enthusiast, and he came here and said, "Doctor, I want to make some tests that will demonstrate beyond any possibility of doubt, the value of these methods and these principles,—that is, if they are as valuable as they seem to be"; and he said, "I propose to make some endurance tests, and I want to test your people here; I want to test you, and I want to test the doctors here, and the nurses, a lot of them. Then I will go back to Yale, and I am going to test the athletes there, the strongest men we have got,—submit them to the strongest tests; and I want to see which comes out ahead." I said, "Why, Professor, that wouldn't be fair at all. We haven't had any training; we are not athletes; it is not fair to hold us up with the athletes, with your strong men that are in training for tremendous exertion; it wouldn't be fair at all." He said, "Well, suppose we should make those tests and your people here who are non-flesh eaters, having all this tremendous handicap against them, should come out ahead, then how would it be?" I said, "I am sure they would not; I don't think it is a fair test." He said, "If you will allow me, I am going to make the test anyhow, for I believe
you will come out ahead, for I believe endurance is a very different thing from strength; I am satisfied it is and I want to prove it." I talked it over with him, at any rate could not object to it; thought it would be worth while to make the test anyhow. So the Professor tested 32 of the persons who are living here on a low protein diet; 32 flesh abstainers were tested. Two of these were at Yale; 30 were here and the other two at Yale. Then he tested at Yale 15 high protein subjects. Those 15 men were all of them athletes, every one of them, and they were in training for important athletic events. They were men in rowing matches, were in training to win prizes in intercollegiate events, and wrestling matches and running matches; they were all of them trained athletes, powerful men,—the best men at Yale. Now, then, look at the results here.

Now, I must tell you what the test was. One of these tests was to hold the arms out until they dropped down below the level, until they could keep them up to the level not a minute longer, until they just came down. It took a great deal of will power to do it; but our men were tested first. They had no models, no standards before them; so when the first man held his arms out fifteen minutes, he thought he had done a great thing, for he had heard that no one could hold his arms out more than five or ten minutes. He thought he had done a great thing, and gave up. The next man thought he had done a wonderful thing when he held his arms out thirty minutes; and they gained one on the other until the last man held his arms out three hours and twenty minutes straight, and the average for the whole was more than 50 minutes. After the Professor had made these tests, he went down to Yale and said to his athletes there, "Now, then, you see what the Battle Creek men have done. They don't eat meat and you do; you have to have great, big beefsteaks three times a day,—your training crew, and up there they eat none at all. Now, we want you to do better than this." So
they held out their arms and he sat right there to encourage them. When one
of his great athletes, a wrestler, had held his arms out five or six minutes,
they began to shake and tremble, and the Professor said, "Hold them out, hold
them out; don't give up yet. Why, the Battle Creek men are away ahead of you.
Keep your arms out. Do your best." And the poor fellow at the end of ten
minutes simply fainted away, many fell over on the floor and had to be carried
off. He did his best, but could not possibly do it; so these men were encour-
gaged to do their very best; and you will see the results. The average of the
Battle Creek men was more than fifty minutes, and the average for the Yale men
was ten minutes. The average of fifteen of those powerful men was only ten
minutes. Now, see a little more. The maximum of our men was 200 minutes,
that is, three hours and twenty minutes; and the maximum at Yale, of the best
athlete they had, was 22 minutes. There wasn't a man who went over 22 minutes.
That was the best the strongest man they could get at Yale University could do.
That man was a man fifty years of age. It was not myself, but a colleague of
mine who happened to be here then, and who was fifty years of age. He had never
had any athletic training in his life; he has been a sedentary man all his life
time—never had any athletic training, yet held his arms out three hours and
twenty minutes. I think some of the others could have done the same if they
had only thought so, but they thought they had done well enough when they held
their arms out as long as they did, and so they let them down. Prof. Fisher
testified that this man could have held his arms out half an hour more, but he
had got so far beyond the record that he thought it was not worth while. He
went right on about his work the next day; but some of these Yale athletes were
actually crippled, so that some of them were laid up in bed for ten days. After
he had been making his tests for a few days, he could not get any more candi-
dates, because they were so crippled, they were afraid they would drop out of
the training crews.
The number of low protein subjects who exceeded 15 minutes was 22. Of the high protein subjects, meat eaters, it was only two. Those who exceeded thirty minutes, there were fifteen of our men, and none whatever of the Yale men. This is a very interesting story. The total number of minutes' work done by fifteen of these low protein subjects, thirteen of our men was 1336, and of the Yale men 150. Fifteen Yale men only held their arms out 150 minutes, and thirteen of our men held their arms out 1336 minutes. That is nine times as much. That means something, my friends, such a test as that. It means that our nurses and doctors here, sedentary men who haven't strength enough to defeat any of those men in a wrestling match or a rowing match or anything of that sort—a running match, when it comes to a test of endurance, they were ten times as good as these men. It does not take any strength to hold the arms out, but it requires endurance to keep it out. See the results with another test.

Here is the next test. Deep knee bending, the test of putting the hands on the hips, sitting down to the heels, and up again, once in two seconds, until you could not rise again. That is the test, go down and up in two seconds until it is impossible to rise once more. Prof. Fisher's men, a man who was a sprinter, made this test, and went as far as he possibly could, and finally fell over. He is the man that reached one thousand. Now, of our low protein men, six of them reached a thousand; of the Yale men, only one reached a thousand, and this man fell over on the floor, and had to be helped down stairs; he could not walk. And he was not able to go about for a couple of weeks. Now, one of our men went 2400, and he went right on about his business, went down stairs when the test was over, took a swim in the stimulating pool, and the next day was going right on about his business just the same as usual. That is the difference. Now, see the difference. Nine of these low protein men
made this deep knee-band 12,000 times. The Yale men made it only 3000 times. Our men did four times as much work as those men who were sprinters and wrestlers,—powerful athletes. Later, one of our men carried the number up to 5002 times, dips, continuously, and he was not at all injured by it, but went right on about his work the next day just the same as ever. I saw this young man about the institution just a day or two ago. Now, I will present the results of these tests to you so you will see it is not dangerous to adopt this low protein dietary.

Some of you wonder, I suppose, whether it is not dangerous to forego your beefsteaks, mutton chops, and these other things. This table here shows you what happens to men who have been foregoing flesh meats of all kinds for years, anywhere from five years to ten years, twenty, thirty and forty years, and have suffered no harm in consequence of it.

Now, the examination of the blood of a thousand persons taken consecutively,—we have made over 30,000 examinations of the blood, taking a thousand of these just as they come, and we found the average is 3,885,000 before treatment, and after they have been under treatment a while, 4,359,000—a gain of 12%, and that gain was made without any beefsteak, without any beef broth or beef juice,—examination of a thousand patients taken just as they come. They gained 12% in blood, that is, the red cells. Now, the hemoglobin is 73% at the beginning, and later they gained 15%. In thirty cases of anemia, bad cases,—the average when they came was 1,889,000, and later, after treatment, 3,140,000, a gain of more than half, 55%, without any meat or flesh of any sort, but on a low protein diet. The hemoglobin was 47% before, and 67% after,—a gain of 20%; so you see the idea that meat is necessary, and blood is necessary, and beef juice and beef tea, etc., that these things are necessary as a means of blood-making is entirely an error. How these errors have originated, it is
difficult to understand. Somehow or other we have fallen into the idea that we must eat blood in order to get blood; that we must eat flesh in order to gain flesh; that we must eat a strong animal in order to get strength. These are old superstitions, hearded superstitions that we would do well to cast off.

The source of energy is the sun, and the sunlight is stored up in the products of the earth, in plants of various sorts. We will talk about this at another time, as I see it is getting late; so the important thing is for us to get back to nature, and to get our foodstuffs in the original form in which they are made for us by nature, in which they are intended for our use. I will tell you about this another time.

This shows why it is that a meat diet destroys strength and endurance instead of adding to it. It is because meat always is ready to undergo decay; it always contains bacteria, and this is the result of our laboratory investigations—of ordinary meats, just as they are found in the market. Here they are: when purchased, a portion of beef which weighed one fourth dram, a gram, a little piece about as big as the end of your thumb—a gram is one fourth of a dram; it takes four grams to make a dram,—a little less than that; but one of these small quantities contains 420,000,000 germs. Now, just think of it! That is just as you find it in market. That is sausage, large sausage; small sausage had still more—663 millions. Round steak had 560 millions, that is when the round steak is brought from the market; but at the end of twenty hours, it had 640 millions, doubling on our hands, you see. Roast beef had 260 millions; at the end of twenty hours, 750 millions. Smoked ham had 43 millions; at the end of twenty hours, 750 millions. Hamburger steak had 129 millions; at the end of 20 hours 700 millions. Pork had 126 millions, and at the end of twenty hours, 1036 millions,—more than a billion bacteria in a quarter of a dram.

Multiply it by thirty and it will show you how many there are in an ounce of
that meat. That would give us thirty billion as the number of bacteria in the one ounce of that pork.

Here is sirloin steak, well done, cooked already to serve on the table from the kitchen at one of the hotels in the city. It happened that the chef of that hotel was taking some studies in chemistry in our laboratory here, so he volunteered to bring along some foods he had already prepared for the table; so this was sirloin steak prepared for the table at the Post Tavern; and instead of being served at the Post Tavern, was brought up here, examined in our laboratory, and it was found to contain 25 million germs in a quarter of a dram; thirty times that much in an ounce, or 750 millions of bacteria in an ounce of it, and it is just as good as any beefsteak you can find anywhere. This is not saying anything against Post Tavern. It is just as good as any other steak. That is when it is well done. But being cooked rare, it has, as you see here, nearly seven times as many, because the heat was not sufficient to destroy the germs. If it is cooked for hours at a high temperature it may destroy the germs, but the spores resist all these temperatures, and require a temperature of 240° for half an hour to kill them, and you do not get that temperature in the interior. So when you swallow meat which comes from the market, it is already decomposing, has the bacteria in it, and the bacteria continues to decay all the way down. If you should find in a neglected corner of the house somewhere a mouse that had been dead a week, already far advanced in decomposition,—suppose you should put it in your pocket and carry it around, and keep it in a warm place, would it sweeten up any? The probability is the germs would continue to grow and the mouse would continue to smell worse and worse and worse and worse, the stenches would multiply with the bacteria. Now then, suppose, instead of a mouse, it is a piece of dead cow, or dead ox, or dead calf or sheep, or dead pig, or any other kind of dead beast, and you find it in the butcher shop undergoing decay; it is the flesh of a beast, an animal, the same as though it was
a dead rat undergoing decay; and you swallow it in that state; you see the same thing would happen down in your colon or in the intestine that would happen in your pocket if you were carrying around a dead rat, or--the same thing.

Now, it is singular that we have to have this thing made so simple in order to really comprehend and appreciate it. But I find that is the only way. We have just got to talk things right out plain, to get people to understand the thing they are doing when they are swallowing a bit of a dead beast--that it is already undergoing decomposition. The potter's field, the cemetery, boneyard or some other place is a more appropriate place for the burial of a dead animal than a human stomach. I didn't invent that picture. I owe that to Charles Lamb. You know he wrote an essay on roast pig, and he told how delightful roast pig was, how enjoyable it was, how luscious, palatable, delicious etc., it was. But finally he confessed it was rather hard on the pig, but, he said, "Then, there is a great compensation to the pig in the fact that he has such a fine sepulchre."

Now, when these poisons are taken into the body in great quantities, they flood the liver, and the liver has for its duty the destroying of these poisons. Here is the portal vein which brings the blood from the stomach, intestines, small and colon, with the germs in it, and the poisons in it, to the liver and distributes the blood through the liver. After it has been distributed through the liver, then it goes back to the hepatic vein here; it goes back to this great vein the vena cava; then it goes up to the heart to be distributed. Now, if the blood is loaded with poisons to an excessive degree, the liver is overwhelmed, can not do its work, and the result is poisons pass on into the circulation, and every tissue in the body is damaged by it. That is the way you get this tinted skin--because some of the coloring matter has escaped and has come there. It has formed by decomposition in the intestine, carried
into the blood and deposited in the skin, and that is what makes those brown spots called liver spots, and the brown circles around the eyes; the blood becomes contaminated so it can not destroy germs, and that is why the germs grow in the mouth, because the saliva loses its power to destroy them or inhibit the growth of germs, to destroy or prevent their development; so the germs grow on the tongue in the mouth, in the colon, in the stomach, through the whole intestine, and are able to grow in the tissues of the kidneys. If you get a little puncture anywhere, it gets sore. If a few germs get under your skin, you get a boil. The germs on your face, perhaps, get down into the sweat glands, into the sebaceous follicles, and you get pimples on the face, acne, eczema and various other skin diseases break out as the result of the lowered vital resistance; and it all comes from the saturation of the body with these poisons which are chiefly produced by the decomposition of undigested flesh foods in the intestine.

(Now, there is a very interesting experiment which I saw made in the laboratory of the famous Pawlow, in St. Petersburg. Prof. Pawlow is perhaps the greatest living physiologist, and when I arrived there, he treated me with a great deal of courtesy, as I happened to be the second American physician who had visited the place in three years; so they gave me very great consideration. He turned the whole laboratory over for my instruction, and one of the interesting things I saw done was this operation. It was not done for my special benefit; perhaps it was done on that particular day for my particular benefit, but it was done for a professor in a medical college that wanted a dog with an Eek fistula; so they improved this opportunity in order to allow me to see the operation done. This consists in connecting the portal vein, that carries the blood through the liver for purification, with the vena cava, the artery which carries the blood to the heart so as to cut it out. This portal vein
was tied so the blood could not get through. Here, you see, was the colon, where the blood was absorbed from the colon, carried to the liver for purification, and this was ligated so the blood could not get through; then the vein was joined to the vena cava here, so that the poisons of the blood went right into the general circulation. That dog got along all right. A dog having this operation performed gets along all right provided they give him the right diet, but if you give the dog that has had this operation arranged made, or this provision, so that the liver no longer purifies the blood of these poisons from the colon, this is when a dog is put in that position he is compelled to live on a vegetarian diet. He can not eat meat any more. Such a dog fed upon meat dies in three days every time, with the poisoning, because the liver can not longer do its work in taking out poisons in which it ordinarily does. Now, you can readily see why a person gets bilious, because he is producing more poison than his liver can destroy. That dog has a big bilious attack and dies.) (A person who has a bilious attack is simply poisoned. A person who has headache, a coated tongue, a bad breath, bad taste in the mouth, is poisoned; the whole body is saturated with poison. I told a lady about that a little while ago; I saw her tongue, got the odor of her breath, which was very offensive indeed, and I said, "Madam, I see you are suffering from auto-intoxication." She said, "Indeed, you are entirely mistaken, sir; I have not touched a drop since night before last." But I must say good night.
Savage can smell and see farther than civilized man....  Country man sees farther than city man.
EVILS OF CIVILIZATION

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Thursday, June 24, 1909, at 8:00 P. M.

by

J. H. Kellogg, M. D.

We are almost civilized to death. We have been so anxious about civilization, we have forgotten all about ourselves. The human race is hurrying, as rapidly as possible, it would almost seem, down the hill of race degeneracy to absolute, certain race extinction unless by some means the tide can be turned the other way. We have either got to make water run up hill, or else we have got to level down the hill in some way. We have got to turn things about. We are on the wrong track. When we look into the situation, we find in this country alone a million and a half people dying every year. Just think of it—a million and a half. We are losing a million and a half out of our population of only 85 or 90 millions, every year—just think of it! In some countries, and in some parts of this country, the death rate exceeds the birth rate. In France for a whole generation, the death rate has been ahead of the birth rate, until the government had to set a premium on babies, and offered prizes for babies and for big families, and offered special favors, special advantages commercially and socially, and civilly at least, for large families; and at last they have gotten up to the point where the birth rate and the death rate are equal; and they are feeling very jubilant about it; but it is only within the last two or three years that that has been true. Now, not only that, but we find most indubitable evidence of the increase of race deterioration and degeneracy year by year in the increase of insanity. Intellectual activity is
the highest manifestation we have of human life. When we find the brain failing in a man, it is evidence that the whole body is failing. The body fights to maintain its functions; it labors to the very last to maintain the integrity of its highest functions. The brain receives more blood than any other organ in the body in proportion to its size. One fifth of all the blood in the body goes through the brain, although it is a small organ. The brain maintains its integrity after every other organ of the body has begun to deteriorate in advancing age. You often find a man of eighty with his brain as clear, his mind as active as it was at forty, while his limbs are withered and his liver and stomach are shriveled, and his heart is small, his arteries beginning to show evidences of hardening, yet his brain is active and vigorous as ever. What a splendid example we had of that in Gladstone, and even in Bismark who was as far away from normal habits of life, perhaps, as a man could well be, almost; Bismark showed wonderful intellectual activity, because the body maintains the integrity of the brain as long as it possibly can. So when we find evidences of mental degeneracy and a marked increase from year to year, it is evidence that the race as a whole is deteriorating, that the physical stamina of the race is certainly depreciating. Now, just see what has happened. In fifty years, insanity has increased 300%. Now that means much, my friends, more than we can possibly comprehend. If it could be proven that insanity had increased 300% in 1000 years, it would be a terrible thing to think of, when we consider the long life of the race, the long ages through which deterioration may go on, for there has been a steady deterioration going on for two thousand years; and if that had amounted to an increase of 300% in 10000 years, in insanity, it would be a most ominous thing. It would mean, if it should go on far enough, that total insanity would be the situation.

But just see what the situation is. With an increase of 300% in 50
years, see what we have before us. It means that at the present time, instead of having between 500 and 600 lunatics to the million, as we had fifty years ago, we now have 1800 to the million; of lunatics, imbeciles, epileptics and idiots put together, we have 3400 to the million at the present time. In 50 years more we should have, at the same rate, 10,000 to the million, and that would be 1%. And in 50 years more it would be 3%; in 50 years more, 9%; in 50 years more 27%; in 50 years more 81%, and in 50 years more, 243%. We could not get so far as that, of course; we would have to stop at about 265 years when we would have 100%; in other words, we would all be lunatics and idiots in 265 years from now—if we don't stop.

Now, there are other evidences of this deterioration. The civilized man has lost his sense of smell almost altogether. The savage has such a keen scent that he can smell,—it is said that some of the South American tribes can be smelled by their neighbors several rods away, even 40 rods away. I was reading an account just the other day of a traveller in Africa who told of certain tribes he encountered there who had an odor about them that even his obtuse sense of smell was able to discover at a distance of several rods away, when the wind was blowing right. But there is something more than that. There is unquestionably a deterioration of the acuteness of sensation. See what a marvelous sense of smell the dog has. His master passes through a crowded street into a crowded lecture hall, and thousands of feet, perhaps, have passed over his tracks, and perhaps on hard pavements where one can make no mark at all, a stone wall or a polished floor,—that dog will follow that almost positively, certainly. And there are certain tribes in Africa that have almost the same keenness of smell.

The savage man can not only smell farther and surer than the ordinary civilized man, but he can see farther. The man who lives in the country has a far keener vision than the city man. Our civilization is causing many of the
population to become blind. The average boy that goes to school gets to be short sighted or far sighted before he leaves school. About 10% of school children have defective sight when they start, but when they get up to high school, some three quarters of them have some deficiencies of the eyes. Some years ago a commission was appointed by the British Government to look into the conditions of the school children, and they found nearly three quarters of all school children were defective in one way or another. Recently there has been a physician in New York who reported at the meeting of the American Medical Association at Atlantic City two weeks ago, that 78% of the school children of New York were found to be defective. Of course, you would not find them so bad as that in the country; but that is the effect of city life. It means deterioration, race destruction, and extinction.

I told you a little while ago of how lunatics are increasing, but the statement I gave you does not come anywhere near the truth. I was talking with the secretary of the state board of charities of Illinois a few months ago upon this very question, and he said, "I have been studying the matter in Illinois. We have 10,000 lunatics in the insane asylums in Illinois, and the Lord only knows how many outside. However, I have been trying to make an estimate of it, and from various data which I have been able to get together, I have become thoroughly satisfied that there are 50,000 lunatics in the state of Illinois, outside of the insane asylums." Now, that is quite possible. I am sure we can see evidences all about us, especially when we have a political campaign, that there are a whole lot of lunatics that haven't got into the insane asylum yet. Of course, I am not going to say which side they are on. I presume there may be some on both sides.

Now, the savage is able to hear better, far better than the civilized man. It is amazing what a great number of people there are in civilized life
whose hearing has become extremely dull, to an extraordinary degree. The sense of taste of the savage is far superior to that of the civilized man. The savage goes into the forest, and he knows as soon as he gets hold of a fruit, any kind of fruit, and touches it to his tongue, whether it is good to eat or not. The civilized man sits down at a hotel table, and has not the slightest idea whether anything on that table is fit to eat or not. He eats it because it is there, because he likes the smell of it and he has become addicted to that particular odor, or because it looks good, or because it has the right sort of French name, perhaps. But the savage knows. The civilized man gets sick afterwards. That man who sits down at the hotel table day after day, day after day, and day after day, lands in the Battle Creek Sanitarium or some other worse place as a consequence of his wrong eating; whereas the savage goes on and lives a long, hardy, vigorous life.

The endurance of the savage is incomparably above that of the civilized man. Some time ago, perhaps you remember, there was a discussion at the Hague Peace Conference, at the first Hague Peace Conference, there was a discussion of the use of dum dum bullets and explosive bullets, ragged bullets—bullets that tear and make great holes—terribly savage things, and most of the nations gathered there agreed to discontinue the use of dum dum bullets in warfare. There was only one nation that would not agree to it, and what was that nation? Christian England! Because she said, "the savages that we have to combat in our colonies have such toughness of constitution, such an enormous amount of vitality that we can not kill them with ordinary bullets," and they told the story of how a savage chief started to charge upon an officer who was 100 feet away when he started his charge. Seven bullets were put through that man, but he didn't stop his charge; he ran his spear through the officer and killed him, then dropped dead himself. Seven bullets were put through his body but none of them stopped him until he had accomplished his purpose.
These savages have terrible wounds and yet recover, because of the extraordinary vitality and vigor of their constitutions. Why, here a civilized man gets a little scratch somewhere, the puncture of a needle it may be, may be a little tear in a nail. A few germs get in under the skin, and pretty soon the arm swells up, the glands enlarge, pus begins to pour out and spreads, gets into the blood and sometimes throughout the whole body, and he dies of blood-poisoning. But it is almost impossible to kill a savage by blood-poisoning. The savage lives on a natural dietary. Captain Sanderson, the great elephant hunter, who used to capture 124 elephants at one time—that is his story at any rate, that he told me himself, so I vouch for the truth of it,—this man in his very interesting book, "Fourteen Years in the Jungle", makes this remark: he says if you wound a lion, no matter where, get your bullet into him most anywhere, he is certain to die from it sooner or later; it may be several weeks later, but he will die; he dies of blood-poisoning. But you may see a bison going along with an enormous great tear, or with several great sores where some lion or leopard has torn him, covered with maggots, and suppurating, but apparently enjoying good health, in good flesh, and it gets well after a time. That is due to the difference in diet. The diet of one fills the blood with impurities, while the diet of the other leaves the blood pure and with all its recuperative power.

But I didn't mean to talk to you so long in this preliminary way. I want to show you some pictures, to call attention to one class of deteriorative influences which are at work among us and which are doing so much to break down the human constitution in civilized life; but the civilized life is not the natural life. The civilized life is far from natural. A North American Indian or a South American monkey placed under the conditions under which most of us life, would die in six months. The health officer of Chicago, Dr. Evans, taught
the people of Chicago a very good lesson last winter. The people of Chicago are dying of tuberculosis at a great rate. There are reckoned to be 6000 or 7000 people dying of tuberculosis in Chicago this minute, between six and seven thousand people dying of tuberculosis in that one city; and 200,000 dying in the United States of that one disease,--200,000 dying this year, 200,000 more next year of that one disease. They had some monkeys over there in Lincoln Park and the monkeys were dying of tuberculosis also. They were taken very great care of to keep warm, kept shut up in the house in winter time, and Dr. Evans went over there and turned those monkeys out of doors, so the poor fellows were shivering, they were cold, and everybody was so sorry for them; but they got well of consumption and no more of them died; so he invited the people to come over there and see the monkeys cured of tuberculosis by an outdoor life.

And man is naturally an outdoor animal. It is just as natural for the man to live outdoors as it is for the monkey to live outdoors. It is a good thing to remember this time of year, for if we get accustomed to living outdoors in the summer, we may be able perhaps to enjoy it in the winter.

We have here a picture of a man of normal human proportions which represents a healthy man, a healthy figure, strong, strong arms, strong limbs, a good, thick chest, large waist. Man unquestionably in a normal condition is the toughest and the hardiest animal on the face of the globe. If he was not, it would not be possible for him to live under the conditions under which he has lived for so many centuries. Man is unquestionably the most perfect animal organism that exists. He is not adapted to some things as well as some other animals. Each animal has its special adaptation, for instance, the turkey buzzard has an enormous liver, but man has not. The dog has a liver four times the capacity of the man. That is the reason why he can live on a diet that man can not live on. If a man undertakes to live on a dog's diet, he gets into trouble, because he has not the necessary liver to take care of it. A dog
can eat pâté de foies gras every day with no trouble, but if a man undertakes to live on that diet, he soon finds himself in difficulty. Here is a savage man, a native of the South Sea Islands. He is not in a very good standing pose, but he has a good waist and a good normal figure,--a handsome chap, isn't he? He lives in the open and has a natural life. Now, here is a little Japanese woman, and although she has considerable drapery around her, gracefully arranged, she has nothing constricting her. She has nothing to bind her body or to in any way deform it.

You see the Chinese woman here has the free use of her limbs and her body in every particular; she has just as good a chance to grow and develop as her husband.

Here is a product of modern civilization. A gentleman came here from Chicago some time ago and brought his wife; she was a young man who had only been married three months. He said to me, "Doctor, I have brought my wife to you. You see what is the matter." I said, "What does she complain of?" He said, "Why, Doctor, don't you see? You can see; she is a wreck; she is a product of modern civilization; that is what is the matter with her." And here is a product. This woman knows she is not beautiful, so she is trying to help herself out. She has some appendages that she applies here and there to try to balance things up; but this woman does not require any such appendages. Notice her natural standing pose, and her natural figure; her dress falls in graceful lines, lines of beauty, without any accessories which you see the other woman has un successfully applied.

Now, I am going to show you a few natural figures here. This is the empire costume in the year 1800, as it was worn. This shows the drapery and shows the figure beneath the drapery. It does not interfere at all with the figure, you see. The little band that supports the garment is here at the
lower end of the sternum where the chest is strong, and where it is not easily compressed. If this band was here below the ribs, then it may easily compress the body and change its shape. The so-called waist line does not exist. There is no such thing as a waist line unless it is created. There is no normal waist line.

Here we have again the empire costume, of 1900, and you see what that has done. Here the body has been deformed. The waist line of the dress is raised, and it gives this body a chance to develop into natural form. Now the consequence of some of these deformities I will show you a little further on, is enormous displacements. Here is a colon which naturally runs across the body here, but by compression of the waist is forced downward. I have in scores of cases, in performing abdominal operations upon women, found the center portion of the colon away down in the pelvis so it had to be lifted out. In scores of cases I have found it so, and you see what must be the natural consequences of this. A flexion is formed here and a flexion formed there, a kink in the colon and a kink is formed here, and there is accumulation, stasis, so there is inactivity of the bowels, stasis, retention of undigested foodstuffs, and putrefaction are the necessary consequences. It could not be otherwise. Here is the same thing. The fecal matters are held back and the cecum becomes enormously enlarged until it lies down upon the rectum and produces incessant tenesmus and auto-intoxication as the result of the too long retained fecal matters here. Here is the same thing again. In this case, the accumulation of fecal matters had stretched this sigmoid flexure until it rose clear up here. This represents a case I encountered some months ago. This patient suffered from most obstinate inactivity of the bowels. In some cases of this sort, I have found it necessary to take the intestine, cut it off here, attach it to the sigmoid flexure here, because the colon had become so absolutely disabled and crippled that it was no longer any use—nothing but a helpless pouch and
unable to perform its functions; so it is necessary to follow the suggestions of Dr. Arbuthnot Lane, of England, and in doing this, I have cut the intestine off and attached it here so as to short-circuit the colon, so to speak, to cut it out so that it was no longer any part of the functional activity of the patient.

Now, I want to call your attention to some normal and some abnormal figures. Here is a normal figure, a natural outline, and shows how the figure expands in breathing. Here is the figure with the ordinary clothing, the waist here. The chest rises and there is a little expansion here, but no expansion here, and the consequence is a forcing down to an abnormal degree of the intestines. This shows the outline with the clothing off and the clothing on. This is with the clothing off and this is the outline with the clothing on. This is a young woman about eighteen years of age, and her mother declared she never wore anything tight in her life, yet she measured four inches less with her clothes on than with them off, and the internal organs were in a terribly de-ranged condition.

Here is a normal figure and an abnormal one, but of the very same persons. This represents the figure of a young lady. We have here an apparatus—I don't know that we have it in use at the present time, but for a number of years I made a special study of outlines, proper figures. I constructed a device by which I could take an outline of a person over a single garment. A person with a tight fitting garment standing against a board, with a large piece of paper on it,—I could quickly make an outline of the body in any plane. That is the outline I made of a young woman who came here, a school teacher, most distressed and wretched and unhappy young woman, pessimistic, dyspeptic, and melancholy, unhappy as she could be, and that was her figure. Now, after this young woman had gone through a course of physical training, that was her figure.
She was simply made strong and well by swimming, by gymnastic exercises and by training; and when she became strong and vigorous so she had this outline, she had an entirely different expression on her face, and had an entirely different view of life. She got well and happy, and is married now, has a little family, and she attributes her recovery entirely to finding out how to be well, how to live so as to be well all the time, to keep well. She has gone through a very severe ordeal since that time, had a sister who died of tuberculosis, and she nursed her and cared for her. She took a regular course of training as a nurse here after she got well, and became a teacher of physical culture. She took care of this tuberculous sister for four or five years while she was slowly dying; did not herself contract the disease. She is herself married and settled down, and has a happy Home.

This is the outline of the Venus di Milo. See that large waist. "Ohmp" you say, "what a huge, enormous waist that is. I wouldn't like such a waist as that"--I can imagine I hear some lady whispering. But suppose you should take the clothes off this fashion plate figure and see how it would look. I want to ask you if you ever saw an undraped figure with a waist of this proportion. I copied this from a fashion magazine, and you see worse things than that in the fashion magazines. It was really an indecent picture. I think it ought to be suppressed by law (applause)--the publication of such pictures as that. They do mischief, because they establish wrong ideals. They are all the time putting into the subconsciousness of women and girls wrong ideals, you see, wrong standards of feminine beauty; so women get to the point where they really think it is almost a heinous thing to have a large waist—almost a disgraceful thing to have a large, normally proportioned waist. Women naturally have larger proportioned waists than men. Women have smaller waists and smaller hearts than men, but women have bigger livers than men, and woman has a larger stomach in proportion to her size than man has; she has a larger liver
a larger stomach, larger kidneys, larger bowels, larger spleen—all the internal organs except the heart and the lungs are larger in women than in men, in proportion to size and weight. Woman has more liver, and less heart, you see. There is good reason for it. A woman's liver must do work for two. The mother's liver must do work for two; so with the other excretory and nutritive organs. The heart is smaller because the fist is smaller and the hand is smaller. The heart is the same size as the fist. If you have got a large fist, you have got a large heart, because the heart backs up the fist in its work. Woman naturally is smaller than man, and her heart is small because she has naturally only about half the strength of man. She has a larger liver than man, and larger stomach and colon, spleen and kidneys—all of which lie right about the waist, so you can see it is natural that woman should have a larger waist in proportion to her size than man has. I hardly believed that when I first saw it stated by Prof. Wiesmann, an eminent German anatomist. He was the first to call attention to that fact. He gave the particulars, the facts, the data which had been collected in the anatomical laboratory, and from examinations which had been made; and a large number of authorities were quoted, so there could be no doubt about the correctness of his statement; but it seemed impossible, and I thought I would verify it. So, as soon as I had opportunity to visit the Corcoran gallery in Washington, Tiffany's in New York, and, travelling abroad, the Louvre at Paris, Luxembourg and other European galleries, I made a great number of measurements. At Tiffany's in New York, I measured the plaster models of a large number of famous statues, and also at the Corcoran gallery; and I got very good measurements also at the Luxembourg and at the Louvre in Paris. And I measured seven typical Venuses, and I found that the average of the seven—and seven typical Apollos—and I found that the seven Venuses had an average of 47.6%—the waist measurement averaged 47.6% of the height. That is the waist measurement of the Venus di Milé. That is just a
little less than half the height. I found on the other hand that the Apollos, the famous ancient Greek statues of men, had a waist measurement of only 45 and a fraction per cent of the height,—2% less than the women. That is, the waist was smaller in men than in women, and that confirms the anatomical observations I mentioned to you a moment ago.

Some twenty or twenty-five years ago I armed myself with a letter from one of the Indian commissioners I happened to be acquainted with, and I went west to study imis ikas Indians. I hunted up a tribe of Indians away down in Yuma, Arizona, that had not come in contact with civilization to any extent at all. They were under the government supervision, but were still a wild tribe living under the old rules and laws and the old-time condition. I found a tribe of Indians living in an absolute state of nature. That means they were imka practically in a state of nudity, as well as in their primitive conditions. The women wore little bark aprons in front and in back, about as big as the palms of your hands, and the men wore something not quite so big as a pocket handkerchief. The boys and girls up to ten or twelve years of age wore nothing any more than the squirrels did, running about, bathing in the streams, playing in the woods and the sunshine, living an absolutely natural life. And I had an opportunity, through the kindness of some Catholic sisters who had started a school there, to become acquainted with the Indians; I had an opportunity to measure a large number of these native men and women, and I was delighted to find the women had exactly the proportions of the Venus di Milo. The Greeks studied anatomy as a foundation for the practice of art, and they knew what a normal figure was. The same thing is true of our modern artists to some extent. I met in Paris an artist who introduced me to his wife. He was a very delightful gentleman, and his wife was a very charming lady. He also introduced me to his model, when I visited his studio. His model was a young woman about eighteen years of age, and she had a figure as perfect as the Venus di Milo,
a magnificent figure. He was painting her torso, and she had a figure of the same proportions as the Venus di Milo—47.6% of the height; but his wife had the proportion of the fashion magazine as near as she could get to it. I said to his model, "Did you ever wear a corset?" "Oh, no, Oh, no." "Why, not?" "Because the artist will not let me." Now, the artist would not permit his model to wear a corset, but I suppose he would not have been willing to appear on the streets with his wife if she had not had a corset on. Think of it!" The model had this sort of a figure outside and this sort of figure inside. There is an inside figure as well as an outside, and people don't always stop to think of that. It is not simply the external contour of the body, but the internal arrangement of things we should be concerned about. Now in xxx xxxxxx notice the position of these important organs. Note how many there are of them,—the liver, the stomach, the spleen, the kidneys, the colon—six important organs. Life may be lost absolutely by disturbance of any one of these. If the liver ceases its function, death results; if the stomach ceases to do its work, death results; if the colon is obstructed, death follows; if the kidneys fail it means death. If the spleen gets to going wrong, it means death. One can die from the disturbance of any of these important organs. You see they all lie above the ribs. You say, "Oh, Dr. Kellogg fixed this diagram to meet his theories." But I had nothing to do with preparing that diagram. I copied it from Ziemssen's anatomy. This was prepared and published by the great German authority on anatomy, and this is his diagram, just exactly as it appears. It was copied photographically. Notice these six important organs are all above the lower border of the ribs. Some of you did not know the stomach was so high up, did you. Why, it comes away up to the fourth rib here. I am not referring to your stomach, remember; it is not your stomach I am talking about, but the normal stomach. That is where it ought to be. A lady said to me the other day,
"Oh, Doctor, I have got such an awful pain in my stomach," and put her hand down here; and on examination, I found her stomach was there, sure enough.

Now note the other side. Here is a woman, not the one who is an extreme devotee of fashion; this is not a woman who has trained her waist down to the very smallest proportions possible. I met a woman some time ago who had that sort of waist, and she had a big lump away down here somewhere, and I thought it was a fibroid tumor. It lay right down here in the middle of the lower part of the abdomen, so I said, "You have got a fibroid tumor; I guess I will have to remove it." She came in to see me a day or two afterwards, and you know that lump was up here, and the next time I saw her it was over there; and I was considerably disturbed about it. I expressed my surprise. She said, "Doctor, there is something more I didn't tell you about my case. I believe I better make a little confession." So she told me that when she was a girl about eighteen, she was at boarding school, and had malaria fever, and her spleen swelled up, and she had a big ague cake, so to speak, and she said, "it mortified me so much because it made my waist so large", and she spoke to her roommate about it, who told her what to do. She said, "The way I do, I lace my corset up very tight, every morning as hard as I can, then at night I draw it up as tight as I can and sleep in it." She said she followed her advice, and for six weeks she did that, and she felt something pop there, and she said, "I have not had any trouble since." The spleen was kicked out of doors, you see, and had the freedom of the abdominal cavity. The liver has actually been known to be cut in two by constriction of the waist.

This woman wore a health corset, and declared she never wore anything tight in her life. But you see it is simply the pull of the skirt bands dragging down. The skirt bands may be loose when they are fastened, but they drag down a little and become tight, and as they become tight, they pull things down. This is an ordinary case. As I said, the woman had never worn a corset, but what
was called—kind of an invention of the devil, I think,—a health corset. It
deludes women into thinking they are doing something perfectly right and proper,
so can not possibly do any harm, because it has health attached to it. By the
way, the words "Good Health" have been disgraced. A man in Grand Rapids manu-
factures good health cigars, and labels them for Battle Creek, and I get let-
ters every now and then asking me if I recommend them. Health corsets belong
to the same class—two evil things.

Notice these two figures. You see the liver, stomach, spleen pancreas, kidneys and the colon are all above the lower border of the ribs, in this healthy figure; and they are all below it more or less in the other figure. The liver is half down below the lower border of the ribs, the spleen is down behind the stomach. That is the situation of things we find people more or less de-
veloped in, not the rare cases of extreme constriction of the waist, but in the
average civilized woman that wears the conventional dress, and is thirty years of
age. I venture to say that there are not forty women in this room, and I doubt
if there are twenty-five women in the whole institution here that are thirty
years of age or more that have not more or less displacement of the stomach,
liver, kidneys or some of these important vital organs, resulting from the wrong
dress. Some time ago a man came to me with a floating kidney. I said, "For
pity sakes, you are a man; what business have you to have a floating kidney? What
is your occupation?" He said, "I am a blacksmith." "How in the world did you
get this floating kidney? You never wore anything tight did you?" "Oh, yes,
I have, Doctor," he said. "You know I am a horse shoer, and I want the free use
of my shoulders, so I throw off my suspenders when I prepare for work, put on my
leather apron and tie the strings around me tight enough to hold the pantaloons
in place." That man got floating kidney in consequence of that. It was just
exactly the same as though he had been a woman and worn a tight corset. I remem-
ber another gentleman we had here, a tall, fine looking, splendid man, a soldier, a colonel in the United States army, and he had a floating kidney. He was very melancholy about it. I said, "Why, Colonel, how in the world did you get that? Did you wear a corset?" "No, Doctor, I didn't wear a corset." I said, "I didn't know but you might, because I know officers sometimes do, especially German officers of the German army, almost all of them wear corsets, and when you see them on the streets, they look as though they were put up in boxes; and they have the appearance of the stiff, ugly appearance of a person with a corset on." I said to him, "How did you get this, Colonel?" He said, "Doctor, I will tell you; this constriction of the waist.—I will tell you how I think I must have got it. Some years ago I had presented to me a splendid sword, and it was very heavy and had a very heavy case, and I had been drill master for a long time; I am especially good at that, and when I am out on parade, why, I wear this sword"; so you see there are various ways in which men as well as women may acquire this deformity. As I said, he was very much depressed about it; it gave him a great deal of pain and inconvenience, and the poor fellow never recovered from it. He stayed with us a few weeks here, got a little better, went back to his home, and a few months later was in such misery and distress that he committed suicide; so that is one of the results of waist constriction.

Many a woman has lost all her interest in life and become most wretched, miserable and unhappy because of the evil consequences resulting from this abnormal mode of dressing. But I must hurry on. There is a whole lot more to tell about it—this weakening of the abdominal muscles, breaking down of the trunk of the body here which supports the viscera, holds them up in place. When these muscles get weak so they can not support the viscera properly, can not support the blood vessels, these internal organs sag down out of place, and the blood-vessels dilate, so that there is a stagnant pool filled with blood that ought
to be circulated through the brain, that ought to be going through the lungs, to be there purified, filtered through the air in a life-giving stream; but it is simply stored up here uselessly, making mischief and trouble instead of giving life and vigor in this relaxed, pendant abdomen.

Here are a few gleanings from a fashion plate—what an awfully hideous picture. When one looks at that kind of picture, he can not help but wonder if that woman has a stomach, and if she has a stomach, where is it? These are simply monstrosities, and they ought to be forced out of existence. How fashion mongers can imagine anybody would enjoy the sight of such a deformity as that is beyond comprehension. They are not any more beautiful than these. They suggest just exactly such types. These are copied from a paper. Now, just try to imagine—there isn’t any room left for the viscera here at all; absolutely no room. Now, women see such pictures and seek to emulate them. Here is a contrast you see, between the Venus di Milo, and a fashion-deformed woman. If the face were taken off and the arms were taken off and one should find that thing somewhere, he never would imagine it had anything to do with a woman or a human being.

Now, this was a costume of Germany in the year 1630; this costume prevailed at that time. This was the mode of dress. Waist constriction is not a new thing by any means; but if we go farther back into ancient Greece, and see the Spartan woman’s dress, there is nothing about this dress that could constrict the waist in any way whatever. The dress is open at this point so you can see the figure, and how absolutely free the dress is; there isn’t any possible constriction or interference with the body’s function in any way.

Here is a picture of that artist’s model I was telling you about. I had forgotten I had it, but I recognize at once a figure of the model I took with
my Kodak twenty years ago in the studio in Paris, of the artist's model, an Italian girl. Look at the strong, fine figure. She had never worn a corset in her life; and she was posing for a picture as you see her here; her picture was being transferred to canvas, her figure, and I took her photograph with the permission of the artist.

I didn't take that photograph. It was sent to me by a friend from South Africa. That is a picture of a congo girl in full dress. She is very particular about her dress too. She would not be seen in public without her beads and wristlets and armlets for anything. These girls are modest girls too. The costume of that country differs. Dress is not needed by the climate, and they live an outdoor, natural life, and the result is a good waist. See what beautiful lines those are too. You don't see any ugly looking corners there, but just beautiful, flowing lines--what beutiful curves. See this curve here. They are all lines of beauty, in spite of a notch made here in the center. These people never have a waist line. You see not the slightest trace of a waist line. Suppose you look at those figures and try to fix the waist line. There is no waist line unless it has been created by a string or a band or something of that sort.

Here is a girl of East India. This is the slave. You see there is no artist that would ever think of making an undraped figure with the deformities produced by dress. An undraped figure always has a large waist. You can imagine what a monstrousity an undraped figure would seem to be that had these notches and furrows made by constricting dress.

Here again is a beautiful figure of another model.

Here is another beautiful thing that Nature makes--these beautiful flowers. Now, our bodies have their natural figures just as the flower has. Often a flower becomes deformed, constricted by some pressure of some sort, and you throw it away. It is not a pleasant flower. You want the flower to have
perfection, the perfection of its natural form, in order to recognize it as a thing of beauty. Now, how about our bodies? Didn't the Creator, who made the flowers, know just as well how to make our bodies? A fashionable dressmaker in New York said to a lady on Fifth Avenue not long ago, "Mrs. Brown,"--that wasn't her name, but that is what we will call her,--"Mrs. Brown, your little girl Mary is fourteen now, and she is getting old enough now so we must begin to form her figure; she must have something put on to grow up into like a cucumber growing in a bottle." It must be God didn't know how to make that girl. The dressmaker must be called in to help you, see. What a monstrous doctrine! It is absolutely impossible, my friends, to interfere with the natural development and growth of the body without doing injury. Even a slight compression, if it does not amount to constriction, is enough to prevent growth, to prevent development. Our bodies are made to be beautiful as the flowers, and to be perfect as flowers. Let us cease deforming them; let us cry out against this monstrous evil which is everywhere in civilized lands, this deforming influence of ordinary dress. Please notice that I do not say the fashionable dress, but the ordinary, the conventional dress is the thing to complain about. The constriction of the waist that we see occasionally on special occasions, the monstrous, extravagant constriction of the waist—that is not a matter of any particular account, because the poor, foolish creatures that do that will soon be killed off, and it is no matter what becomes of them very much, because the race is not going to be benefited any by their living; but the ordinary woman, the mother of the daughter who finds it necessary, or who thinks it necessary to constrict her waist, to put her waist into an abnormal shape, to compel it to grow, to exist in an abnormal shape because fashion commands it,—that my friends, is a great evil we ought to cry out against; and men need to be informed as well as women that this is an evil that needs to be
combated. It is not getting any better either. Fashion now and then has a little spasm, pretends to reform for a year or two, but goes back to the old, extravagant faults after a short time. The fashions are changed only to make business for merchants and for dressmakers. The fashions are not changed to satisfy any necessity or any demand for beauty or variety; that is not the purpose of changing fashions. The change of fashion is purely a matter of business, to create business, to compel people to spend their money for that which they do not need. And I hope every person here within the sound of my voice will undertake to do a little something to stem this tide that is helping on the race degeneracy which is carrying us down so fast.

v=7-2-9.
The Blood

July 8, 1909.

Blood, relation to the health of the body

Blood, healthy

Blood cells, white

" " " Harmful (Illus.) 4, 6, 7, 8

Policemen, Mexican 5 = 6

Germos 9 - 10

Muscles, the, and the blood
Blood purification of the 11-12

Bilious attacks 14-15-16

Goitre 16-17

Bright's disease 19-20

Bad habits of life -

Natural 20-21 22-23 24
THE BLOOD

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, July 8, 1909, at 8:00 P. M.

by

J. H. Kellogg, M. D.

I thought it would be of interest to you if I talked to you a little tonight about the blood. The blood is the most interesting tissue of the body. It is a fluid tissue. The importance of the blood to the health of the body has been recognized from the very most ancient times. When Noah was given permission to eat flesh after the flood, it was especially stipulated that he must not eat blood. He was permitted to eat flesh, to eat all sorts of animals if he could not find anything else to eat, of course, I think that is the fair inference, for the suggestion is made that if he eats the animals they will be afraid of him and likely to eat him. And the very same permission that was given to Noah to eat the animals was given to the animals to eat Noah. It was not the most desirable thing that we should have this mutual consumption of one another—Noah and the animals, but it was particularly stipulated that Noah must not eat the blood,—"but the blood thereof which is the life thereof, thou shalt not eat of it." That is a very remarkable statement. It was known to the ancients. No matter how we look upon the Bible, whether we look upon it as authentic history or as simply the traditions of the ancients that were put down, it is the most ancient of all human records; it is the most ancient of all books, at any rate of all books extant at the present time the Bible is the most ancient; and the fact that we find there in that ancient record, away back in the Book of Genesis, the statement that the blood is the life, is very inter-
ing because it agrees absolutely with the most recent scientific investigations. John Hunter made a very interesting study of this question. He cut nerves and ligated them, and found the flesh remained the same and the blood circulation, and the limb remained warm; it was paralyzed, but it lived. But if he cut the blood-vessels of a limb it shortly died and underwent decay. So John Hunter took this very same position—that the blood is the life. And still more recent investigations have shown that the blood is not only the life of the body, the building, creating power in the body, but that it is the healing power of the body. And that is something which ought to be of interest to almost everybody here. The blood is the healing element of the body.

(>It is the blood that heals. One can not be sick and sick very long while the blood is healthy; while the blood is perfectly sound and well and the blood-vessels are healthy. With healthy blood and healthy blood-vessels, one can not long remain sick. If he gets ill, he will recover. It is only when the blood becomes vitiated, or the blood-vessels become destroyed and injured that serious and permanent disease can exist in the body. )

Now, I am going to show you a few pictures here and to tell you a little something what the blood does. This does not represent the blood. These little figures here I want to call your attention to represent one of the lowest forms of life, the amoeba. You go out at this season of the year and find a little pond by the wayside, or an old watering trough, and get a little of the slime on top of the water, take it home, examine it under the microscope, and you will find the little bodies that look very much like these. These represent what is known as the amoeba. You see the amoeba sometimes looking like that, and sometimes with a great number of legs—three or four times as many as that, and sometimes they are round like this. It is just a little drop of transparent jelly, but it is alive. It is made up of protoplasm which is the
basis of all life, animal or vegetable, and sometimes you see it putting out a single foot, like that, creeping on; here it has put out a foot and is creeping over here; and here it has made a mouth and is eating a germ. Here is a germ that has gotten inside; for the amoeba lives upon germs, upon minute particles of organic matter, and seems to be very fond of germs.

Now, we have little creatures just about like those in the blood; five or six thousand, sometimes more than that, in a drop of blood no larger than a head can be held on the point of a pin; every such little drop contains thousands of them; and in the ten pints of blood our bodies contain, think how many of them there must be. If a single drop of blood as big as the head of a pin contains five or six thousand, how many must there be in the whole body. These cells are all at work doing things.

This represents the connective tissue, the meshwork, network of fibers found underneath the skin, running all through the body, and these little blood-vessels here called the leucocytes find their way into these open lymph spaces and travel from one part of the body to another. They are to be found constantly in the blood. There are different kinds of them. Now, there are several kinds of these white cells. Some of them do one thing and some another. I remember when I was a medical student working in a histological laboratory, I made an experiment one day. I injected into a frog some indigo, and the next morning, on examining the frog's blood, I found its white blood-cells, each one of them, or at least certain ones of them, contained little specks of indigo. These white cells had gathered up those little specks of indigo that were floating in the blood, and taken them out of the blood. It is their duty to do that; so the white blood-cells are, some of them scavengers. Some are germ eaters, but others are scavengers that eat up waste matter.

This is what is known as a phagocyte or macrophag. It is called here
a chromophag because it is after coloring matter. This figure you see here was prepared by Metchnikoff, and explains how the hair becomes white, how we get gray hairs. These little cells traveling around in the blood, and the duty of which is to gather up waste matter anywhere that it is found, waste matter of any sort that is found there—these little cells sometimes climb up the hair, which you know consists of hollow tubes, and there are specks of coloring matter of various sorts which give the hair various shades; and this represents one of those leucocytes or macrophages climbing up a hair and stealing away the coloring matter. You see it is reaching up here to get that little bit of coloring matter. It has gathered in a whole lot of it. These specks represent the coloring matter that has been gathered in. Hundreds and thousands of them circulate through a single hair, run all the way through the hair and steal away the coloring matter; then the hair becomes white. That is the way we get gray hair. They also do some other things that we wish to find out. Under certain circumstances, these macrophages get into the vital organs of the body. This represents one of the tubes in the kidney, a very important part of the kidney, which is useful in removing the poisonous matters. Now this represents some of those macrophages that have gotten into this tube, and what do you think they are doing there? Doing exactly what they do to the hair—they are stealing this substance away; eating up the tube, in other words, destroying the kidney. They are like the rebels, you might say, that have left their legitimate business as scavengers, and are preying upon the body itself.

Now we have another interesting figure here. This was prepared from the brain of a woman 100 years old. This was observed by Metchnikoff. He examined the brain of that woman and found these cells as you see here, swarming into the brain-cells of that woman, eating up her brain. That is why old people
become feeble minded; it is because their brains are actually destroyed by these white cells that swarm in from the blood, which are ordinarily useful, serving a most essential and important and absolutely indispensable purpose in the body, but are capable of doing the body an immense deal of harm.

(When I first visited Mexico some fifteen or sixteen years ago, I was going about the city with a friend, and I noticed some ferocious looking fellows standing on the street corners with pistols and guns,—well armed, and I said to my friend, "What frightful looking soldiers these are. I should be afraid to be alone in the dark with one of those fellows. How does it happen they have such awfully fierce, ferocious looking men here for police. They don't look a bit like the police we have down in New York or Chicago, and especially the London police.) They are amiable fathers, and nursing fathers in Israel, you might say." (But my friend said, "I will explain that to you. You know Diaz when he got possession of the government here, was troubled for years with the guerillas in the mountains, the brigands, and didn't know what in the world to do with them. Finally an idea occurred to him, and he sent out for the leaders of the various bands to come to see him, and when they came, he said to them, 'How much do you make in your business of robbing and stealing, on an average—about how much do you make in a month?' They gave him the sum. 'All right,' he said, 'now I will double that. You come to town here and I will make police of you. You can carry guns just the same, and you can shoot if necessary, and you help me keep things straight, and I will pay you twice as much as you are making by your present business.'" And they accepted his proposition there; and the brigands that formerly lived in the mountains of Mexico are now to be found in the cities and towns serving as a useful purpose as police. But suppose these policemen should suddenly be seized with the old desire to pillage and to kill, and to slay; suppose they should suddenly break loose and
break loose and go back to their old work again. That is exactly what you see these scavengers of the body doing, these white cells. They are doing exactly what those Mexican policemen would be doing if they should suddenly turn upon the inhabitants of a town and go to tearing down houses and killing everybody that came along. That is just what they are doing. Now, the important thing for us to know is what are the conditions under which they do this thing? The important thing for us to know is what are the conditions under which these very important white cells of the body, that serve such a useful purpose in keeping the body clean, in eating up the debris, the rubbish of the body,—under what circumstances they turn upon the body and destroy it, rendering the hair gray, if you please, destroying the kidneys, assailing the liver, attacking the brain, attacking the walls of the blood-vessels and destroying them so that they become converted into chalk and lose their ability to resist the pressure of the blood, narrow their caliber so that they are unable to convey an adequate supply of blood to the various organs of the body—what are the conditions? The conditions are simply these: I think I must tell you a story, first, to illustrate it, to make it plain. I was riding across the western plains some twenty-five or thirty years ago, a little over thirty years ago—I was going across the western plains on the train, through Nebraska one day, and looking out of the car window I saw a poor cow, just skin and bones, struggling along, barely able to stand upon her feet; just barely able to stagger; and there was a hawk perched upon her back picking her bones. Now, that hawk had not waited for the cow to die, quite. The cow was dying, and the hawk recognized the fact that the cow had got so near dead she was no longer able to defend herself, and could pay no attention to it, but just stumbled blindly along, and the hawk packing away on her back. The cow had lost her power to resist, so this scavenger bird, this enemy of life, of all living things, but
particularly the scavenger bird, had perched upon her back and was eating her while she was still alive.

My friends, that is exactly the situation. That is the condition in which these scavengers—that is exactly the situation in which these scavengers attack us—these natural body scavengers. There are many billions of them in the body, and they attack us under some conditions,—when the habits of life are such that we become reduced, our powers of resistance become reduced, the blood becomes impure so that its fighting power is diminished, and the tissues are polluted so that they have lost their power to resist the encroachments of the enemies of the body—that these scavengers of the body, seize upon the body itself while it is still alive, not waiting for it to die,—seize upon it and hasten the process of death. Metchnikoff has shown this all out. I am not speaking on my own authority in this matter at all; I am speaking on the authority of Metchnikoff, one of the greatest scientists living at the present time, the successor of the great Pasteur in eminence, I think, among the workers of the Pasteur Institute at the present time. He has worked this out by long years of patient study of different classes of animals he has gathered about him there—very aged cats, for instance. If he hears of a very old cat anywhere, he sends for that cat; or if he hears of an old sheep, he sends and gets that aged sheep; if he hears of a very old dog, he gets that dog; and if he hears of a very aged person who dies at the Sal Patriers,—the poorhouse hospital of Paris,—he is after that person to study the tissues of the brain and various organs; he has made this a basis of study for many years. He has even studied old aged polyps, and aged birds of all sorts, and all kinds of aged animals—aged turtles and tortoises, aged trees even, he has studied; and he finds that the thing which produces old age is the attacks of these scavengers upon the body,—the thing which produces the decrepi—
tude of old age is the attacks of these scavengers, and the thing that causes the attacks of these scavengers, is the accumulation of poisons in the body, so that the tissues of the body are so deteriorated that they lose their power to resist. The cause of these poisons we are talking about which intoxicate the tissues, and reduce the fighting at the power of the body,—intoxicate them, stupefy them so they lose their power to fight against their enemies,—is undigested foodstuffs remaining in the colon.

Now, we see, then, that the blood is a matter of wonderful importance. But there are so many things we have to talk about that we must hurry on.

This shows you just a few of the different kinds of germs the body has to fight. I won't stop to tell you about these. There are various kinds of germs here—leprosy germs, germs of tuberculosis, and other sorts of germs. This is to show you how they fight the germs. Here are some of those white cells creeping along the edge of a blood-vessel. They do not go along in the center of the blood-stream, but they creep along the vessel walls. Here are the red cells that go along the center. They march along in a line like the hod carriers you see marching up a building, carrying brick and mortar, and that is what they are for. They carry oxygen down into the tissues; then go back, get another load and carry some more oxygen down into the tissues. But here are these white cells creeping slowly along, edging along the walls of the blood-vessels, looking for little particles that slough off the walls, and cleaning them, just like the street cleaners that go along the streets, cleaning the streets, cleaning out the gutters,—that is what they are doing; so they always creep along the wall. Here you see them heaped up here, and coming along down to this point, where they heaped up and accumulated; because when they got to this certain point, they smelled something. Out in the tissues beyond here, were these bacteria, these germs that have gotten into the
the tissues,—when they get along here they they stop, right opposite these germs. They know they are there. Now each one of these cells is nothing but a little speck of transparent jelly. It has no ears, has no eyes, has no nose, has no mouth; it is nothing but a little drop of jelly, yet it has all these wonderful faculties of perception and manifestations of intelligent. When they get over here opposite these germs, they stop right there, then make a little gimlet and bore a hole through the wall, and creep through that little hole, as you see this one doing,—creeping through the little hold until they get out on the other side; then they close up the hole behind them, and go off after the germs. They do not go aimlessly hunting about on a chance of finding germs,—oh, no,—but they go right straight for them. This cell here is going right straight after that germs. It does not go hunting around wandering about, but it makes a bee line for the germ, takes the shortest cut, and gets there quick. It is not like the dog in the woods that goes hunting around to find the game, and goes here, there and everywhere, but it goes right straight to the germ, captures and swallows it. Here is one that has swallowed one; here is another that has swallowed two or three; here is another taking a bite, and here is another which is getting ready to close in on it. They are in this way fighting all **am** the while to save our lives. Why, my friends, we could not live a single day if it were not for this thing. We are assailed by germs in countless numbers every moment of our lives; our skins are completely covered with most deadly germs. The germs are so abundant that those contained in one drop of saliva, under proper conditions, would destroy the life of any person here. There is probably not a person here in this room who has not saliva so poisonous that if it were put into an incubator and allowed to grow a little while, and then injected into another person, would produce death in a very short time. We are continually associated with deadly germs. The alimentary
canal is producing every day anywhere from ten to 300 trillions of these germs, many of them of a most deadly character. More than 160 different kinds of germs have been found growing in the alimentary canal, in the intestine. These different species are enumerated by Prof. Roger, the pupil of the great Bouchard, of Paris, in his most recent book on the subject. Now these germs are assailing us continually, and it is only because of the continual fighting of these little white cells, that we are kept alive. As soon as death occurs, the bacteria swarm all through the body, whether it is that of a human being or of some other animal, any member of the animal kingdom,--as soon as death occurs, within a very short time, a few hours, the whole body is swarming with germs. This is one reason why I object to the use of flesh foods,--because the meat you get in the market is just alive with germs, swarming with them. There is nothing else you can find anywhere that is so full of germs as choice, prime beefsteak that you buy at the market, the kind that you like so well because it is so very tender. It is just full of germs, and the flavors of it are due to the decomposition products largely to the poisons produced by the germs.

Now, this work of defending the body, depends upon the integrity of these white cells I was telling you about, that we were just looking at. When these cells are poisoned by poisons in the blood--and they are certain to be influenced by any poisons that may be circulating in the blood--then they can not do the work.

This is a picture of the heart which circulates the blood. Here is the great vessel through which the blood is propelled to all parts of the body; here is the large artery through which the blood is propelled to the lungs to be purified. It is really a double heart. Underneath the muscles which you see displayed here are the bones. Somebody stole my skeleton, so I am not able to show you that; but the bones are underneath, and these bones are not
simply the framework of the body, but recent investigations have shown that the bones are the laboratory of the body in which the blood is made. Isn't that an interesting thing—that these bones, those uncouth, ugly bones that have nothing beautiful about them, should be the place where the blood is made—this most essential of all body fluids, that is endowed with such wonderful properties of creative power and reparative or curative power,—that it is in the bones that this blood is made. (Now the muscles move the bones. The blood-vessels which supply the bones also supply the muscles which overlie the bones; so upon the amount of blood that is made in the bones depends the amount of blood circulated through them, for the blood is prepared from our food; and if the blood is not well circulated through the bones, the blood-making process will not be carried on with proper facility; so you see how important it is that we should use the muscles. If we are short of blood, want more blood, we can get it only by using the muscles as pumps to pump the blood into the liver laboratories, which are wrapped about and covered by and inclosed within these masses of soft flesh which we call muscle. So you see how important exercise becomes as a means of promoting blood-making; how absolutely essential this exercise is as a means of making vigorous, active bodies,—producing a vigorous, active blood-making process.)

The blood is purified by the lungs and by other organs, and in the lungs we have also this wonderful work of resisting germs. Germs are taken in from the air. With every breath we breathe, nearly, we take in more or less germs. These germs get down into the remotest passages, into the air cells. Down in these air passages there are found a curious species of cell that have hairs in the top, and these hairs are in constant motion; they are in constant motion during sleep; and for hours after death these hairs may be found still in motion because the cells themselves have not yet died. One of the duties
of these cells is to fight germs. You see some germs in there caught in these little hairs, and the motion of the hairs is always upward toward the mouth. You feel something coming up into the throat, and you expectorate it. It is brought up there by these little hairs. They keep a current travelling up here all the time. Here is a case in which the river flows up hill, if you please. It travels up through the trachea, through the larynx into the throat, and it is carried up here by means of these ciliated cells, each one of which is really a living creature which is attached to its lower end as a flower is attached by its stem. This is one of the means by which the body defends itself against germs. And the lungs are purifying the blood, carrying off the gaseous poisons.

Now, there is another kind of poisons in the blood which require an action of a different sort; so the blood that comes from the stomach, that passes through the stomach and the spleen which you see over here, and the pancreas which lies behind the stomach and the intestines here,—all the organs found within the abdominal cavity—most all of them at least,—from these organs the blood supply is carried off into a large vein, the portal vein which passes into the liver; so this blood is distributed through the liver in which it is carefully inspected, and poisons which have been absorbed from the stomach, that have been taken in with the food, as lead when you drink water that has passed through lead pipes, or alcohol, if you use alcohol, tobacco if you chew tobacco or smoke it,—even of tea or coffee if you use those intoxicants; and different poisons of any sort that are taken into the body, they are carried through the liver, and the liver filters out some of them, and some of them it soaks up into itself; other portions it destroys; other portions it oxidises and prepares for elimination by other parts of the body; so you see how important the liver is as a gland.
Here is a very interesting experiment represented here which shows you how necessary the liver is. It represents an experiment I saw at St. Petersburg a couple of years ago in the laboratory of the great Prof. Pawlow. The experiment was made upon a dog. It was not made for my special benefit, but the experiment was made that particular day because I was there; but this dog was being prepared for another professor in another place who had asked to have the operation performed for him upon the dog. This represents the portal vein, the vein that carries up the impure blood to the liver to be purified, the blood that has been absorbed from the intestine, stomach, and other organs. The operation consists in attaching this portion to the ascending vena cava—the great vein that carries blood up from the lower extremities and carries it up into the heart. You see here the blood that passes into the stomach, spleen pancreas, intestines and these other abdominal organs is carried to the liver before it goes into the general circulation, passes through the liver to be purified, then goes out at the other side of the liver to the ascending vena cava; but the operation consists in joining these two veins together so the blood passes directly into the vena cava without going through the liver. So the portal vein is first attached to the vena cava here; then the vein is ligated so that it is impossible for any blood to go through the liver; so in other words the liver is cut out. The result of this is, you see, that the animal loses the use of its liver, no longer has the use of its liver as a purifying organ to purify the blood and other substances which may be absorbed from the stomach and intestine. An animal that has had this operation performed gets well in a few days, appears like any other dog, runs about, plays and enjoys just as good health as any other dog; but something has happened to that dog. It is necessary it should live on a very strict diet. You know, it has to live on the Battle Creek Sanitarium diet. They cannot feed this dog.
on the ordinary hotel or boarding house diet. The things you have been accustomed to eat at home would kill that dog right away. If a dog that has had that operation performed eats beefsteak or meat of any sort, in three days it is a dead dog; and a dead dog is not worth very much. This is what is known as Eck's fistula, as Eck was the man that devised the means of making this experiment. It is a very interesting experiment, isn't it, that the dog that had this experiment made can eat bread and milk and enjoy as good health as any dog as long as he lives on a diet of bread and milk, but after it has had this operation performed it can not eat meat, and if it eats meat, in three days it is dead. Why does it die? Because the poisons which result from the eating of the meat, the poisons which are formed in the body from the eating of the meat, and which the liver is unable to destroy because these poisons are not carried to the liver, but go straight into the circulation at once,—instead of going through the liver so that they might be destroyed and removed from the blood.

Now, my friends, the important lesson I want to call your attention to just at this point is the fact that some of you have got just that kind of liver. A lot of you have got it. Every one of you that suffers from auto-intoxication has got that kind of liver. It is in practically the same situation. You haven't had this experiment performed; you haven't had your portal vein combined with the vena cava in this way, but your liver has been crippled to such a degree that it is almost as much disabled as in the case of the dog that has had this operation performed; and that is why you had the bilious attack; for you would not have a bilious attack if your liver were able to get the poisons out of your blood. The bilious attack means simply poison blood—it means auto-intoxication. I told a lady that the other day,—that she had auto-intoxication, and she was very angry; her face flushed and her eyes flashed, looked at me very spitefully, and she said, "You are entirely mistaken, sir; I
haven't had a drop since night before last. I am not intoxicated. I haven't had a drop since night before last." She acknowledge that she took a little toddy every night usually to sleep, but last night she didn't take any; so I was quite mistaken in calling her intoxicated; but she didn't understand the sort of intoxication I am talking about is a great deal worse than alcoholic intoxication, a great deal worse; it is more direful in its consequences than the autointoxication that comes from the putrefaction of food remnants in the colon; it is far more direful in its consequences than alcoholic intoxication, because alcohol is a comparatively feeble poison, but these poisons that are formed from putrefaction are many of them more highly toxic and poisonous than alcohol. It would take a hundred times as much alcohol to make a man really as sick as these poisons that are formed from putrefaction. They are most deadly poisons. You know the Indians of South America dip the points of their arrows into decomposing flesh, and when they shoot them into animals and man, they have a speedy death. You have heard how butchers sometimes in cutting off steak for their customers accidentally cut themselves. What happens to them? If a butcher cuts himself that way with a knife that he has cut meat with, the butcher often dies of blood-poisoning. But he can take the whole of the same poison into his stomach, a little of which injected under the skin will surely kill him, and it does not kill him. Why doesn't it kill him? Because he has got a good liver. These poisons that pass through the system are destroyed by the liver. That means your liver has gone out of business; it means your liver is crippled, it is overwhelmed and it is easily worn out in destroying poisons; it has surrendered, given up, and does not do the work it once did, can not do the work. Why, when a person has once had a really down-right bad bilious attack, he ought to take warning from that attack and look out that he does not give occasion for another, because if he should get another it
would be worse than that one. When you are once broken down, when these defenses of the body have once broken down, they are not easily repaired; they can not be entirely repaired; the important thing in that case that can be done is to watch out and not give any occasion for extraordinary or emergency work.

Now, this represents the appearance of the liver through the microscope. Here are the individual liver cells. The blood is brought in around these cells which inspect the blood and pass the poisons out through these other tubes which pass down and on out through the body, and so drains the liver of its bile. The liver undergoes changes because of the contact of these poisons with these different cells. They become intoxicated, damaged and deteriorated to such a degree that those macrophages I was showing you at the beginning of my talk this evening, swarm into the liver cells and destroy them; then one has hardening of the liver. That is what fatty degeneration of the liver is, and cirrhosis of the liver. That is the way it comes about; so you see how important it is to keep the blood clean and pure, so that the liver won't have such an extraordinary amount of work to be done.

Here is a very interesting organ—the thyroid gland. You have all heard about the thyroid gland. You hear a great deal about it nowadays, and about having part of it removed. When a person gets exophthalmic goiter, why is it? Because he eats so much beefsteak, takes so much into his body that the gland gets excited and becomes enlarged. It is the duty of this gland to destroy poisons. The liver destroys about half of them, but about half pass through the liver, and some other means must be provided to dispose of the poisons, and the thyroid gland is one. The thyroid gland makes an interesting substance, thyroidin which, when it is poured into the blood and circulation, comes in contact with the suprarenal capsules of the liver and stimulates
the suprarenal capsules of the liver to make another substance, adrenalin, which, when found in the blood, enables the blood to destroy the poisons circulating in it; causes oxygen to combine with these poisons and burn them up. When a person takes too large an amount of these poisons, more than he ought to, if he has formed in his intestines a large amount of these putrefactive poisons from decomposing flesh foods or eggs or any other excessive quantity of protein, the result is this gland is overstimulated, grows, gets to be sometimes twenty times as big as it ought to be; and then it becomes abnormally large in the form known as exophthalmic goiter, and sometimes an operation is performed to remove part of it, taking off one lobe, or taking off two lobes, leaving the central portion generally, and removing one lobe and, if necessary, removing part of another. This is wise, because when too much of the secretion of this gland is poured into the blood, the heart is excited and other mischief is produced.

Then, if the cause which produces this difficulty still continues, even in spite of the operation, the gland will grow again. I have known patients to have two or three operations, and had it about as bad as ever at the end."

This is that suprarenal capsule I was just telling you about. The secretion of the thyroid gland excites this gland to make a substance which destroys poisons in the blood—adrenalin. So long as this work goes on satisfactorily, the person is comparatively safe.

Somebody asked me the other night to tell something about arteriosclerosis; so I have thrown upon the screen here this picture which shows you an actual view of arteries which have undergone this change of arteriosclerosis. This is a little slice off the end of an artery that has been cut off, and showing you the actual thing. That is just the way it looked when it was examined. Both these arteries are thickened. This was one in which the accumulation had gone on until the arterial wall had been very considerably thickened, and here
is one which is much more advanced. Now the ordinary arterial wall will be nothing like as thick as it is here—perhaps half or two thirds as thick. This would remind you at once, I am sure, of a water pipe in which sediment has been accumulating inside; and it has been deposited inside; the hard water has been circulating through, and the lime is precipitated by the heat in the hot water boiler, and the pipe leading out from it is encrusted on the inside with lime, magnesia and other things. It is a very similar condition here; for the wall first becomes thickened by a deposit of chalky substance, which then becomes fibrous, then it becomes brittle, and this renders it weak, and then it is likely to go to pieces, to burst out, and there is nothing to protect us from immediate death but this lime deposit which thickens the artery and so protects our lives. This process may go on until the artery is nearly closed up, and in the small artery it would be entirely closed up. Suppose the artery was only half the size of this artery, you can see it would be entirely closed. But suppose it was only one twentieth the size of this, it would have been closed up long before this thickening had proceeded to such a degree as it has here. Suppose this change takes place in a finger, or in the liver, or some other organ—you see at once what mischief might occur.

This represents the blood circulation in the intestine. This represents the great blood supply of the intestinal wall. This is the intestine, here are the arteries, and here the veins which carry the blood and the absorbed food away from the intestine. The recent studies of this subject have shown that this is the part of the body in which these changes and this degeneration is most likely to occur. So far, I don't know that any one has called attention to the reason why, but it seems to me very clear why degeneration should first occur in these vessels, because these are those which are most exposed to poisons, first and most of all exposed to the poisons which produce this degener-
ation, because after poisons have been absorbed and carried through the liver, the liver destroys some of the poisons, takes some of them out; but in the portal circulation, and in these vessels here, we have the first symptom of arteriosclerosis or hardening of the arteries, and here is where the process is carried on to the greatest extent. You readily see what happens, then, in the liver, which gets its blood supply from the stomach here, and you can readily see what mischief results.

Here again is the kidney. This shows the wonderful process by which the blood is brought up here to the kidney, and it is through these large arteries which are twice as large as the veins—the reverse of what the condition is in other parts of the body. The serum is forced out, and the chlorid of sodium is absorbed, taken into the blood; and in exchange there is poured out into the tubule urea and other poisons which it is desirable for the kidney to get rid of. So the poison escapes from the body. See what happened here. The arteries become hardened, and the caliber becomes diminished, and the efficiency of the kidney is cut off. There are thousands of people that haven't yet got Bright's disease but are just next door to it. They have really got Bright's disease, but it has not yet become apparent. When Bright's disease is apparent, and the patient goes to a doctor who finds albumin in the urine, that is, when the disease has gone on so far that albumin is poured out into the tube here so it is found in the urine, or casts—little portions of the lining of the tube slough off and are found in the urine,—but long before that occurs, even years before that occurs, these vessels are hardening, the process is at work which is ultimately going to bring the patient to this condition.

The man who smokes and says, "Oh, smoke doesn't hurt me,"—he is hardening his arteries every day; he is bringing himself nearer and nearer and nearer to the point when by and by Bright's disease will make its appearance, and where
albumin will make its appearance. When a man goes to a doctor for examination, and the doctor examines him and finds albumin in the urine and says he has got Bright's disease, he should say to him, "You are nearly dead with Bright's disease; you have had it for years, and now you have got to the point where you can not live but a little while, and your case is absolutely incurable." It is just as impossible to cure a man that has got Bright's disease and gotten to the point where albumin and casts have appeared, as it would be to make a house good when the fire has burned all the way up through the walls from the basement and finally broken out through the roof and gutted the house. A man that has got albumin in the urine has his house afire if you please, and that man's whole body is in a state of disease; every blood-vessel in his body is diseased; every tissue is diseased; for his body has been for years saturated with poisons to such a degree that finally the macrophages have swarmed into his kidneys and into his liver and spleen and other organs, and the walls of the blood-vessels are found tearing down the natural and healthy tissue, and have been depositing in its place the fat and the lime which are the accompaniment of degenerations of this sort.

Here are some various kinds of diseased kidneys,—gin kidney, cirrhotic kidney, fatty kidney, a kidney which is congested, and this is a healthy kidney. Now, I have been giving you these pictures not to frighten you, but to hold up to you something of the battle that is going on within our bodies between the body itself and the causes of disease, to give you something of an idea of the actual facts, actual things that are transpiring. Now, these deadly things that are happening to us, these attacks that are being made upon us by bacteria and even by the healthier cells of the body under certain conditions through the result of our wrong habits of life. Just think what it means, then, when you sit down at the table and load your stomachs and alimentary canals with
toxin-containing substances,—with tea, with coffee, with beer if you please, and mustard, pepper, peppercorn, ginger and these other unwholesome things that are destructive to the liver and the kidneys, and that deteriorate the body cells and lessen the resisting power of the body. What we should do is to co-operate with our bodies, keep our blood clean, keep the blood-cells active and healthy and able to do their work; and if we will do that, my friends, there is no reason why we should not be just as healthy as the flowers; there is no reason why our breath should not be just as sweet as the breath of roses. The natural breath of the body is not offensive. I met a man in the office the other day, and I mentioned to him that his breath was a little offensive, but he was not aware of it. He said, "Is it possible? Does my breath smell bad, Doctor?" I said "Certainly it does; it smells like a dead rat, my friend." I wanted him to appreciate the thing, because I had been laboring with him for some little time to correct his wrong habits. I didn't exaggerate the thing a particle. His breath smelled like a decomposing, rotting carcase of a dead beast of some kind; and it was the fact that this rottenness was inside, and this decay was taking place right in his alimentary canal, and the products of decay were being absorbed into his blood, finding their way out as best they could through the liver, kidneys, skin and lungs, and he was saturated with it, so his breath was saturated with it.

There are thousands of people living in just that way. Every person that is going about with these dark circles around his eyes, and a foul skin, fetid stools, coated tongue,—every person in that condition is in a state of saturation with poisons; his body is saturated with poisons. How in the world we are able to live at all under such conditions is a marvel to me. I meet people every day in such a condition that it seems impossible for them to live. We have departed so far in our acquired habits of life, we have gotten
so far away from our natural conditions of things that it is a marvel that we live at all. And it is only because the human race is the toughest of all the races of the animal kingdom. It seems to me it must be this is the reason why we are able to live; but we are not living very well; we are degenerating very rapidly. Human life is getting shorter. The number of old people is getting less; the expectancy of life, according to the life insurance companies, their recent report, after sixty years is considerably less than it was twenty years ago. That is, chronic disease is rapidly increasing, and there are many evidences that the race is degenerating. One of the missions of this institution is to call attention to this fact and to endeavor to win men and women back to normal conditions, to a normal, rational mode of life.

The facts I have been giving you tonight are not whims or fancies; they are not picturesque, pictorial expressions which are away beyond the truth, but simply plain, naked facts of science that such men as Metchnikoff and others of the most eminent men of science have worked out and have published to the world. You can find them in the textbooks of medical schools, that are used in the medical schools at the present day; they are current medical facts, and I am simply showing you tonight their relations to our everyday habits. It is a thing every intelligent man and woman in the country ought to have a chance to know. I am speaking these last few words as earnestly as I know how because I want to feel that some of you at least are going to change your habits, that some of you are going to apply these facts to your daily lives, and that when you go home you are going to start an American straight on with the new life. I hope you will get used to it while you are here, so that when you go home it won't be difficult. (A gentleman came in a couple of weeks ago who was smoking several cigars a day, and I began to tell him what the cigars would do to his body, to his blood-vessels, how they would raise the blood-pressure and produce
arteriosclerosis, etc. He said, "I don't see how I am ever going to get along without my cigars; I am so fond of them, and it is a very, very old habit with me." I met him again a day or two ago and asked him how he was getting along. He said, "Fine, Doctor, fine, and I don't want any cigars, don't want to smoke. I have lost the desire to smoke." Now isn't that fine? I think that is simply splendid. This gentleman had the experience of dropping off a cigar now and then for a long time, at home, for quite a while, and yet the desire remained. Now, I said to him at the time when I first met him, that the Battle Creek Sanitarium diet and the mode of life he would pursue here, if he followed it he would soon lose the appetite; because when we undertake to return to the natural diet, return to Nature, to do the best we can about it, the first thing we know the old appetite is dropping off, and the old desires are disappearing, the perverted tastes are gone, and we find ourselves fitted out with what seems to be almost a new set of tastes or instincts. They are simply getting back to the old condition again, the primitive condition in which we were born. So I am not seeking to present anything new to you; I am only seeking to win you back to old ways, and to hold up standards of normal, natural life which will enable us to live long in the land and to enjoy health, at least as long as is best for us. So I beseech you to think seriously of this matter.

If you learn to live naturally while you are here, according to the Sanitarium method, or the Battle Creek idea, as we call it for short, when you go home, keep right on about it; don't contemplate returning to the old ways; don't go back to the old tea, coffee, cigars, beer or anything else that you have abandoned while here, but keep making progress, go on, advance, learn new things every week and every month, how to live right, how to live well, how to get health, learn what is really right living and follow it. Real high living is
not the sort of thing that people generally call high living. That is a very low kind of living; but high living, living right up on the top shelf, if you please, is right living, simple living, living near to Nature, living right, so as to have a clean mouth, and clean blood, and a sweet breath. I trust you are all aspiring to that sort of life.

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v-7-12-9.
We have upon the screen a picture which will give us something of an idea of the appearance of the blood under the microscope. The blood is the most wonderful tissue in the body—a fluid tissue which circulates all around, and may be spoken of very properly as a sort of traveling market in which every tissue finds the things it needs and pays for what it takes from this circulating market in exchange for wornout residues of the tissues which have been used up.

Now, this represents the white blood-cells. Remember that I told you there were two kinds of cells, the white and the red, and that the white cells were less numerous—only about 7000 in a very minute drop, whereas of the red cells we have nearly five millions in one minute drop not larger than can be held on the head of a pin; these little creatures are so very, very small. These represent the white ones, and there are many different kinds you see. Here are some red cells, and two different kinds of red cells; but the white cells are the more important. Here are some very large white cells. Here are some with single nuclei, and here are others with multiple nuclei, a number of nuclei, and here are some that look somewhat like strawberries and raspberries. These are very interesting varieties. Now, some of these small ones have for their diet to catch the microbes or germs which are constantly invading the body, to fight them off and capture them. The large ones are scavengers, and their business is to hunt up the debris, all the minute waste particles of tissue that are worn out, and to digest them, actually consume them, to pick them up and
carry them off. They have the spleen for a sort of rendezvous, and the lymphatic glands; and in these various places, the spleen and the lymphatic glands particularly, they undergo some repairs, perhaps, when they are in need of repair. If it were not for these white cells in the body, we would succumb at once to the first attack of infectious disease,—typhoid fever and tuberculosis, pneumonia and all of these diseases we depend upon these white-cells for destroying the invading microbes. Now the reason why an outdoor life is so useful for a person suffering from tuberculosis is because this outdoor life encourages the development of the white cells. These white cells are better able to combat the germs of the tuberculosis when one lives out in the open air, for it encourages their development. So the cold baths are helpful to an increased resistance against disease, because cold baths encourage the growth and the development and production of these white cells. For example, if a person takes a short hot bath and follows this by a short cold bath, half an hour afterwards if the blood is examined it may be found to have 30% more of these white-cells than before the bath. Now, think of that, my friends,—an increase of 30%. Suppose you could increase your wealth 30% in half an hour; suppose you were worth $100,000, and in half an hour's time, by some little slight of hand performance you could convert that $100,000 into $130,000,—how often would you be bringing that method into requisition, wouldn't you? You would be doing it several times a day. Now, the cold bath does that very thing. These white blood-cells are the most important property we possess, because they are our fighting men. They form a barricade that stands up between us and death. When the typhoid fever germs assail us, when tubercle germs attack us, when pneumonia is doing its work of mischief within us, these white cells swarm out in countless numbers to defend us; so the more we have the better off
we are. So when a patient has typhoid fever we give him cold baths, and the cold bath does not simply lower his temperature,—that is the smallest part of it; the purpose of the cold bath in typhoid fever is to stimulate the production of these white-cells because in typhoid fever particularly there seems to be a disposition for these cells to disappear; they diminish in number; the poison of the disease somehow prevents the growth and development of these white cells; but by giving the cold bath, this effect of the disease is antagonized to some degree, and the white cells are increased in number.

Now, the same thing is true of cold air. That is the reason why staying outdoors is so helpful in pneumonia. (Down in New York they found out that the way to save babies' lives when they got pneumonia is to put them right outdoors; so in the coldest winter weather, in the New York hospitals, they have flat places arranged on top, and in the very coldest weather, when the blizzards are blowing, you can go out there in the cold air and find the babies which are not more than two years old, all bundled up, but just so they can breathe the cold air, and you find nurses out there bundled up in furs with them. They take care that they don't freeze to death, but they allow them to breathe the cold air. They are all surrounded with hot water bags, bundled up in wool, only their faces a little bit exposed so they can breathe in that cold air into the lungs; and the taking of this cold air into the lungs has the effect to stimulate the development of these white cells. They are so important in pneumonia that we can almost tell when a man has pneumonia because they come swarming out in such great numbers. For instance, if a person has 7000 in a state of health, he gets an attack of pneumonia, has a hard chill, and within two or three hours afterwards he will have 20,000 white cells—two or three times the number he had at first within two or three hours' time, when he is getting an attack of pneumonia, and the next day he will perhaps have 100,000 when he had only seven
thousand at the start. It is amazing—the rapidity with which these cells grow. They develop in such numbers sometimes, increase so that several billions of them are produced within twenty-four hours, within the body. They multiply so rapidly to meet some emergency of that sort that is developing in the body when it has been invaded by these infectious germs. So you see the outdoor life has a great significance. (If I had serious disease of any sort, I would go outdoors and stay there; I would not go indoors day nor night; I would stay outdoors no matter what sort of climate it was in; I would go outdoors and stay there if I had any grave disease, because the same thing that helps a person that has tuberculosis, will cure any other disease.) (It is the blood that cures; never forget that. It is the blood that cures; it is not medicine that cures; it is not baths that cure; it is not diet that cures; it is not climate that cures; it is the blood that cures. It is always the blood that cures. The blood is the great power of the body, the healing power of the body.) (When God gave Noah permission to eat animals, he told him to be careful not to eat any of the blood, because the blood is a sacred thing; the blood is the life. God said to Noah, the blood is the life, therefore thou shalt not eat of it. So Moses told the Children of Israel that they might eat certain animals, clean animals, but they must never touch blood; so it was given to the whole human family, you see. After the flood that command was given, that they were never to eat blood; yet you see some people sitting down and eating blood puddings; you see some people sitting down at a table, cutting a beef-steak, and the blood just running out all over the plate. I have seen that very thing; I have actually seen people take bread and sop it in that blood, and eat it, when there is a command in the Bible absolutely prohibitive of eating blood as a sacreligious thing to do. But you say that applied to the old dispensation and don't apply now. You are entirely mistaken, my friends. You
remember Paul was teaching the Galatians 25 or 30 years after Christ, that they did not need to pay any particular attention to the old Jewish laws; and Peter came down there and told them they must be particular to observe those old Jewish laws; so Paul and Peter went up to Jerusalem and had that little theological quarrel settled, and there is an account given of it, I think in the 15th chapter of Acts,—how that the church at Jerusalem, the council of apostles that were there, that were still surviving—and James was there. He was the brother of Jesus Christ,—James was the president of that council, and they were deliberating about it for some three weeks, and they gave their opinion. This is what James said: "It seemeth good to the Holy Ghost and to us to lay upon you only these four necessary things; to abstain from flesh offered to idols, and from things strangled, from fornication, and from blood." Now that was laid down for the whole Christian dispensation, and a man that professes to believe the Bible, a man that professes to be a Christian has no more right to eat blood than a Jew had, under the old Jewish dispensation, because it has passed over into this dispensation. It was given first to the whole human family by God himself, through Noah, and then reiterated to the Jews by their great leader, Moses, and was given to them as a divine command; and then it was reiterated by the greatest authority in the whole Christian church, the first president of the first Christian church, or the first Christian council, where James, who was the brother of Jesus Christ, this man and that council laid that down as obligatory upon all Christians for all time,—that they must not eat blood; and that is the reason why they could not eat things strangled—because when the thing was strangled, the blood was in it, you see.) The old Jews, when they slaughtered an animal, they cut its throat and allowed the blood to run out; then they put the flesh in water and they washed it and washed it, and put it in salt water to soak the blood all out of it. I was talking with a young Jew some
time ago whose people are very orthodox Jews, and he said, "We do not eat much meat in our house," and I said, "Why?" "Well," he said, "we do not care much for it." I said, "Why don't you like it the way other people do?" He said, "Well, you know our meat is prepared in such a way it does not have much taste to it. Mother washes it until it is nearly as white as a towel, so there is not much flavor in it." I had a letter from a Jewish rabbi in Portland, and he gave me an account of how careful orthodox Jews prepare the meat, that it should have no blood in it. That is some little time ago. I saw a rabbi from Jerusalem, and he told me how extremely careful the orthodox Jews there are in the preparation of meat. The meat is nearly white when it is cooked. The blood is all washed out of it. Some of you perhaps know this to be the truth of your own observation. I was talking with a very intelligent young man from Boston a few years ago, and he told me that they had in connection with the sink in the kitchen an arrangement especially for scrubbing the meat to get all the blood out of it.

I used to feed people here on laundered steaks when I had not yet got over feeding meat. I have not eaten meat myself for forty-three years. It is pretty nearly forty-four years now since I discarded flesh from my dietary, but I used to prescribe it for some of my patients. I thought that was the easiest way to deal with their symptoms. In fact, at that time, I did not know any other way to get along with them. If people had sour stomach, I used to give them meat, because we thought the sour stomach was due to fermentation and meat would not ferment, and that was about the only thing that would relieve them. But Pavlov, the great St. Petersburg physiologist, showed that meat was the very worst thing possible for such cases. I met a
short time ago a very intelligent gentleman who has been with us for two weeks, and when he came here he had terrible acidity, quite three times as much acid in his stomach as there ought to be, and he suffered from it a great part of the day. Within two or three hours after eating, he had terrible pain in the stomach, gnawing of the gastric juice upon his stomach, the gastric juice in his stomach, and he suffered so terribly he could hardly endure it. He had to get up in the middle of the night and take a glass of milk to relieve that awful pain. Two or three hours after eating, he had to take a glass of milk or something to relieve his stomach. He was eating meat all the while. He has been here just two weeks, has eaten no meat since he has been here—not a particle,—has taken no medicine for his stomach trouble at all, but he said to me, "Now for three days I have not had a particle of pain in my stomach, for the first time in years." Twenty years ago I did not know how to manage these cases, and I supposed meat was necessary, for meat would always give temporary relief; so we thought if we should give them meat, it would be the best thing for them, because if we gave them starchy foods, especially oatmeal mush and things of that sort which we didn't know any better than to use in those days, they always got a great deal worse. Now we know the reason for that. (Pawlow has shown that when a person takes meat into the stomach, the meat temporarily absorbs the acid, and neutralizes it, but at the same time stimulates the stomach to make more; so the longer a person uses meat, the worse the stomach will get. It will simply get worse and worse and worse and worse.) Now, if a person is accustomed to eating meat, he has a stomach that secretes an enormous amount of acid, and if such a person eats bread and cereals, they will not neutralize the acid, so the acid is poured out, and it is all there and active, and nothing there to absorb and neutralize it as the meat does; and the consequence is it attacks the
stomach. Such a person has to have a little time to get his stomach trained into a different condition, so as to get over the stimulation, the excitement, and by carefully pursuing the proper dietary, avoiding meats, for a little while, this difficulty is overcome, especially if he takes pains to eat considerable butter, cream and other things of that kind which cause the stomach to cease making so much fat. And if he takes such food as gluten biscuit, perhaps, gluten gruel, gluten meal and things of that kind which will also absorb the acid without stimulating the stomach. That is the advantage of vegetable proteins over animal proteins—they absorb the acid, so neutralize it, stop this irritation to the stomach and do not stimulate the stomach to make more. But this is a little digression. Cut it off, as I was saying a little while ago, and if I had a grave disease of any sort, I would go right outdoors and live there. In the old days when we used to recommend meat here, to prescribe it for people, we used to have very often persons who were emaciated, feeble, suffering very greatly because of this terrible pain in the stomach. I remember very well a patient who had an awful pain in his stomach, and yet he got so emaciated that he was almost like a shadow. He would hardly make a shadow as he walked along. He looked like the shadow of his former self, as he was. I think he weighed only about 70 lbs. He thought he could not possibly live without beefsteak; but we got him on his feet, and he fatted up, and we sent him home pretty well. He came back again, and I met the man this afternoon in fact; he came running after me as I passed by. I did not happen to notice him but he discovered me. He said, "Doctor, I want to report that I have gained 50 lbs." He was just such a man when he came here, and today he weighs fifty pounds more than when he arrived. He doesn't weigh any more than he ought to now, but he was just a skeleton when he came here. Not a drop of medicine has that man had since he came here. As I said, medicine does not cure; it is the blood that heals; it is the
blood that cures; so it is of the highest importance that we should know the facts about the blood, and that we should have good blood, clean blood, pure blood, and able-bodied blood. That is an exceedingly important thing.

Here is another picture showing some of these large blood-cells magnified so you can see better how they look under the microscope—wonderfully interesting little creatures they are, for they are really creatures. They just travel along through the blood, move about, capturing things, swallowing germs and eating them up as you see the city scavengers going along the gutters and cleaning the gutters, and sweeping the streets,—they perform the very same function in the human body, and are so of great importance. Now, simple living encourages these useful agents in the body more than anything else can. There is a man in London, a Dr. Wright, who has done more than any other man living to make clear to us certain of the functions of these cells which destroy bacteria, and he of these white blood-cells. Metchnikoff, of Paris, and Dr. Wright of London, have done more than anybody else, more than all the rest together.

I said to Dr. Wright, when I visited his laboratory a couple of years ago to see what he was doing, to see at first hand the results of his work, I said, "Dr. Wright, what medicine is there a man can take which will encourage the action of these cells, that will help them to do their work,—what medicine is there?"

"Why," he said, "there isn't any such medicine at all. Every drug that is known, every medicine that is known will diminish their activity and lessen their ability to work." I said to him then, "What drug will poison them, do them more harm than any other?" "Nicotin, nicotin," said the Doctor, and he referred me to a case in which a man had reached a point where these blood-cells, these wonderful cells, these scavengers and germ-destroyers were absolutely able to do nothing at all.

(Dr. Wright made a wonderful discovery. He discovered a method by which he could take a drop of blood from a man's face, put it under the micro-
scope under certain conditions, could study it and find out just what is that man's blood was able to do, just how well it was able to fight tubercular germs; just how well it was able to fight typhoid fever germs, how able-bodied it was in relation to diphtheria and pneumonia germs; and that is what is known as the opsonic index. You have heard about the opsonic index, and that is what it is; and the tuberculo-opsonic index is a number which indicates the percentage of ability of that man's blood compared with healthy blood to fight against tubercle germs. Of course, the normal would be 100. When a man's blood was only half as able to fight as it ought to be, it would be 50. You know I felt rather proud a while ago when I had my blood examined and found it was 200. I felt as though I would like to shout, because when I was a boy I was dedicated to a consumptive's grave, and I had a very good chance to die of consumption. I had two sisters die of consumption, and a number of relatives, and just lived in an atmosphere of consumption, so that it is the greatest wonder to me that I escaped. I don't know how I should have escaped. I was rather a puny boy, and everybody felt sure I would die. I had a cough, and I was really given up to die before I was twenty, so I rather made up my mind I was going to; I was rather expecting it all along through my life until I got my blood examined a while ago and I made up my mind I would die of something else, when my tuberculo-opsonic index was found to be 200, twice above the normal; Now it is an advantage to have a good, high tuberculo-opsonic index. Now Dr. Wright examined a man, published a report of him, whose tuberculo-opsonic index was zero, and he died of tuberculosis in two weeks. In two weeks he was dead of tuberculosis. That man's blood-cells had absolutely laid down, did nothing at all, so the tubercle germs had nothing to do but just swarm in, grow all through his body, and they destroyed him in short order.)
Now, that is what other germs are doing all the time, or would be doing all the time if it were not for the fact that we have these leucocytes at work within us, fighting off the germs, and able to do it. Now, don't you see, then, my friends, that it is a reasonable proposition that anything which will encourage the growth of these cells, and encourage their work, and strengthen them for their work—any such thing is an important thing for us to give attention to; it is a highly important thing for us to consider? Isn't that so? (Anything that will damage the tissue and efficiency of these white cells upon which our very life depends, is a thing we ought very carefully to avoid. Now, nicotine is one of the very worst things possible for a person to take into his body, whether he smokes a pipe, or smokes a cigar, or smokes a cigarette, or chews tobacco, or inhales the smoke which somebody else has cast out, which is really the most disagreeable thing I know of. I think I would rather smoke a cigar at first hand than to have to smoke it at second-hand as so many of us non-smokers are sometimes compelled to do when we have to sit in a sleeping car or in a chair car with a whole lot of smokers in the front end of that car, and the tobacco smoke coming down through the car all the while.) There ought to be a law against that. (Applause.) I am glad to see so many of you have been in that position sufficient to appreciate it, so that you are stirred up upon the subject as well as I am myself. We ought to start a petition I think and get a law in every state to prohibit that. The railroad companies ought to have sense enough, at least, to turn the cars around so the smoker will be at the rear end. Now that we have vestibuled trains, the smoking car ought to be at the extreme rear end. The smoke gets so thick you can cut it with a knife, and the whole car is filled with it. Just think of breathing that nicotine, and weakening the power of resistance! (Then every time the porter comes around with his duster and stirs up the dust, the tubercle germs somebody has deposited there in the car, the porter makes us inhale the germs, so we have the bad nosegay of
tubercle germs; and so we have the bad influences together, the two things together,—the tubercle germs to kill us, and the nicotin to weaken our power of resistance, so that we are more liable to infection than under ordinary circumstances. There ought to be a law against that porter going around with the duster and shaking up the dust. Whenever I see a porter doing that, I get after him and talk to him. No decent, intelligent housekeeper nowadays uses a feather duster, for the feather duster is a relic of antiquity. A moist cloth, or a slightly oily cloth is used, or something which will capture the dust instead of sending it all whirling into the air.) As I said before, it is important to give attention to our white-cells and cultivate them; and we can do it.

The ordinary cold bath will increase the number of white cells in the blood, and ready for work, thirty per cent in thirty minutes. Think what that means. Suppose you haven't got enough. You take a cold bath and you get some more. That is the reason why some of our patients have a cold bath three or four times a day. That is the reason why we recommend you to have a cold bath when you first get up in the morning. It is very important to do that, because if you have that cold spray, or that cold rub, or cold bath of some sort, then you are better prepared for your breakfast. When breakfast comes along, you know there always comes along a lot of germs with it, and you can not help it, because when you take your breakfast down into the stomach, it brings the blood into the stomach and bowels, and the blood is circulated through the walls of the intestines, and it gathers up a great number of those bacteria which are there in the intestine; so they are brought into the blood in great numbers, and that explains why after dinner, after a meal, there are always more of these white cells to be found circulating around than before the meal. Until recently
we did not know the reason, but now we know. They are out there to catch these
gems that are taken in as a consequence of taking the meal, in consequence of
the increased amount of blood from the intestine. (So it is a good thing to take
that cold bath before breakfast. It is a wonderfully good thing to take
a walk out in the open air before breakfast; it is a good thing to sleep in the
fresh, cold air at night, because every breath of it you take down into the lungs
is a cold bath, and we breathe a thousand times an hour. Did you ever stop to
think of it? This cold bath taken into the lungs,—we have 2000 square feet of
lung surface, and the blood is circulating under this 2000 square feet of lung
surface, and when we take a breath of cold air, we get a bath over that 2000 xxx
square feet, and we get a bath of 2000 square feet, if you please. That cold
air is spread out over the 2000 square feet in our lungs, and although it is
a little bath that has only a little cold air with it, a thousand of them an
hour amounts to considerable, you see. A thousand little ones make a big one,
and each one is just a little boost, you see; and a little boost a thousand
times an hour helps a good deal. That is why sleeping in the cold air is so
important.) Don't forget that next winter; and this summer, every night when you
go to bed, throw your windows wide open, and see that your transom is open, so
the air can circulate freely through, so you will get all the fresh air you can;
in the day time get out into the outdoor gymnasium as much as you can. We
have special arrangements up on top of the house for ladies. If you want to
get out into the fresh air and in the day time, and can not get into the out-
door gymnasium, and don't want to trouble especially, let the elevator take you
up, and on the roof there is a special arrangement for ladies where you can have
your outing at any time of day.

Here is something more about the blood. (If we are taking good care
of the blood, we take pains to drink several quarts of water every day so as to keep the blood washed. Take pains to eat plenty of fresh fruits, because there is something in fresh fruit that is necessary for purity of the blood. We need to eat something raw for every meal. I don't mean raw potatoes, raw wheat, raw oats, raw corn or any other food for herbivorous animals, but something raw, fresh, greenstuff like lettuce, fresh lettuce, or the tender, inner heart of cabbage; that is good, and it is raw. There is something in these raw juices that is essential. That is why babies get scurvy when they are fed on sterilized milk, because they need the rawness; and if you are going to feed a baby on sterilized milk, give the baby the juice of one orange every day. If a baby gets the juice of that orange, it will get the raw material it needs, and won't suffer any injury from the sterilized milk. That is a good thing to remember. That is why sailors get scurvy, because they do not get anything raw. It is not because of their salt diet altogether, but lack of raw food; as soon as they get something raw, they get better right away. See what awful things happen to them, ulceration of the gums, teeth falling out, and the whole body falling into decay, rotting alive; yet, as soon as he gets hold of a piece of raw fruit, a few limes, some cabbage—any kind of fresh, raw vegetables or fruits, he gets better. I knew a man who actually saved himself from death by scurvy when all of his companions were dying of it, snowed in out there in the Rocky Mountains one winter for four months. He saved himself from scurvy by digging away the snow and getting the grass buried down underneath, eating the grass; and in that way he saved himself from suffering with scurvy. Then look out for beefsteak. The meat rots, and that portion that is undigested and unabsorbed lies in the intestine, undergoes decay, and rots, and the putrid material absorbed into the blood discourages these living cells to a wonderful extent.

Here is a diagram showing how the blood is circulated. Here is the
heart which is a force pump pumping the blood up into the arteries. The arteries are like a closed tank. Here is a tank full of air. Pump water into that tank, and the air is put under pressure, and the air will force the water out if you have an opening somewhere. Here are a lot of little openings in this tank, and these openings represent the capillaries, if you please, through which the blood passes over into the veins, and these other tanks represent the veins, if you please. Now there is pressure in the closed tank here in the arterial side—there is pressure—just the same amount of pressure as there would be if we had a column of water seven feet high. That is the pressure required to circulate the blood through the arteries. That is required of this circulatory system that we have in our bodies. When you cut an artery the blood spurts. If you tapped a large artery and attached a tube to it, it would raise the blood up seven or eight feet in a glass tube before it would come to a level. This pressure is sufficient to drive the blood through a little opening into the veins. In the veins there is practically no pressure at all—just a very little pressure, and valves all the way along, so the movements of the body and the little pressure here keeps pressing the blood along, forcing it along, until by and by it gets back to the heart.

Now here is something which it may interest you, perhaps, to think of a moment. This blue tank here is as big as the arterial system. This mass of veins here, this tank represents the veins of the abdomen which are so capacious they are able to hold all the blood in the body, so this tank is just as big as that is. Now, the blood-vessels of the skin are capable of holding \(\frac{1}{3}\) of all the blood in the body. The blood-vessels of the muscles are capable of holding half of all the blood in the body. So you see the veins here are more than twice as large as the arteries, and capable of holding more than twice all the blood in the body. Suppose a person's skin is anemic, and the person isiado
bound like a horse that is hidebound sometimes. When a person is hidebound—you know how it is with a bald headed man. (If any of you gentlemen are bald headed, you know the scalp is shiny, and sticks tight to the skull. That is because of the wasting away of the blood-vessels in the scalp. That is the reason why the hair wasted away—because this scalp became hidebound. That is the reason we massage the scalp as well as the hair, to irrigate the roots of the hair by bringing the blood in there and cultivate their growth and development.) (The skin is capable of holding 8 of all the blood in the body. Suppose a man is hidebound his whole body over. We often find such people, that have dry, harsh skins with no blood in them,—pale, colorless, brown, dingy, because of the lack of good, red blood in it to give it proper color. Such a person does not have the blood in the skin that ought to be there, and the consequence is there is too much blood in his head, too much blood in his abdomen, too much blood in his liver, and stomach, spleen and pancreas, and intestines—in all these internal organs. They are congested in other words.) Suppose a person is idle, does not exercise about, then the same thing is true of the muscles; they do not contain the blood they ought to contain. They are capable of holding half of all the blood in the body, but instead, perhaps, they contain only one tenth part of all the blood in the body—only a very little; so the blood is crowded into the abdomen here and the liver is congested. He goes to a doctor and the doctor says, "Your liver is engorged, congested; I must give you some calomel to clear out your portal circulation." Well, when a man takes salts, or calomel, or something of the sort, it drains away the blood in these parts, but it is only temporary, only palliative. The really proper way is to bleed the man, to get the blood out of his internal organs into the skin and the muscles, and that relieves internal congestion. (I was very much astonished
when talking with some medical gentlemen, friends of mine, some time ago, we were talking about pneumonia, and one of them remarked he thought we had made a great deal of progress since we had found out how to treat pneumonia without bleeding; and when it came my turn to speak, I said, "I believe in bleeding in pneumonia; I should not know how to treat pneumonia without bleeding. I bleed every case I treat of pneumonia. For many, many years I have practiced that, for more than thirty years I have been practicing bleeding in pneumonia." The others looked aghast at me. A doctor would be almost turned out of the medical profession if he should go to bleeding as they used to in the old days. I said, "I will explain how I will bleed the man that has got congestion of the lungs. A man that has got pneumonia must be bled. I apply a fomentation to his legs, you see, and bleed him into his legs; then put on a heating compress around his legs so as to make them as red as possible, to make them swell out, fill up with blood; and I keep that pack on there, keep him bled into his legs until the congestion is sufficiently relieved to let the blood back there; so I can bleed him without losing a drop of blood." (That is exactly what almost every chronic invalid that has a dingy, torpid skin, torpid liver needs. He needs to be bled into his skin, into his muscles. The hot baths, and cold baths that bleed the man into the skin, that fill the skin with blood, relieve these internal parts. Exercises out of doors, and in the gymnasium, and massage, manual Swedish movements, and electrical applications—all these all draw the blood out into the peripheral part of the body where it is needed, and so relieves the internal parts.

Here is an interesting thing—some of the small vessels connected with the portal circulation; that connect the blood-vessels with the liver. The blood-vessels which collect the blood from the liver and the spleen, which collect the blood from the stomach, spleen, pancreas and all those internal organs,
is all gathered into one vein and carried to the liver, and here in the liver it passes through a set of capillaries, and finally is gathered up into the vein which is going into the lungs. By this means, the blood in this part of the body is filtered out, passing through the liver, so the germs which are absorbed from the intestine are taken out by the liver, and the poisonous matters which may be taken in the tea, the coffee, and the nicotin which may be absorbed, is in considerable part carried off by the liver; so the body is saved to some extent.

This is a picture of the stomach. Here is the stomach, and these lines you see indicate the directions in which the muscular fibers run. The stomach is a very muscular organ. It contracts. You see the circular fibers in circles here, and the longitudinal fibers lengthwise; and then there are oblique fibers which enable it to contract also; so that we have a variety of contractions in different directions, and the food is made to travel round and round in the stomach, and as it becomes liquid, the liquid part will be brought down to this end, and is forced out. But the stomach has not the position you see it here. It is more this shape. There are lines running out this way; so the food really gravitates down as the liquids pass through. Now, if you have a sound stomach that is making healthy blood, sound digestion, then you have plenty of white blood-cells; and this represents the glands in which the gastric juice is brought down, in these little ducts of the mucous membrane. This represents the pockets. A little piece of mucous membrane is snipped off, and a little piece cut off the edge of it just the thickness of the mucous membrane, and this is turned up and looked at with the microscope; and that is the way it appears when it is looked at.

This shows the little pockets and the little cells which make the gastric juice. Now, when one eats meat, these cells are over-stimulated, and they
they make too much acid; and when one uses mustard, pepper, peppersauce, ginger, and things of that kind that excite and irritate the stomach the stomach is over-stimulated, and by and by, as a result of this over-stimulation, especially from the use of flesh foods and condiments, these glands become worn out; then they disappear, so that the stomach is not able to make any acid at all, and some of you who had the test meal and had the stomach examined, the gastric fluid examined,—some of you found out that you have hypopepsia, or aepsepsia—no hydrochloric acid at all; and you have some inconvenience because of it. Gastric catarrh finally results in this condition. One suffers from hyperpepsia, hyper-acidity, which is, however, excessive secretion, but by and by, as the disease goes on, the stomach loses its power to secrete, and this condition gives way to on in which there is no acid formed at all, no normal secretion. Here is a condition of the stomach showing the effects of over-stimulation.

This was copied from the stomach of a man who had been taking alcohol, and shows what alcohol does in the stomach. It produces these patches here of ulceration, and it is the condition of a man's stomach in the shape of delirium tremens. This represents the liver in its normal condition, and this is the gall-bladder. This is the great strainer that filters out the elements, the germ poisons, and bacteria that are absorbed from the intestine. This is the portal vein that carries the blood into the liver, and enables the liver to do its work.

(Now, the human liver was made for a wholesome, simple, pure diet. The liver of human beings only has one quarter the power of the liver of the dog. The dog's liver has seven times the power of the human liver.) This represents the liver, looking down upon it from above, on the convex surface on top. (The liver has remarkable vitality, has wonderful power. A German physiologist
some little time ago cut off a piece of liver, cut off this piece of it and only left that part there; cut the rest off, in a rabbit. A few months afterwards, he examined that rabbit and found it had grown on a whole new half of liver. So he had just as much liver as he did before. Then he cut off the other half, and a few months later, he made another examination, and he found sure enough, the rabbit had grown on this half also; so the rabbit had a brand new liver. Now, that is what some of you are hankering for, I am sure; at any rate, it is what you need. That is what you are here for, and that is what you are getting. The only way in the world to get anything cured in chronic liver disease is by getting a new liver; and it is possible to have a new liver. The body has this marvelous reconstructive power. It is not every organ that can be grown on. If you cut a finger off, it can not be grown on again; but if you cut off a piece of liver, it will grow on because the liver has such wonderful vitality. There are some other structures of the body that can reproduce themselves. Some glands can be reproduced. (So the whole process of getting well, my friends, is a process of reconstruction; it is being born again, being made over anew; and that is a thing that can be accomplished by right living. Right living is the only thing that will accomplish it. It is only by getting in harmony with the forces of nature, with the creative powers that are working for us, and intelligently directing the processes of repair and reconstruction in our bodies.)

Now this represents the liver of a man that had disease produced by alcohol. It is an alcoholic liver. I am going to tell you now, something that I suppose will surprise you, especially some of my friends from far South, down near the Mexican line, perhaps, that are familiar with red peppers. Prof. Voix, of Paris, has been making a study of this matter, and he has found out that alcohol is not the worst thing for the liver by any means; that pepper has six times the power to make gin liver that gin has. Black pepper will make
gin liver six times as certainly as gin will; that cayenne pepper, and all those things—mustard, pepper, peppersauce and ginger, and all those things that sting, and burn and blister as they go down our throats,—that they are all capable of producing gin liver; and they are more active than gin itself in making gin liver. Prof. Voix made also the discovery that this so-called gin liver is more often the result of dyspepsia than of alcohol, because of the putrefactions that take place in the colon, and especially chronic inactivity of the bowel,—these conditions are more productive of disease of the liver than is alcohol alone. But of course, alcohol combined with other things is still worse.

Here is the gall-bladder—the liver and stomach taken away; and this shows the pancreas which lies behind the stomach; and over here is the spleen, and here are some of the great blood-vessels that abound in these parts, and which when filled with blood contain nearly all the blood in the body; but I see our time is up. I have got another interesting story I will tell you next time. I am going to tell you about cane sugar and the mischief it does. It will take perhaps but two or three minutes to run through this comparison between cane sugar and malt sugar. Malt sugar is the new sugar we use here at the Sanitarium, and we endeavor to get as many people to use it as we can. Malt honey we call it, or maltose. It is natural sugar formed by the action of diastase upon starch, and I recommend all of you to use it in the place of cane sugar. We have used it at our house for many years, and it has a good many advantages; but I will take this up next time, and will tell you then something of the evils of cane sugar, and the mischief it does, and the advantages of this new sugar, this natural sugar which we call Maltose or Malt Honey.
MANUAL SWEDISH MOVEMENTS

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, July 22, 1909, at 8:00 P.M.

by

J. H. Kellogg, M. D.

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I believe I promised the other evening to tell you something about the manual Swedish movements, or the Swedish system of gymnastics. Something more than 100 years ago, a Swedish lieutenant conceived the idea that exercises might be used as a means of cure, and set to work to develop a system of medical gymnastics. He was assisted in his work, probably, by a French translation of a Chinese work on gymnastics which was written about 2000 years ago. I happen to have in my possession a copy of this very interesting book in the original Chinese, sent to me by a friend of mine in Shanghai, and it is really an extremely interesting book. I will perhaps have an opportunity to throw upon the screen some evening some slides made from this book by which you will see that the Chinese really had the original idea from which this system of gymnastics was developed. Now, lieutenant Ling persevered in his efforts in the application of exercises as a means of cure—specific exercises devoted directly to specific purposes, objects, until finally he developed a thoroughly elaborate system which was recognized by the Swedish government; and for many years, for half a century, I believe, there has been carried on a regular educational system in the public schools and in the army of Sweden; and they have what they call the Central Institute, at Stockholm, where officers of the army are all trained.
Every officer of the Swedish army is trained in this system of gymnastics. This system has been exploited in a variety of ways in different countries, and in this country particularly, has been exploited within the last few years under the name of Osteopathy. This system has been well known in for a hundred years, and has been published in Sweden where it is regularly recognized as well as the practice of medicine. There are regular practitioners recognized by the government, who practice this system, and they are to be found everywhere,—at all the watering places and health resorts, and in all the large cities; and the students of the public schools are all trained in harmony with this system. Unquestionably it is the most thoroughly scientific system of exercises which has ever been developed. We have had it in use in this institution more than thirty years. Twenty-six years ago I visited Stockholm to make myself more familiar with the system and study it under the director, Prof. Hartelius, who was at that time the head of the Central Institute, and we have had practitioners here, we have imported from Sweden those who have been especially trained; and we have been carrying on the work here, as I said, for the last thirty years, and we have found it of great use. It is particularly useful in the treatment of diseases of the viscera for the reason that it may be especially directed so as to develop the abdominal muscles. In fact, that is one of the great virtues of this system—that it especially develops the muscles of the trunk, and among civilized people, this is one of the very greatest of the needs.

The sitting position is an unhealthy position. We were never intended to sit. We were intended either to walk, to move about, to stand, or to lie down. Sitting is not a natural position. The chair is not a natural development. The chair is an artificial thing, and the habit of sitting leads to deformities. When we sit we relax. We sit down because we are tired and want to rest, and we relax, and when we relax, we fall into a state of desuetude
so far as the muscles are concerned. The muscles should be tense and contracted so as to make a bow of the back. The muscles of the back are naturally in the shape of a convex curve; the body becomes a bow and the back is the concave surface, and the front of the body is the convex surface. Now, when one gets tired, these muscles of the back relax, and down comes the breast bone; it approaches the pubic bone, the muscles of the abdomen are shortened, the recti muscles are shortened so that there is no longer any tension to hold the internal organs in position. But we will show you a little more about that.

First let us glance at some of the movements. These represent some of the arm movements, movements by which the chest is expanded. This is pulling the chest up. Some years ago we had, about twenty years ago, a poor woman in the institution who was nearly dead. She had heart trouble and had got to the point where it was impossible for her heart to circulate the blood properly, and the breathing had stopped, and the heart was stopping; but by having a strong man stand behind her chair with her sitting in the chair in this way, for two days, we were able to keep this poor woman alive while her husband came from the far west. She had reached the very limit of living, by this artificial respiration. By expanding the chest by raising the arms, it was possible to keep the woman alive for forty-eight hours after she would have been dead.

This shows some of the movements taken in the horizontal position. These are movements applied to the chest and to the abdomen. Here are movements of the legs intended to strengthen the abdominal muscles. They are not intended to strengthen the legs, but the abdominal muscles. These various exercises for the abdominal muscles are of very great value. In these cases, the trunk is held straight, while the arms are flexed, and the body let down into this position and raised again, the trunk being kept perfectly straight all the while. You see, it is necessary for these muscles to be brought into
very strong, vigorous \textit{exercitium} actio. Here are exercises for the abdominal muscles, raising the legs, \textit{et in} to the perpendicular, or raising \textit{ae leg} at a time. These are exercises for strengthening the muscles of the trunk—first to one side, then to the other side when all-round development is required. When a patient had convex curve on this side, for example, curvature \textit{aex} toward the right, exercise would be taken in this way in order to correct that; so a variety of movements are employed for the purpose of correcting the deformities of the trunk which are getting to be more and more common. Here are still other exercises directed to the trunk; here both legs are being raised—capital exercise for the abdominal muscles. Here is a very severe exercise, in which the limbs are fastened to a table, and the trunk is thrown forward, the whole weight of the trunk sustained by these abdominal muscles.

Here is an exercise requiring still greater vigor. The body is raised backward you see, to quite an extent here, and here are still other exercises of similar character, the purpose of which is to strengthen the muscles of the trunk; and as these exercises are practiced day after day, the muscles gradually gain in strength and vigor. There are several thousand of these movements altogether, and it requires long study and a very careful study of the anatomy and a very profound knowledge of the anatomy in order to practice the system correctly. Some of these exercises, fortunately, can be administered by machinery; in fact, some can be administered by machinery more effectively than by hand, particularly the vibratory exercises. It has been found that vibration is a profound physiologic stimulant; it is a very effective physiologic stimulant. Indeed, it can be used in such a way as to be either a sedative or a stimulant. When these are applied over the heart, or a nerve, or any organ of the body, they increase circulation, stimulate the function of the part. A lateral movement or a centrifugal movement applied to the surface has the
effect to draw the blow away from internal parts to the surface, and is sedative in character. By applying these vibratory movements over the heart, it is possible to stimulate a weak heart, so that this has been called the gymnastic digitalis—making these vibratory movements to the heart; and it has been found very effective.

Here is one means of applying exercise to the viscera and the muscles of the trunk. A band is put around the body, and this is put into very rapid alternate motion, giving the trunk a vigorous vibratory movement, and here is the kneading movement. The arms move by excentrics in alternation, and are made to move against the abdomen so that a kneading movement imitating that which may be applied by the hand, but very much more effective, and employing five or six hands instead of one, to the abdomen, and with very excellent results.

Here is a machine which tilts and throws the feet up, and is a vaso-motor gymnastics for the viscera. Here is a vibratory bar. This vibratory bar allows several persons to take hold of it at once, and vibratory movements are communicated from it to the arms, and from the arms to the spine and the head, and other parts of the body. Here is a friction movement to the feet, vibratory movement for the feet. There are various other vibratory apparatus. Here is the hand or dumbbell vibrator by means of which vibrations may be applied to any part of the spine or to the head; and it is found to be a most effective means of relieving pain. Cases which are not relieved otherwise are relieved by this means.

Now these exercises are of special value, as I said, for sedentary persons, persons who live the ordinary, civilized life which is highly perverting and depraving. We acquire a great number of deformities and defects because of our civilized life. The savage man or woman living in the forest subjects his body to all sorts of movements. The body has free play so that it has com-
pleats, symmetrical, all-round development; but the civilized **woman** lives in a harness; he is harnessed up in such a way that it is utterly impossible for her to grow properly and to develop properly. The ordinary case in which a woman grows from the time she is about thirteen, fourteen or fifteen years of age,--the rest of her life, whenever she is dressed, she has a case on, an outside shell, a sort of external skeleton like the mud turtle, and she is allowed to expand the chest so much and no more; she must grow into that particular shape. A modiste said to a New York lady not very long ago, "Madam, your little girl is getting old enough, now, so we must give attention to her figure." She was about thirteen or fourteen years old. She said, "We must begin to mould her figure; otherwise she won't have any proper shape at all."

Now, the idea of the dressmaker is,--in fact, I think of most people nowadays, most women at any rate,--is that the good Lord knew how to make a man but did not know how to make a woman, didn't know just what sort of shape woman ought to have to be really beautiful, to be really healthful and well. So a woman when she gets to be about thirteen or fourteen years of age is put into a mould like a cucumber in a bottle, and made to grow into the shape of that mould. I used to have a cucumber which I had allowed to grow into the form of a square bottle. Now, a woman who lives in a corset has to grow into the shape of that corset in just the same way, and things do not grow in their proper place.

Now, here is a little diagram to show the facts just as we are meeting them, very single day. Here is a figure which is copied from Ziemssen, the great German anatomist, and an authority in anatomy. Ziemssen has given this figure to show how the viscera are related to the skeleton. Here you see the ribs with the flesh removed, and you can see where the stomach is, where the colon is, where the liver is--here is the liver; there is the stomach; here are the lungs; here is the colon, and the kidneys at this point; and at this point,
just under the liver and under the stomach on the other side,—observe that all
these viscera—the colon, the two kidneys, the stomach, the liver, the pancreas,
behind the liver, and the spleen lying just here,—all of these important viscera,
everything except the small intestine and the ascending and descending colon,
are located above the lower border of the ribs, or above the lowermost border of
the ribs. A great many people do not know where these viscera are. A lady
said to me the other day, "O Doctor, I have such an awful pain in my stomach,"
and put her hand down here. I met a doctor some years ago who percussed the
left side of a patient's body and said he thought his liver was all right.
A gentleman some time ago told me he had an awful pain in his appendix, and put
his hand over on the left side. Now here is where the appendix is, right over
here on the right side, at the lower end of the colon.

You see here these important organs I was enumerating, and you notice
how many there are of them—the liver, the stomach, the pancreas, the spleen—
there are four important organs, two kidneys—six; and the colon makes seven—
all of these organs, seven of the important viscera of the trunk are all above
the lower border of the ribs; they are up in this conical portion of the body,
in the upper part of the abdominal cavity. Here is the diaphragm which runs
along here; and here is the aorta; and these organs are right up there at the
top of the room, so to speak,—right up under the vaulted ceiling of the abdominal
cavity. Notice also another thing about this part of the chest; the lower
half of the chest is compressible; and the upper half of the chest—we have the
sternum here and the ribs are pressed up against the sternum and the spine on
the back side; so it is impossible for there to be any great amount of compres-
sion there; but the lower part of the ribs are called the floating ribs, attached
to long cartilages which are very flexible, and joined behind to the spine, so
that they can be compressed until they are almost closed together. In fact,
I have met cases in which these ribs were compressed together so that they overlapped this opening here so that the opening was entirely closed up; and that is the condition in which we find it, more or less, in the majority of women who have worn the ordinary clothing,—never anything tight; you can not find a woman that has ever worn anything tight; a woman will never confess that she has worn anything tight; she does not have to wear things tight; her figure is such shape that she does not require to lace or anything of the sort, none of them will admit it; but this represents the conventional" figure. That is not a diagram, but it is copied from an actual live woman. I have an apparatus by which I can take an outline in any plane in a couple of minutes' time; and this outline shows the shape of a woman who declared she never wore a corset in her life. What is the matter? She said, "I wore a health corset." Of course, a health corset is not a corset! That is an invention of the devil, my friends, to make people think they are good when they are not. This is the actual fact, and you will see just what the position is here. Here my pointer is at the lower border of the ribs, and these organs are mostly below it. On this side, there are seven important organs all above the pointer. On the other side, these organs are all below, at least part of them. Here is the stomach, the liver, and the pancreas, and here is the stomach and colon away down there; two kidneys, the spleen, the heart over here,—those seven organs are all brought below. They have been turned outdoors, they have moved away where they could get a little more room. The compression of the waist here has crowded them down. X

Now, it is impossible to be healthy; it would be impossible for a limb to develop properly, to be active and perform its functions properly when the knee was dislocated. Just think of a leg with a knee or an ankle dislocated. One in such a condition would be very seriously crippled; but I want to say to
you, my friends, a person whose viscera are crowded out of place in this way is
crippled to an enormously greater degree than a person who simply has a dislo-
cated stomach. The last thing before I came in here, I found a woman with her
stomach clear down there; this stomach was actually clear down there, and pro-
lapsed to such a degree it could not empty itself; and it had become distended
until it would hold I should think at least a gallon or a gallon and a half.
And this poor woman has gotten to such a state I am afraid we can not do anything
for her. It is too late I fear. Her limbs are all swollen, and she is in
a state of advanced auto-intoxication because of the retention of poisonous mat-
ters, fermenting, decomposing, putrefying matters in the stomach which has
become so enormously distended and prolapsed.

Now, here we have a picture of the Venus di Milo, that famous Grecian
figure which is considered a model for all the artists of all time since; and
now here is what the fashion maker makes; that is the fashion maker's model,
if you please. Compare these two. Here is a natural waist, and there is
an unnatural waist. When one looks at such a figure as that—of course, you
never see a woman dressed quite as badly as that, but it seems to be the mis-
sion of so large a number of women to attain as nearly as they can to the stand-
ard of the fashion plates. I think such pictures as this are obscene; I think
they ought to be suppressed by law. I think they are mischievous, and that
every fashion plate that is published that creates that kind of a figure and that
sort of a representation of woman, and establishes a wrong ideal in woman's mind,
and puts a wrong conception into the sub-consciousness that leads to a perverted
mode of dress. Now the woman who has the idea that it is elegant to have a
small waist, that it is a mark of real feminine beauty, that such beauty requires
a small waist,—a woman who has that in mind will certainly suppress her growth
and development if she thinks her waist is getting any bigger than the prevailing fashion will permit. So we find women all over the world in civilized lands, compressing the waist. What a senseless thing it is, my friends; what apology can possibly be found for it? You know about the flat headed Indians up in the Northwest—the Indian women there, as you know, compress the babies' heads between two flat boards until they are flattened in front—we think that is a monstrous thing, and it is, to do such a thing as that; and when we hear about how the Chinese mother binds the feet of her little girl until the toes are drawn clear under the feet, and the poor little thing is compelled to hobble along on the tips of her toes, we think how terribly cruel that is; how heathenish that is, but, my friends, the harm done by such deforming processes as that is nothing at all compared with the mischief done by compression of the waist in such a way as to dislocate these important organs upon which our very lives depend.

The idea is prevalent in the world that women should have smaller waists than men; and that is the reason why it is necessary for the waist to be compressed. When a woman finds her waist accumulating a little flesh, that the development is making her waist a little bigger than the fashion plate indicates it ought to be, she is disturbed very much, because she is afraid people will think she has a masculine appearance. I remember a lady who was here some years ago getting her lungs, and chest and trunk developed, and I was showing her how to breathe one day, and she said, "If I take gymnastics, will I breathe like that?" I said, "Certainly you will be able to breathe like that. Take a great, deep breath, and you will be able to expand your chest well." She said, "I will never do it any more then." "Why not?" "Because when I go home people will point their finger at me and say, "Why, she breathes like a man!" What a terrible thing it would be for a girl to breathe like a man!
When I was a medical student at Bellevue Hospital Medical College, I heard Dr. Austin Flint say there were two kinds of respiration; and that was taught by all physiologists; they all taught masculine respiration, and feminine respiration—two types,—that men breathed with the lower part of the chest, and women breathed with the upper part of the chest. I could not see any good reason for that; it seemed to me it was rather an absurd notion; so when I got out of College, I set to work to investigate it. The first thing I did was to study dogs, and I found the masculine dogs and the feminine dogs breathed just alike; and I studied bovines, and I found oxen and cows breathed just alike. So I began making some experiments. I discovered a woman who had never worn a corset—a *rara avis*—and I made an investigation in her case, and found she breathed just like a man; she had never worn a corset. Then I put a corset on a man, and I found he breathed just like a woman with a corset on; and I went a little further, and put a corset on a dog, a great, big Newfoundland dog, and he breathed exactly like a woman that had a corset on. I got into trouble with that experiment, too. It was quite late at night I was making the experiment, and I had a machine that was recording the breathing, a pneumograph; and the dog got away while I was in the midst of the experiment, looking after my apparatus; he sprang out of the window and went home, and I hurried home after him. It was a summer night and the doors were open, and when I got home I found him in my wife's room. *Myxmi* It was my wife's dog, I must confess, and I borrowed him for the occasion. And when I got there he had his paws upon the side of the bed and was waking Mrs. Kellogg up; and just as I got into the room she awoke, and here was the dog with the corset on, and she discovered the plight he was in—whining piteously about it, begging to be let out, and she turned to me with a very reproachful tone of voice,—"How cruel of you to put a corset on this dog." Of course it was cruel, but if that dog had been a
woman, she would have declared it was not tight at all. At any rate, we had that corset off in a hurry, and the dog did not suffer any serious consequences, because he never did it again. I am sure you never could have persuaded that dog to put a corset on again under any circumstances, or allow it to be put on.

But, not content with that, I went out into the Indian Territory, away down to Yuma Arizona, went down to Old Fort Yuma among the Yuma Indians who had never been civilized to the smallest extent; they were still a wild tribe not yet under the control of the government. They had their own reservation there and took care of themselves, and lived in a perfectly natural state. I found the men running about there, and I think those that were in full dress wore what would be equivalent to a pocket handkerchief; and the women in full dress wore little bark aprons about six or eight inches wide and a foot long; and the boys and girls until they were twelve or thirteen or fourteen years of age wore absolutely nothing at all, but simply ran about in the forest there just like squirrels; and they were the finest looking people I ever saw. I took many measurements, and found some very interesting things. There were some good Catholic sisters out there who had started a school, and they became well acquainted with the Indians and were able to introduce them to me, although they were very shy, and I succeeded in getting a number of measurements; and I found the average measurement of those Indian women who had never worn anything about their waists at all, but had grown up in a perfectly natural state—their measurements were exactly those of the Venus di Milo. That was very interesting to me. The Venus di Milo has a waist measurement 47.6% of the height; and I found that was exactly the average of those Indian women. I found one who had exactly those proportions—exactly. A young woman about eighteen years of age had just the proportions of the Venus di Milo. I went
on to San Francisco, got papers from the Chinese consul there, and an interpreter, went down to Chinatown and measured twenty-five or thirty Chinese women, and I found the very same thing with them. They breathed like men, and they had waists of the proportion of the Venus di Milo. I went down to Mexico and found the native women there, and afterwards went to Cairo and Egypt and studied the native women there from the upper Nile, women who had always lived in a natural way and never worn anything tight, and I found the very same thing there. I found among the French peasantry in France where I studied the question among the peasantry, and the peasantry of other nationalities,—Spain, Germany, Austria, Denmark, and in what they call the black country of England, and I found the working women who had had a fair chance to grow and develop had large waists.

I made another study that brought out something that was curious to me. I measured a lot of men, and I found the average proportion of men was a little less than that of these natural women,—45 and a fraction instead of 47 and a fraction. The waist measurement of men in proportion to their height was about 2% less than women. In other words, the women had larger waists than the men. That seemed monstrous. I made a study of a lot of ancient Grecian models; I got into Tiffany's, New York, got them to allow me to examine a lot of plaster casts of a lot of famous statues, and in visiting the Roux in Paris, and in visiting Rome, I got an opportunity to examine and measure a large number of the ancient masterpieces; and I found the average waist measurement of seven men, including the Apollo Belvidere, was 45 and a fraction instead of 47 and a fraction. So the men had smaller waists in proportion to the height than the women. Some time afterwards, I got hold of the results of some work done by Buffum, of Germany, and a number of other specialists in anatomy, and I found that was their observation—the observation made by German anatomists—that
that women had larger viscera than men. They did not find they had larger waists than men, because the women practiced tight lacing; but they found that the women had larger livers than men. Woman has a larger liver than man has—has a smaller heart and more liver—more liver and less heart. That is interesting, isn’t it? She needs more liver, and she doesn’t need so much heart. Why? Because the heart is proportionate to the size of the fist; the heart is always the size of the fist. Look at your fist, and you can see the size of your heart. It requires a large heart to back up the fist a large fist. A small heart requires a small fist only because the heart is a muscular organ intended to back up the muscular organs of the body; so a small fist, a small arm, small muscles necessitate a small heart; require only a small heart. The muscular power of women is just half that of men, and the heart is smaller. But when it comes to these viscera, these organs which make blood and supply vitality to the body, it is a different thing. The liver of woman is larger in proportion to her size than in man. We have the best anatomists in the world as the authority for that. A man woman’s stomach is larger in proportion to her size than a man’s. Woman has larger kidneys than man, a larger spleen, a larger pancreas, and she has a larger colon. All of these large organs, these viscera are larger in women than in men. Why? Why, because sometimes in women the duties of motherhood require that these organs should do work for two, so they must be larger. It is of necessity that they must be larger, because the woman, the mother with her child is larger than the man, you see. At any rate, she has larger nutritive requirements; the amount of food required to feed the mother and her child is larger than that required to feed a man of the same size; so she must have a larger capacity for the nutritive functions. Now, my friends, what a monstrous thing it is, then, when the organs located in this region of any woman are naturally larger than those in
man, and requiring more room,—what a monstrous thing it is to propagate the idea that the woman requires and naturally has a smaller waist than man. See what a monstrous thing that is and what evils grow out of it—the establishing of this wrong ideal in that the world, that a woman must have a small waist to be beautiful. This idea has caused an immense deal of damage.

Here is an original, natural figure—not really a natural figure, but this diagram was designed as it ought to be. I will show you a real figure shortly, and you will see it looks better.

This is the correct standing position, and this is the wrong standing position. This is a good standing position, but on account of this high heel, extra strain is brought upon the muscles of the body in this region, so that harm is done to the interior of the body; but now here are two figures that show you the natural figure, and an unnatural one, and you will be surprised when I tell you that these two figures are the very same person. About twenty years ago, this young woman came to the institution with that figure. She was a school teacher and had acquired that figure by her habit of sitting and wearing tight bands to support the clothing about the waist. These habits had produced this monstrous deformity of the lower part of the abdomen. I am not overstating things when I tell you that nine tenths of all women who reach thirty years of age and have worn the conventional dress have this deformity more or less, have this waist furrow, and prolapsed viscera in the lower part of the body. This young woman was put through a course of gymnastics and training, and in a year's time was herself a teacher of physical culture, and had this beautiful figure you see here. She was an entirely different person, had a different expression on her face, and was a woman leading a vigorous, active, useful life; and she has gone on from that time, a perfectly well and healthy woman.
I am going to show you here a few figures of actual facts, not diagrams, but actual facts of how terribly the viscera becomes displaced, how the colon becomes displaced, for example. Here is the colon going right straight across here; and this compression of the waist and **Retention of contents in the colon**, causes it to become distended or overstretched, you see; and it prolapses clear down here into the pelvis, becomes enormously elongated. How can it possibly help but suffer intoxication? There is no possibility of avoiding it. Here is another case here, enlargement of the cecum, so that the colon becomes filled with putrefying materials, food remnants, and the whole body is saturated with the poisons in consequence.

This shows a natural position so far as the viscera are concerned. This is the natural position especially of the colon, but here is an interesting operation that has been devised for the purpose of curing some of these conditions. Dr. Arbuthnot Lane, one of the leading surgeons of London, a few years ago, finding many patients suffering from intestinal auto-intoxication,—it occurred to him that the difficulty might be remedied by leaving the colon out and by attacking the small intestine to the colon here; so he ligated the small intestine and attached the small intestine at this point, on the other side, you see, near the outlet of the colon, and the idea was that by this means he would prevent the accumulation of putrescible foodstuffs in the colon, and so would prevent disease, and he succeeded. He has operated upon forty or fifty people, and in a large number of instances, these patients were wonderfully helped. Some years ago the Doctor kindly sent me a copy of his paper on the subject, and I performed the operation myself, and with remarkable results. I had a patient whose bowels had never moved naturally in her life-time, a lady over forty years of age, and she had a grown-up daughter with her. The daughter had
a very fine, fair, clear skin, and the complexion, and the mother's skin was the color of leather. I performed this operation you see here, and the bowels moved three times the next day, and continued to move regularly naturally, and in six weeks, the skin was clear, so that she had almost as good a complexion as her daughter; and now for three years she has been enjoying good health. The difficulty sometimes returns, however, from the backing up of material into the colon. Dr. Lane, finding this difficulty, has modified his operation, and now instead of making this anastomosis, as it is called, connecting the small intestine to the large intestine, he cuts the colon all out, removes the whole thing down to there, and with good results. Sometimes the patients die, but I think about nineteen out of twenty of his patients live. Metchnikoff has called attention to the fact that the animals that have the longest lives have the shortest colons; so his theory is that a long colon is the cause of a short life. And he suggests that we have already begun to remedy this state of things by removing the appendix, and that we might just as well advantageously, perhaps, continue along in the same course, removing the colon; and Dr. Lane, before Prof. Metchnikoff had made this suggestion, was already removing the colon for the cure of autointoxication. Metchnikoff has shown that this autointoxication is the cause of premature old age and most chronic disease; that it is the cause of hardening of the arteries, and of apoplexy--maladies which are getting to be extremely common; and sometimes it seems perfectly consistent for Dr. Lane to remove the colon, and if there were not any alternative, it certainly would be the proper thing to do. I thought at one time that I should be doing that operation quite frequently for certain cases, like chronic old dyspeptics, persons whose colons were considerably crippled, but I have not yet found a case in which it was necessary; and I have not yet found another case in which I thought it was necessary to repeat that operation I told you I did
three or four years ago for a lady; because the same results can be secured in another way. Here is another deformity outlined—the cecum lying right down upon the rectum. Such a person would suffer terribly from this inconvenience. The patient's bowels would be thoroughly evacuated, but the patient would not be at all relieved; he would feel as thought the bowels were still full. Why? Because this cecum lying upon the rectum produces a sensation of a necessity for evacuation of the bowels when the bowel has been emptied. We meet that state of things frequently.

Here is a cake in the center of the enlarged intestine, and a fold here causes obstruction so the matters are held back, and the colon is continually more and more filled and further distended. Here we have further deformity, you see—not only a fold in the center, but an enormous elongation of the sigmoid flexure of the colon—not an uncommon state of things,—and when this condition of things occurs, there are big kinks at these folds, and they sometimes become twisted in this way, and actual obstruction occurs. Those cases are not infrequent.

I see our time is up, it is nine o'clock, but as I began to say, I have not yet found it necessary to do the operation I described a moment ago. None of these operations are necessary, for the reason that we are able to relieve this difficulty by correcting the dietary. When a person is suffering from auto-intoxication as a result of putrefaction,—we want something pleasant to look at for a moment, certainly something better than what we have been looking at (a picture of flowers),—when a person is suffering from auto-intoxication the result of the putrefaction of food remnants in the intestine, there are several things which can be done besides removing the colon, and which had better be done, because they can be done all the time and continuously,
without running any risk of losing the life or suffering any injury. The first thing to be done is to stop eating things which will putrefy. Stop putting into the alimentary canal things which putrefy. Some things putrefy and others do not. If you go into a room and you find an odor of putrefaction in the room, somewhere, you do not say, "Oh, somebody has left a piece of bread here", or, "somebody has dropped an apple or a peach here." You don't say, "Well, now, it must be that someone has left a rose or a flower of some other sort here." No, you know better. Those things will not putrefy. You say, "There is a dead rat here somewhere," and you hunt around to find that dead rat.

Now, a dead rat is simply flesh, it is simply a piece of flesh. It might be a dead cat, or it might be a piece of dead cow, or a dead sheep; it does not make any difference what kind of a dead animal it is; it is flesh that is decomposing; it is decomposing flesh; that is the reason why there is this odor—because the decomposing flesh gives rise to aromatic substances, poisons which are extremely volatile and extremely unpleasant odors, indol, skatol, and other substances of that kind.

Now, what happens outside the body can happen inside the body. Anything that can undergo putrefaction outside the body can undergo putrefaction inside the body. The very same thing can happen inside of us as may happen outside of us. The beefsteak that will undergo putrefaction in your pocket will undergo putrefaction a great deal more rapidly inside of you, in the stomach or in the colon if allowed to lie about in there, in the ways we have been seeing that all these things are liable to do in persons who live the civilized life. It is not so bad with the savage, because his functions are normal. Every time the savage eats, his bowels move, so nothing remains in the alimentary canal more than a few hours, not more than eight or ten hours any way, because the bowels are active; but civilized man has gotten into perverse habits, and decomposing foodstuffs lie about in the colon for days and days, two or three
weeks sometimes; and the consequence is poisons are absorbed in enormous quantity, and we have the evidence of it in the malodorous perspiration that no amount of handkerchief perfume will cover up; in the dingy skin that can only be very imperfectly hidden by cosmetics of various sorts, in the malodorous breath, in the foul tongue, in the putrid bowel discharges,—these are all evidences of putrefaction which is going on in the body which is absolutely unnatural. Why, my friends, there is no reason that anybody can give why the foodstuffs which go into the mouth so sweet and clean and pure,—why they should not leave the body just as clean and just as sweet; and it is so in a normal state. Now, the bowel discharges of an infant, of a perfectly healthy infant being fed upon mother’s milk; because the bowel discharges of a thoroughly well, healthy infant, can be placed in a bottle and put away, and will not putrefy. That is a scientific fact; I am not presenting this to you as a random statement, but as a scientific fact, that there is nothing there to cause putrefaction. It is absolutely free from putrefactive germs, and this is true of animals that live in a normal state. One professor made a study of the bowel discharges of northern animals at Spitzbergen, and he found 50% of them were absolutely free from germs—nothing there to make this foulness and putridity. That is the way it ought to be with human beings. But because we infect our alimentary canals with putrefactive organisms, and because we swallow into our bodies things never intended to go there, substances capable of undergoing putrefaction that would be absolutely incredible and and unspeakably offensive to us if they were remaining outside of the body—because we take those things into our bodies and allow them to undergo these same putrefactive processes—-it is because of that that human life is being so rapidly shortened, and that we have come to be deteriorating so rapidly at the present time that our lunatic asylums are swarming with inmates; that deformities of every description and degeneracy of every sort is increasing at a tremendously rapid rate from year to year.
Now, the first thing, then, is to stop eating putrefying material; and the second thing is to see that the bowels move with sufficient activity so that there will not be time for putrefaction; and the third thing is to eat foods which will not putrefy, and which will discourage putrefaction; and there are such foods. Starchy foods, sweet foods, acid foods, fat foods, farinaceous foods of all sorts hinder putrefaction, because they produce in the intestine ferments which are unfavorable to the putrefying process. Then, we might antagonize the putrefaction by antitoxic ferments, and Metchnikoff, of Paris, has discovered a very interesting and effective one. An old fashioned one that everybody knows about is buttermilk. Buttermilk is an antitoxic food. When buttermilk is taken into the body, it produces changes there, sets up a kind of ferment which is perfectly wholesome and which makes putrefaction impossible; and Metchnikoff has found a buttermilk in Bulgaria which is more effective, better than ordinary buttermilk, because it is capable of living in the colon. Ordinary buttermilk can live only in the small intestine, but in the colon is where the most trouble is; but the Bacillus Bulgaricus, as it is called, will live in the colon, and that was really a very precious discovery. Metchnikoff has investigated the matter very thoroughly, and Harter, of New York, has investigated it; Combe, of Lausanne, and a large number of others have studied it; and we have been making studies of it here in our laboratories for the last two years, and it is found to be capable of preventing putrefaction. Next Monday night I will bring up a pan of yogurt buttermilk in which is a beefsteak that was put there one year ago last June, and it is just as sweet today as it was when it was put in, in fact, a little sweeter. Our folks celebrated its first anniversary last June, and it is still sweet. That is not a discovery of mine at all. I was talking with Mr. George Kennan about that, and I thought it was a rather interesting observation, but I was talking with
Mr. George Kennan, who was a patient here some time ago, and he told me that in the Caucasus, where he spent a whole year in the interior, delving among the mountains there in hidden places where no European had ever gone before him,—Mr. George Kennan told me it is a common thing there among these people and among the Tartars to preserve their meat by putting it in buttermilk. They submerge it in buttermilk and so preserve it from day to day. In that hot country, it undergoes putrefaction very quickly, and that is the way they have to preserve it. So it is common knowledge to them over there. This buttermilk has been used by the people of those countries for many centuries, going away back probably to the time of the patriarchs, and one can see it must have been of great service to them there, and we find the oldest people in the world today in that region—Bulgaria, Roumania, and Mesoopotamia, and in Hungary. Not long ago I saw a despatch in a paper from Hungary stating that a man and his wife, an aged couple, had recently celebrated the 100th anniversary of their wedding day. The man was 120 years old and his wife 118, and they celebrated their 100th anniversary, and the government had granted them a pension, and they were still living in very good health.

So you see, my friends, that this question of exercise is one of very great practical importance. For a person suffering from auto-intoxication, it is necessary, first of all, to correct the diet, as I have been telling you; then to develop these abdominal muscles so that the viscera will be lifted up into place so that they can perform their natural functions regularly, and until they can do that, it is necessary for them to be helped; so we have yogurt that we give in various ways; we have Colax and Colaxin and other things which are necessary, and the various sorts of enemas that are employed, and they must be used assiduously and systematically, not only for a few days or a few weeks, but for months, until the body is thoroughly cleared out of these poisons which
for years have been accumulating, so that the kidneys and the liver may be relieved of the terrible burden they have been carrying in eliminating these poisons and have an opportunity to recover their normal functions.

I have been talking to you about a rather melancholy subject, and I hope you won't dream about it, but think of these flowers when you go to bed.

Every afternoon at three o'clock the sunshine club meets here in the parlor, and I am sure some of you would be glad to come in and get cheered up if you are feeling moody or despondent. If you have a chance to get into the outdoor gymnasium, I would not advise you to miss that opportunity, because I think there is more sunshine outside than we can possibly make inside. But get into the sunshine class and get cheered up and helped, if you have a fit of the blues.

I am going to talk to you a little while tomorrow night about Christian Science and similar cults, the truth and the error in Christian Science, and the true mode of healing; that is, divine healing. I thank you for your attention.

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SUGAR

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, July 29, 1909, at 8:00 P. M.

by

J. H. Kellogg, M. D.

I am going to talk to you tonight about sugar, which is a very sweet subject. It is really a very important subject, because it is a subject upon which there is a great amount of error, and the people have been taught for a long time that there is nothing quite so good to eat nor quite so wholesome as sugar. The sugar trust have certainly been very actively propagating the idea that there is nothing so good as sugar—trust sugar; that it is the most nourishing of all foods, the most crowded full of energy, and the best calculated to support work and labor; and some experiments were made some years ago by the German government which are constantly cited as evidence of the truth of this statement. But I am going to tell you tonight something of the truth about it on the other side.

It was found out a long time ago that candy is harmful. The wise and careful mother years and years ago discovered that candy was not good for her babies; that candies were not good for children; that somehow children's teeth seemed to decay rapidly when they made great use of candy, and that somehow they had attacks of indigestion of various sorts. But the reason why was not understood from a scientific standpoint, so it was very easy for the public to be misled by the random and reckless statements that were made with reference to the great value of sugar as a food.
Now, as a matter of fact, sugar is not a food at all; sugar is not a food. An animal fed on sugar would die just as certainly as though it were fed nothing at all. An animal that was fed on sugar alone would just as certainly die as though it received no food whatever, because sugar is not a food. It is a food principle. Now, there is a great deal of difference between a food principle and food. A brick is not a house, but brick is building material. Brick and mortar and iron and wood and stone and various things put together in the proper way will build a house, but a brick is not a house, and a pile of brick would not be a house. One could not get any comfort from a pile of brick on a cold day no matter how many brick he had, if it was simply a pile of brick; but a lot of brick arranged in the form of a house, associated with other material and built into a house, would be a very comfortable shelter on a cold day, or on a hot day either for that matter, perhaps. So it is with sugar. Sugar is a food principle just as brick is building material. Sugar is a material which may enter into food and may constitute a part of food. For example, foods are composed practically of four things: of protein, which is the material which goes to make muscles and nerves; of fats, material which forms adipose tissue—oil and fat of the body—we know what that is; and of carbohydrates. Now, carbohydrates are of different kinds. There is starch which is one form of carbohydrate; there are fruit acids, organic acids of fruit, as the acid of the lemon; and fruits give us another kind of carbohydrates—dextrines of various sorts, and gums—they are carbohydrates; then there are sugars which also are carbohydrates.

There are various kinds of sugars: fruit sugars—the sugars found in raisins and other fruits of all kinds; then there is milk sugar which is found in milk of all sorts, milk of all animals, for there is a little sugar in the milk of all animals. Then there is cane sugar, and there is malt sugar. So
we have fruit sugar, milk sugar, malt sugar and cane sugar. Now, malt sugar is the sugar which is formed by the action of diastase of malt upon starch—ordinary malt converted into fruit sugar and the sugar is afterwards fermented and made into beer. A similar diastase is found in the pancreatic juice and in the saliva. In the body it converts the starch into maltose in the same way; so maltose is a natural sugar formed naturally in the body. We eat about a pound of starch a day when we live on an antitoxic diet, and that pound of starch is all converted into sugar—one pound of sugar, and this is natural sugar. You can eat a pound of starch without its producing any irritation, because this pound of starch, when it is digested, is converted into maltose, which is a non-irritating sugar, a natural sugar for the body. The same is true of fruit sugar. The sugar of honey is non-irritating, fruit sugar, because it is found in flowers and fruits. The sugar of milk is non-irritating, because it is found in milk which is a natural product. But cane sugar is an irritating sugar; it is an unnatural sugar, for it is found in foods which are not calculated for human beings. It is a grass sugar, contrasted with maltose which is a grain sugar; with lactose which is a milk sugar; with the fructose, or fruit sugar which is produced in fruits; so you see there are three natural sugars which are perfectly harmless and perfectly amiable in their action to the human body. Contrasted with these, we have cane sugar which is a grass sugar. It is found in grasses of all sorts, in the stems and leaves of the green plant; it is found in the sweet corn; it is found in sorghum, in the sugar cane; it is found in some few fruits like the date; but when it is found in the date, it seems to be almost a mistake, because most dates do not contain cane sugar to any considerable extent. There are only a few varieties of the date which contain any large amount of cane sugar. In the normal date, the cane sugar is converted into fruit sugar,—inverted and converted into fruit sugar in the process
of ripening; but there are certain dates in which this process seems to be lacking, and they contain cane sugar.

As I said, cane sugar is an unnatural sugar. It is found in the sap of the hickory tree, and the maple tree, and in other trees; it is found in the sap of corn, grasses and grass plants of various sorts none of which are foods for human beings; but those things which are natural foods for human beings—fruits of various sorts, and products of the industry of the bee, honey, and the sugar of milk, and the maltose or the malt sugar which is formed within the body itself,—these are all natural and wholesome sugars which do no harm, produce no irritation.

I am going to rapidly review the process of digestion here. I have already mentioned three of the food elements found in the body—the proteins, fats, and the carbohydrates, which compose the starch, dextrin and sugar, and the fruit acids; then fourth, we have salts. There are certain indigestible elements of foods which we do not need to consider here. Now there are five digestive organs which digest these living principles of foods. Here are the salivary glands. These secrete saliva which converts starch into maltose. We call it Maltose in order to have a trade name for it as it is used on our table, and you find it mentioned as Maltose on our bills of fare,—or as Malt Honey. This is maltose which has been made by the diastase of malt acting upon the starch of grains. The salivary glands secrete diastase which converts the starch into maltose in the mouth. That is why a crust of bread gets so sweet after you have chewed it a long time—because it is converted into sugar. If you take pains to chew the food well, the saliva keeps acting on the food after it has gone into the stomach. The stomach makes gastric juice which is produced in these little follicles here. Here are some of these little follicles which make the gastric juice and pour it out into the cavity of the stomach, and
it acts on the protein. The liver makes bile and stores it up into the gall-bladder, and it is poured down into the small intestine, and that digests fats. The pancreas lies behind the stomach, and it forms a secretion which is poured into the intestine a few inches below the stomach; and the pancreatic juice digests protein, starch and also fats. These three elements are all digested— the starch, the protein or albumin, and the fats are all digested by this one digestive fluid which is produced by the pancreas—the pancreatic juice.

Now, we have accounted for the digestion of all the food elements but the sugar. The sugar has not been accounted for as yet. You see, the sugar is found in the food, and it passes the saliva and nothing is done to it; it passes through the mouth, gets down into the stomach, and nothing happens to it. The bile comes in contact with it, but nothing happens to the cane sugar. You can not utilize it unless it has first been digested. If cane sugar is injected into the blood, it is all excreted into the kidneys just exactly as it was swallowed. No change has been made in it. It passes on down into the small intestine, goes on down and through, and by and by it comes in contact with a substance in the mucous membrane of the small intestine which converts that cane sugar into fruit sugar; and the only way we can ever make any use of cane sugar is by its being converted in the process of digestion into fruit sugar; so you see, if we eat fruit sugar in the first place it is already digested; but if we take cane sugar, it must be digested before we can utilize it. In the meantime, the cane sugar acts upon the stomach and irritates it, because it has been found to be very irritating. Prof. Brandl, an eminent German chemist, found that a 10% solution of cane sugar caused a dog's stomach to become very red, just like a blood-shot eye; and a 20% solution—one ounce of cane sugar to five parts of water—when that was applied to the stomach, it caused it to become so intensely inflamed and caused the dog so much pain he ha
had to stop the experiment. That is what happens to you when you eat a lot of candy. These little boys here ought to remember that, when you are eating a lot of candy—when you are eating gum drops, sticks of candy, chocolates or any sort of candy, or a big lump of maple sugar or any other form of cane sugar, or syrup; when you take a quantity of any of those things into your stomach it irritates the stomach. If you want to make sure as little harm as possible is done, whenever you eat anything of that kind you should drink a tumblerful of water for every stick of candy. For every four chocolates you ought to swallow a quart of water at least to dilute the sugar so it won't hurt the stomach. I have seen a great many candy eating children, and I notice they always have pale faces, and that is because their stomachs are so irritated they are not able to digest or assimilate the food properly; so they are suffering from anemia in consequence of it. I have met many people who were sick, perhaps suffering from gastric catarrh, because of injury done to the stomach by eating candy or sugar in some other form.

When food is eaten it enters the stomach at the upper or cardiac end, and moves around in the first part of the stomach for some little time, and the saliva which has been swallowed with the food is all the time working upon the starch converting it into sugar; so if you eat a pound of starch in the course of a day you have eaten a pound of sugar, don't you see, and you don't need to eat any more sugar. When one eats a couple of ounces of oatmeal for breakfast, it is almost all converted into sugar, yet some people are so ignorant they will put a couple heaping tablespoonsfuls of sugar right on that oatmeal. That is like carrying coals to Newcastle, don't you see?—it is heaping sugar upon sugar, for the oatmeal will all be converted into sugar down in the stomach. As fast as the sugar is formed from the starch that has been swallowed into the stomach, it passes over to the opposite, or pyloric end of the stomach; then
the muscles of the stomach contract, the pylorus opens, and the sugar is forced out in solution, and down into the intestine. That is the way the process of digestion is carried on. These internal organs are all supplied with large blood-vessels, and these blood-vessels become enormously distended when the stomach becomes irritated so often, as by the presence of cane sugar, and it becomes irritated more and more until by and by ulceration occurs; and the free use of cane sugar is unquestionably, in my mind, one of the causes of hyperacidity of the stomach; so-called acid dyspepsia which does not mean fermentation at all although gas is formed in the stomach sometimes in enormous quantities. This is not because fermentation takes place, but because an excess of acid is produced and the stomach becomes irritated.

The candy habit is getting to be something prodigious in this country. There are people who are actually candy inebriates. A little time ago there was a lady patient here who had a dreadfully bad stomach, and we could not imagine, at first, what was the matter; but when visiting her one day I found in her room several five-pound boxes of peppermint lozenges. I said, "For Pity's sake, what do you do with these?" "Oh," she said, "I always have them, and I have them made specially, double strength, for me." I said, "What do you intend to do with all these five-pound boxes of peppermints?" She says, "Eat them." "Eat them! I thought perhaps you were going to distribute them among your friends. I thought maybe you were going to let me have some of them, perhaps confiscate them, carry them off." "Oh, no," she said, "I eat a five-pound box full every week." Almost a pound a day of those intensely irritating peppermints--of this irritating mass of sugar and peppermint--this woman was going to swallow in her stomach almost a pound a day of them. It is no wonder she had gastric catarrh of a very bad sort, and it is no wonder she was so wretched. Her husband
ran off and left her, and she had an awful time. So you see the bad effects that come of candy eating. It may be very, very sweet food, but it turns sour after while.

Somebody asks how about jellies and preserves? Of course, anything that has cane sugar in it, whether it is in the form of candy—most candies nowadays, I think, are comparatively pure; high priced candies, I think, can be depended upon to be pure cane sugar; but pure cane sugar is just as irritating as the other kind—as the glucose, or any of the rest of them, and one form of cane sugar damages the stomach as much as another form. Jellies and preserves, and other sweet foods, sweet cakes, and sugar used upon the food, syrups upon breakfast cakes, and all sorts of sweets when obtained from the sugar cane, and canned fruit that is very much sweetened, candy, syrup and these things are all unwholesome. They have a bad effect upon the liver. We have a picture here labeled gin liver, but it might just as well be labeled candy liver, because an excess of candy overworks or embarrasses the liver. Nearly every particle of sugar that is taken into the stomach is absorbed by the stomach and intestines, and carried in the circulation to the liver, and it must be passed through the liver. It is the duty of the liver to capture this sugar and hold it up in itself, and then dole it out to the body in small doses as the body is able to bear it. But when one takes a great deal of sugar, the liver is overworked, and some of it slips by, just like a great crowd of people crowding upon the gate, the doorway, and some of them get pushed through because the doorkeeper can not keep them out. We have a condition called beer drinker's kidney, but this might just as well be called a sugar eater's kidney, because the sugar which is taken in in too large quantities is recognized in the blood by the kidneys, and the kidneys strain it out, and the kidneys are irritated. Cane sugar is an irritating substance. It irritates the stomach and irritates the liver when it
it comes in contact with them; it irritates the kidneys when it comes in contact with them; so the whole body is embarrassed by this irritating substance.

Dr. Bishop of New York, has called attention to the fact that cane sugar is extremely pernicious for persons suffering from high blood-pressure. It damages and irritates the kidneys and the blood-vessels as well; so if there is Bright's disease, this is one of the worst things possible for a person to eat. The injury to the kidneys doubtless has something to do with producing diabetes. I remember very well a gentleman who came here some years ago as a patient. I first met him here 34 years ago this summer. He was a prominent man in a western state, and I found him very nervous. He got better, but he came back year after year. He was a smoker, and when he went home he relapsed and went to smoking again. Then he would come back the next year for a while, and when he went home went back to smoking again; then come again another year, and relapse again after returning home. So he kept coming back year after year until he had spent seven years in this institution to be cured of smoking and his improper habits of eating. I remonstrated with him once for eating so much sugar. I said, "I am afraid you will get diabetes." He said, "Oh, no, there is nothing the matter with me except my nerves; that is all." He said, "There is nothing the matter with my stomach or liver; they are all right." By and by, about twelve years ago, this gentleman came, and we made an examination, and, sure enough, he had diabetes. I said to him then, "Now, you must stop the use of sugar." He said, "Oh, Doctor, I can't stop the use of sugar."

"But you must stop it. You will die. You have got diabetes now, and the next thing will be Bright's disease." He would not stop. He stopped a little while, but when he went home he went back to his old habits again, and the next year he came back with his diabetes worse, and Bright's disease added to it; and in spite of all we could do, in three months he went home and died, for we
could not help him; it was too late. He had gone too far.

Now there is no doubt but there is an immense deal of mischief comes from the use of cane sugar. It is called a food, but, as a matter of fact, it is not a food; it is a drug. Cane sugar is a drug and not a food. It is true it may be utilized in the body along with other food substances; it is not a whole food nor a proper food, and it is not capable of building up and nourishing the body when taken alone by itself. It produces certain irritating and injurious effects. It seems to me, indeed, it ought to be called a drug, or at least a drug-food if it should be called a food at all. So I recommend everybody to the disuse of cane sugar as much as possible.

But we were talking about the digestive organs. The pancreas has something to do with the use of sugar also in the body—with the oxidizing of sugar; and it seems to have a bad effect in some cases upon the pancreas. This important gland sometimes becomes diseased. I want to call your attention to the contrast between cane sugar and Maltose, a natural sugar. Maltose, or Malt Honey, is maltose in solution, maltose prepared in a palatable and usable form. I think we were the first to accomplish that. Maltose is the sugar which is found in ordinary malt extracts, such as Trommer's extract of malt, or any syrupy extract of malt. They all contain maltose, but there is a bitter principle associated with the maltose which renders it very unpalatable. After years of experimentation, and after the expenditure of probably twelve or fifteen thousand dollars, we finally succeeded in learning how to carry on this process of digestion so as to convert the sugar into maltose without the presence of that bitter and disagreeable principle which renders the use of these malt extracts so impossible as a food substance. I began some thirty years ago trying to use these malt extracts as a food. I tried to get my patients to take them in place of cane sugar, as I recognized the evil of cane sugar, but, finding
this impossible, I set to work about seventeen or eighteen years ago, established a laboratory, set a man at work there, and kept working at it for months and months, and even for years, until finally we succeeded in producing a preparation which we call Malt Honey. Similar preparations are being made in New York and some other places at the present time, though they are not quite so good as our Malt Honey.

Now, let us see the contrasts between these two: Cane sugar is not well adapted to human nutrition, because it is intended for cows have a stomach which makes a ferment which is especially adapted to converting cane sugar into fruit sugar. Cows have a stomach to digest cane sugar with, while human beings have no cane sugar stomach. Maltose is naturally and perfectly adapted for human nutrition. Cane sugar injected into the blood is not utilized, but carried out by the kidneys the same as any other poison would be; whereas maltose, or Maltose, injected into the blood disappears, is absorbed in the blood itself and utilized, so is not carried off as waste matter. It is treated as a native and wholesome substance for the body.

2. Cane sugar is found in coarse roots and grasses and the sap of trees. The food of herbivorous animals. Maltose is always produced in the stomach and intestines after a meal containing starch. It is a natural sugar, you see, produced from starch in the body itself; so the body makes maltose, whereas the body does not make cane sugar; it must digest it before it can utilize it.

3. Cane sugar is digested only after much delay and sometimes not at all, and not assimilated when absorbed without digestion. Maltose is easily and promptly converted into fruit-sugar by intestinal digestion. May be absorbed
and utilized without intestinal digestion. So if the intestine is ever so
diseased, if the digestion is ever so bad, Malt Momey or Meltose when taken
into the stomach is entirely absorbed, entirely utilized; whereas the same will
not be true of cane sugar. It may be true or may not be true. Hyposeptics
have very little power to digest cane sugar. The power to digest cane sugar
may be absent entirely. There are many persons of adult age who have not the
power to digest cane sugar, and can not use cane sugar even in very small quan-
tities without great trouble and suffering.

4. Cane sugar is an irritant to the gastric mucous membrane. Meltose
does not cause irritation. Now, gay experiments were made upon this subject
in the German army, and it was found that it was impossible to give a soldier
more than two ounces of sugar without producing mischief. It was thought that
the use of sugar would increase the capacity for work, but it is found that when
sugar was used in larger quantity than two ounces—Moseo made this observation,—
it was found that more than two ounces actually produced a decrease in work.
Many people eat more sugar than that in a day. I have seen people take, I
should think, two ounces at a meal. It decreases the capacity for work. Prof.
Peré, of Paris, made some experiments which seem to indicate that cane sugar
does not increase power to work as a food substance, but only as a stimulating
inv substance, through stimulating the gustatory nerves, and only while the
sugar was in the mouth, and while the sweet taste was being experienced that that
sort of stimulant effect was exercised upon the body which increases the power
to work. But, as a matter of fact, sugar as a food substance did not increase
the power to work at all.

5. Cane sugar gives rise to gastric catarrh, provokes acidity and
other forms of indigestion. Meltose may be eaten more freely than any other
sugar and without harmful results. Cane sugar produces this irritation to such a degree and so constantly that there are many people who can not eat even a small amount of cane sugar or any other kind of food containing cane sugar, without experiencing unpleasant effects. Is there anybody here who has noticed in their experience that they can't eat cane sugar without getting some unpleasant effects, or is there anybody here who is personally acquainted with persons who have had this experience? I see a dozen hands raised; and that is a very common thing. A lady told me the other day that her husband could not eat cane sugar without experiencing great distress, but he was able to eat malt honey without any difficulty at all. I had a letter not so very long ago from an eminent eastern scientist engaged in studies of food. He has charge of a large eastern laboratory, one of the largest in the world, for the special study of nutrition. He said he found he was able to eat malt honey, although he could not eat a small amount of cane sugar, or maple syrup or anything of that sort without great distress; so he keeps himself supplied with Sanitarium malt honey, Chocolates, and other of our foods so he can indulge his sweet tooth without any embarrassment.

6. Cane sugar is highly detrimental in diabetes, arteriosclerosis, and many other maladies. Malt honey may be used in various conditions in which cane sugar is highly injurious. It can be used in moderation even in diabetes, and it is not objectionable in arteriosclerosis in which the blood-pressure is high, when used in moderate quantity.

7. Cane sugar contains no lime or bone-building salts, and is condemned by eminent authorities as a cause of rickets and bone deformities. Maltose contains lime and organic bone-building salts and does not cause rickets and deformities.

Prof. Sherman of Columbia University called the attention of the world
to this important fact some two or three years ago in a lecture given before the Lake Placid Club, at Lake Placid. I have a copy of the lecture and it is a very important document, so important that I republished it. He calls attention to the fact that in using carbohydrates as we find them in nature—if, for instance, we use sugar as we find it in fruits, if we take the sugar as we find it in starch, carbohydrates, in the form of cereals, the sugar is always associated with the necessary salts, because we take the sugar in connection with other food principles, and we have a full assortment of them all associated together, and properly arranged in proportion when we take them in the form in which nature produces them. So we have not only sugar, but with the sugar the salts necessary to be associated with it to nourish and other parts of the body. If we eat starch in the form of cereals, the salts are right there with the starch; but when we take cane sugar, there is nothing but the pure sugar. The cane sugar has been separated out by a process of crystallization; the sap has been expressed from the cane, and the sugar has been crystallized out of it, and the salts are all carried away in the waste liquor, you see, that has been discarded.

Maltose, on the other hand, represents all the soluble principles of the grain associated together; the sugar and the salts are all there, and are not separated, because it is not crystalline sugar.

SUGGESTIONS FOR THE USE OF MALTOSE.

Maltose may be eaten in any quantity from one or two tablespoonfuls to four or six ounces. I prescribed a tumblerful of malt honey every day, for one man today. That might produce a rather laxative effect, for it is laxative somewhat, and that is one of its advantages—but in three doses, divided between the meals, and associated with a little butter, or fat, or oil of some sort, or cream, it is one of the most fattening of all substances, because it
will all be absorbed. A single ounce of malt honey represents about 86 calories—a little less than 100 calories of food value. Three of the malt honey tablets, or health candy, as it is called, will be 100 calories. Malt honey may be eaten as freely as bread, as it is simply digested bread, or represents at least the digested carbohydrates of the bread and the soluble salts of the grain. In the use of Meltose as a food for the relief of emaciation and weakness, it may be eaten in quantity of three to six ounces daily. This quantity should be taken in addition to the ordinary meals. If the sweet taste of Meltose is objectionable, add a spoonful of lemon juice, or the juice of some other acid fruit. It may be eaten with the meal or at the close of the meal. It may be eaten upon wheat flakes, or rice or corn flakes, or combined with other cereals. It does no harm to combine it with any cereal, because it is itself a digested cereal. It may be eaten upon bread and butter, or in any way in which ordinary syrup or honey is used. It may be combined with fruit juices of various sorts. It lends itself readily to a great variety of preparations in which sugars are ordinarily employed. Meltose readily lends itself to table use. It is a perfect substitute for syrups of all sorts. Its delicate flavor combines well with fruits of all kinds, and also lends itself very readily to the preparation of a great number of tasty desserts and various wholesome confections.

A very excellent method of using Meltose is as a dressing for acid fruits, such as peaches, blackberries, strawberries, sliced apples and other fruits, in place of sugar. Several varieties of chocolates and toothsome caramels are prepared from Meltose by our confectionary department. It makes excellent taffy and other candies. With syphon water, Meltose makes a delicious "mead". Sarsaparilla, strawberry, raspberry, or any desired flavor may be added.
Now, I have told you the story about sugar, and I hope you will profit by it. Begin to practice on it tomorrow morning when you sit down at the breakfast table. Instead of helping yourself freely from the sugar bowl, or from the little pitcher of sugar brought to your plate, call for some malt honey, and you can find on the bill of fare the quantity that is served. If you want to get fat, that is a very good way to increase your fat. You can add malt honey knowing that every particle of malt honey you eat will be absorbed at once, because it is all digested and ready for immediate assimilation.

I want to say just one word to call your attention to two little booklets here which I hope you will be interested in,—a little book on Health Education by Correspondence is one. Patients are constantly saying to us, "What am I going to do when I get home?" This little book tells you what to do when you get home. Here is a copy of Good Health, our health journal, which is the mouthpiece of the Sanitarium. This journal has been published now for more than thirty years. For 36 years I have myself had the pleasure of getting out every monthly number of this journal, and I have been living up to these principles as well as I knew how, and I think that is what has enabled me to do it. Thirty-six years without getting out of service is a pretty good record, and I hope to be able to get out several numbers more. You see on the cover the picture of a little girl. This little girl has never tasted flesh in her life, and never will. Her mother was raised according to Battle Creek Sanitarium principles, grew up in fact, in the family of Mrs. Kellogg and myself. We raised her in our family, but I give Mrs. Kellogg all the credit of making a fine woman out of her, as far as anybody can have any credit; and it is her daughter, and a charming girl she is—thoroughly healthy and well, never had a sick day in her life, now some three or four years old, and a remarkably bright and healthy child.
I was up today to the Bethesda Home, a rescue home that we have in the country out here about a mile, and I found there half a dozen of the sweetest little babies you ever saw in your life, raised on the Sanitarium diet. They are being brought up in harmony with the principles of the simple life. And you want, I hope, my friends, to carry these principles home with you. This booklet, "Health Education by Correspondence", tells you how to do it. If you want any further information with reference to it, call for Miss Thompson or Miss Tenney. Miss Tenney is always on hand at the cooking school. She is there giving private lessons, instruction in cookery to any of our ladies who want to carry these methods home with them. You don't expect to cook at home yourself, probably, although it is the biggest fun in the world to cook. I don't know anything so much fun as to take crude materials, make them into something delicious and inviting. My mother taught me to cook when I was twelve years old. I had the pleasure of getting up every morning in my life when I was twelve years old, and getting breakfast. That is what first interested me in dietetics; and I began from that time to study dietetics, and I think that is what gave me a start in that direction. When I was twelve or fourteen years old, I began the more serious study of health principles and dietetics, and began to practice certain principles which I have followed ever since. Tomorrow night I will tell you about that, and we will have an experience meeting, and Dr. Read and a dozen others will tell you their experiences with these principles. Everybody come.

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